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# Explore the world of
# Danfoss fluid conveyance

From thermoplastic hose to data center connections,
Danfoss has the hose, fittings and connectors that work.

## Connectors

### Product Categories:

- Brass Connectors
- Flexmaster
- FLOCS
- Quick Disconnect Couplings
- Steel Adapters
- Swivels
- Tube Fittings

## Fuel, air conditioning, thermoplastic & specialty (FACTS)

### Product Categories:

- A/C & Refrigeration
- Airbrake
- Beverage Tubing
- Engine/Fuel
- Performance Products
- PTFE
- Railway
- Silicone
- Socketless
- Specialty
- Subsea Oil & Gas
- Thermoplastic



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## Industrial hose

### Product Categories:

- Air & Multipurpose
- Chemical
- Food & Beverage
- Material Handling
- Oil & Petroleum
- Specialty
- Steam
- Water

## Rubber hydraulic hose & fittings (RHHF)

### Product Categories:

- Braided Hose & Fittings
- Spiral Hose & Fittings
- Tools, Machines & Accessories



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# Hose selection worksheet

Danfoss recommends using the STAMPED process to aid in determining the correct hose and coupling for your application. This worksheet is designed to help you organize information for determining the best hose for a given application. The questions are based on the hose selection factors described in this guide.

When selecting a hose, always use this worksheet in conjunction with this guide. Read all instructions concerning the hose you are selecting. If any questions arise contact Danfoss technical support at 1-888-258-0222.

## STAMPED

- **S - Size** (I.D., O.D. and length)
- **T - Temperature** of material conveyed and environmental
- **A - Application,** the conditions of use
- **M - Material** being conveyed, type and concentration
- **P - Pressure** to which the assembly will be exposed
- **E - Ends;** style, type, orientation, attachment methods, etc.
- **D - Delivery** testing, quality, packaging, and delivery requirements

If you have any questions, please contact Danfoss Technical Support at 1-888-258-0222.

### 1. Size

Flow (cubic feet per minute) requirements? _____

See RMA Water Discharge table.

Hose I.D. requirements given the flow requirements? _____

Pressure drop? _____

Length requirements (excluding hose ends)? _____

### 2. Temperature

Temperature range of material to be transferred?
Min. _____ Max. _____ Average _____

Year-round external environment temperature range? _____

Cleaning temperature?
_____

### 3. Application

If the application is new, what service is to be performed?

_____
_____
_____
_____

### 4. Material: Compatibility & Environment

Internal and external environment consideration. Internal environment relates to the material being conveyed. External environment relates to anything originating from outside the hose.

Check all that apply.

- ☐ Abrasive materials (conveyants and external)
- ☐ Petroleum products (aromatics, aliphatics, etc)
- ☐ Materials that could cut or gouge hose
- ☐ Solvents
- ☐ Cleaning with steam
- ☐ Ozone
- ☐ Acids/caustics
- ☐ Animal fats (oils)
- ☐ Sparking or flames

Material to be transferred? _____

Material concentration (%)? _____

What hose cleaning solution(s) will be used? _____



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## 5. Pressure & Suction

What working pressure is required? _____

Are pressure surges involved in this application? How high? _____

What safety factor is required? _____

Is this a suction application? What vacuum rating is required? _____

## 6. Ends

End _____

Material _____

Attachment Method _____

## 7. Delivery

Qty. required _____ Date required_____ Pkg. requirements_____

Testing Required - ☐ No ☐ Yes If Yes, Type: _____

Certification Required - ☐ No ☐ Yes If Yes, Type: _____

## Special Requirement/Other Information

Will the selected hose need to possess any of the following features:

Branding information needed on the hose? _____

Color coding? _____

Any special designations required by agencies or associations? _____

Will any regulatory agency approvals be required? If yes, which one(s)? _____

Non-conductive rubber needed to prevent transmittal of electricity? _____

Static wire or static-dissipating tube to prevent static electricity buildup and discharge sparks? _____

Pin-pricked cover to resist blistering when transferring hot materials or air/gases under pressure? _____

Abrasion sleeve or guard? _____

Heat shield? _____

Sub-zero exposure resistance? _____

Special assembly requirements? _____

Continuous transfer service or intermittent service? _____

Flexibility: Do space restrictions exist where the hose will be used? _____

Bend Radius: of the hose relative to space in which hose will be used? _____

Considering the intended use of the hose, how flexible will it need to be (check one)?

☐ Extremely flexible ☐ Slightly flexible ☐ Not an issue

Weight: How will the hose be handled during use, if all? _____

How important is the weight of the hose going to be in this application (check one)?

☐ Very important ☐ Slightly important ☐ Not an issue



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Danfoss testing facilities

# Danfoss **Tech Center**

## Where innovation and technology meet

### Application engineering

A Product Applications Engineer is responsible for performing a wide variety of engineering and technical tasks. They review all customer product specifications, including drawings, contracts, and project details. They are the main technical resources throughout the sales process. The Product Applications Engineer identifies and designs complex products and solutions, determining manufacturing feasibility and costs for specific customer applications and quotations.

### Engineering lab

The Engineering Lab is a place of learning and discovery for our technical team. This area includes our current crimp machine line up where we can build test samples and prove out new products and tooling on our crimp equipment. It also includes two of our 3D printers that we use for rapid prototypes, proving designs and developing new methods of manufacturing components. There is also space to perform product tear downs, review and analysis as well as machining capabilities for custom tooling, fixtures and cutaways.

### Environmental room

Fluid Conveyance Products are exposed to many harsh environments and we need to be able to duplicate some of these conditions. Environmental chambers are machines we use to simulate extreme temperature, humidity, vibration, flexing and pressurization conditions. The environmental room is filled with six environmental chambers with varying capabilities. While all the chambers can be programmed with a high/low temperature profile, two of the chambers have vibration capabilities, one has a mechanical flex capability and two have humidity capabilities. Environmental testing is performed to either industry specifications, customer specifications or internally developed test protocols. As an added feature, a power unit can be brought to the chambers to perform impulse testing while at varying environmental conditions.

### Hydraulics lab

Our ISO/TS 16949 approved and A2LA certified Test Lab provides a suitable environment to conduct laboratory testing in support of new product development, ongoing customer support and internal continuous improvement activities. Our staff includes experienced Technicians, Hydraulics Systems experts, Electrical expertise, LabView expertise, in house Gauging and Calibration, Quality and Maintenance. We are fully capable of designing and developing all our test equipment from simple test fixtures to complex impulse machines.

### Impulse lab

The machines within this area are designed to perform the core hose tests of impulse and burst. Impulse testing is a fatigue test where hose is repeatedly exposed to high pressure pulses for a high number of cycles while at its highest operating temperature and smallest bend radius. These extreme conditions ensure hoses meet endurance requirements. Burst is a one time pressure test where hose is taken to failure and required to meet a 4 to 1 safety factor. Other testing that takes place in this area includes vibration, tensile, volumetric expansion and air brake flex testing. While not as common as burst and impulse, these tests are needed to support the vast array of industries that the Fluid Conveyance product lines serve.

### Material science lab

The Maumee Materials Science laboratory offers the formulation development of novel thermoset and thermoplastic elastomers alongside expertise in testing, chemical compatibility and QC analysis.

### Oven room

The ovens that occupy most of this room's floor space are utilized for a variety of high temperature tests including high temperature aging, hot oil circulation, high temperature impulse and high temperature burst. Testing to these protocols ensures our products will perform even when run at their extreme rated operating temperatures.

Abrasion to a hose cover will expose the steel reinforcement wires causing corrosion and eventually hose failure. The Fluid Conveyance product group offers a variety of hose covers from entry level low abrasion resistance to premium products that offer very high abrasion resistance. To characterize the abrasion resistance of a hose cover, we use an abrasion tester designed to run testing per ISO-6945.

Salt spray is another standardized test protocol run in this room to test plating corrosion resistance. Plating is a significant factor for Fluid Conveyance because most of our fitting and adapter product lines are Zinc plated steel.

### Pilot plant

The Maumee Pilot Plant generates prototype hose based on engineering specifications and used in the Concept Assessment and Design Suitability stages of development.



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# Danfoss term **glossary**

## Danfoss brand definitions

### Aeroquip®

Premium brand hose

### AQP™ High-Temp

Used exclusively for Aeroquip high-temp hose; constructed with patented elastomer materials.

### Bruiser®

Ultra-**abrasion** resistant hose cover; 100x greater abraison resistance than the ISO 6945 industry standard

### Dura-Kote®

Plating technology offering three times the **corrosion protection** on carbon steel fittings, compared to competitive hose fittings – up to 1000 hours of corrosion protection. Used on premium fitting series such as 1A, Z and 4S/6S series.

### Dura-Pulse®

A patented **inner-tube** compound providing five times longer life than standard 2SC hoses. It is slow to age and has a low compression set, which provides better sealing and leak free performance.

### Dura-Seal™

Patented innovation that eliminates the hose assembly **cool-down leakage**, while extending hose assembly life and reducing equipment downtime.

### Dura-Tuff®

Premium **abrasion**-resistant hose cover; marketed as 8x greater than the ISO 6945 industry standard

### Dynamax®

Ultra-performance, premium hose offering **high pressure capabilities** with extended life and 50% better **bend radius** than EN standard.

### Hi-Pac®

Special braided hose construction type. FC310 and FC510 are examples. Additional wire is added into the braided reinforcement to allow for higher pressures. Mining hose.

### Lifesense®

A monitoring system that detects impending hydraulic hose failure and alerts operators and maintenance crews so they can schedule maintenance and plan downtime. The system continuously monitors hose condition via electrical signals and generates an alert when the hose starts to experience internal fatigue.

### MatchMate®

System that matches hose to fittings.

Braided-Match number of rings (O) on layline with number of rings on fitting

Spiral-Match either 4S or 6S on layline with corresponding mark on fitting

Braided & Spiral-Match hose dash size with size on fitting

### ORS®

Specialized fitting that provides an o-ring seal at the face of the fitting designed to eliminate leaks in high pressure systems.

### Winner™

Standard tier brand hose & fittings

### X-Flex®

Spiral hose offering 50% of SAE R13/R15 **bend radius** in demanding **high impulse** applications

## Fitting definitions

### 1A Aeroquip fitting series (TTC)

Aeroquip one-piece fitting series' name for core, braided hose products. It corresponds with the printing on both the hose layline and fitting. "Through the cover" (TTC) is a legacy series' name. Suitable for use on premium and standard products.

### 1G fitting series (OTC)

Premium series' name for "over-the-cover" (OTC) style fitting.

### 1R/2R reusable fitting series

Premium reusable fitting series' name for one and two-wire braided hose products. Suitable for use on premium and standard products.

### 1W fitting series

Premium internal skive, two-piece fitting series' name for select core spiral hoses used to achieve a higher level of performance. Suitable for use on premium and standard products.

### 4S/6S fitting series

Premium one-piece fitting series' name for core spiral hose products. Suitable for use on premium and standard products.

### STC® (snap to connect) series

High pressure fitting series' that makes hose line connection quick and easy, without the need for assembly tools.

### Winner one-piece fitting series

Standard tier fitting series. Does not use dura-kote plating technology. Suitable for use on standard products and selectively on premium products.

### Winner two-piece fitting series

Non-skive standard tier fitting series. Does not use Dura-Kote plating technology. Suitable for use on standard products and selectively on premium products.



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## Industry terms

### Crimp fittings

A term used to describe non-reusable fitting component parts or complete assemblies for braided and spiral hoses. Core series are: 1S, 1A, 1B, 1G, 4S and 6S.

### Field attachable fitting

A fitting designed to be attached to a hose without crimping or swaging. This fitting is not always a reusable type fitting.

### Hose fittings

A device attached to the end of the hose to facilitate connection. "Hose-end" and "coupling" are equivalent terms in the industry.

### Maximum working pressure

The maximum pressure for which the hose assembly is designed. Note: "operating pressure" is an equivalent term but should not be used in copy.

### Nipple

The portion of the fitting that goes directly into the inner diameter of the inner tube of the hose. It extends out of the hose and into the connecting end. Also known in the industry as a "stem" or "insert".

### Non-skive

Refers to hose and fitting combinations that does not require removing part of the hydraulic hose cover and/or inner tube prior to attaching fittings. Also known in the industry as "no-skive".

### Socket

The portion of a fitting that is compressed by crimping to seal the hose onto the fitting barbs and create a permanent attachment. Also known as "collar" and "ferrule" in the industry.

## Key fluid conveyance terms

### One wire braided hose

Hose series reinforced with a single steel braid

### Two wire braided hose

Hose series reinforced with two steel braids

### Four wire spiral hose

Hose series reinforced with four wires

### Six wire spiral hose

Hose Series reinforced with six wires

### Abrasion hose

Defines the level of abrasion-resistance a cover offers. Danfoss has three levels: standard, premium (Dura-Tuff) and ultra (Bruiser)

### High-temp hose

Danfoss' designated term for premium core products with a max temperature rating of at least 150°C (300°F).

### Low-temp hose

Danfoss' designated term for premium core products with a max temperature rating of at least -57°C (-70°F).

### Premium tier

Products that **exceed** industry specifications. For Danfoss, distinctions from standard tier are made with abrasion resistance, temperature range, impulse cycles and ISO 18752 rating.

### Standard tier

Products that **meet** industry specifications.

### Specialty hose

Active products that tend to be used for more niche applications.



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# Danfoss **PowerSource™**

## Your information headquarters

## Putting fluid conveyance information at your **fingertips.**

**Danfoss PowerSource™ is the hub for all of Fluid Conveyance. This informational site houses Danfoss's product, market and technical information including:**

1. Searchable fluid conveyance product information:
   - Part numbers
   - Sizes
   - Performance and specifications
   - Branding information
2. Literature and videos
3. Product value propositions
4. Crimp specifications
5. Competitor cross reference tool
6. Coupling cross reference tool
7. Custom bin label tool
8. 2D/3D cad models
9. Hose assembly configurator
10. Marketplace (authenticated PowerSource only)
11. List prices and lead times (authenticated PowerSource only)

To access these tools and more, visit and log in to PowerSource from Danfosspowersource.com and then select tools.



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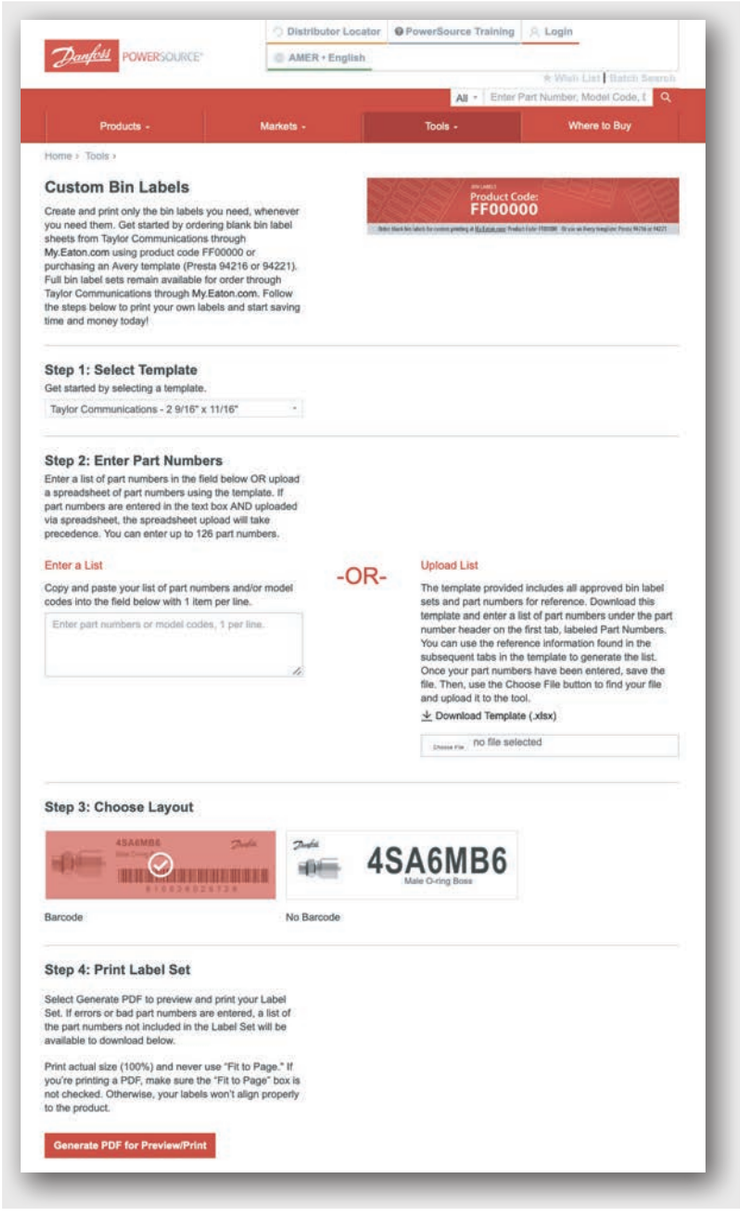


# Custom **bin labels**

## Get your custom bin labels today!

Danfoss has created a solution for all your instant bin label needs from the convenience of your office in just four simple steps.

1. **Select template**
   Choose the template.
2. **Enter part numbers**
   Enter part numbers OR upload your own file of part numbers.
3. **Choose the layout**
   Configure label with or without barcode.
4. **Print label set**
   Generate a PDF to preview and print your label set.

For best results use the product code FF00000, available through Taylor Communications. Individual labels are 2 9/16" x 11/16".

This custom bin label web solution can be found at: Danfosspowersource.com > PowerSource > Tools > Custom Bin Labels



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# Standard and premium fittings - **the right product for every application**

**Braided or spiral, premium or standard, there is a Danfoss fitting designed for your application.**

| Braided Hose Fittings | Features: |
|---|---|
| **Premium**<br>1A Series<br> | • **Dura-Kote™** plating technology for up to 1,000 hours of corrosion resistance<br>• Bite the wire technology for best in class connection and sealing<br>• Class zero leakage SAE J1176 on approved hose styles<br>• Over 550 1A Series part numbers available<br>• Danfoss' **MatchMate®** program provides identification markings on the hose, hose fittings, and crimp dies for quick and easy assembly |
| **Standard**<br>Two-piece Winner<br> | • Non-skive, two-piece crimp fitting<br>• One nipple part number for EC115, EC215 and EC118 standard hoses<br>• Meets industry specifications when used with the EC115, EC215 and EC118 standard hoses<br>• Clear silver hexavalent chromium-free plating<br>• Carbon steel material |
| **Spiral Hose Fittings** | **Features:** |
| **Premium**<br>4S/6S Spiral Series<br> | • **Dura-Kote** plating technology for up to 1,000 hours of corrosion resistance<br>• Danfoss patent-pending **Dura-Seal™** technology eliminates hose assembly cool-down leakage<br>• Class zero leakage SAE J1176 on approved hose styles<br>• Danfoss' **MatchMate** spiral-hose/fitting identification system program provides identification markings on the hose, hose fittings, and crimp dies for quick and easy assembly |
| **Premium**<br>1W Internal Skive Spiral Series<br> | • Internal Skive Hi-Performance Spiral Fitting with design-related sockets<br>• Blow-off prevention for critical applications<br>• Designed to withstand high-pressure environments, with a capacity of up to working 500 bar (7250 psi).<br>• Tested to two million flex impulse cycles, proving their durability and reliability over the long-term.<br>• Class 0 Cool Down Leakage per SAE J1176<br>• Double O-Ring **Dura-Seal™** for sizes -20 to -32 providing extra protection and durability for large size hoses. |
| **Reusable Hose Fittings** | **Features:** |
| **Premium**<br>Reusable Series<br> | • **Dura-Kote** plating technology for up to 1,000 hours of corrosion resistance<br>• Engineered to provide peak performance with Danfoss' core braided hose products<br>• Can be assembled in the field without special tooling<br>• Reduced downtime<br>• Quick repair |



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# Dura-Kote and Dura-Seal technology **extends the life of your hose assembly**

**3X** Carbon Steel Corrosion Protection

**Dura-Kote Plating Technology**

Hose fittings that will now offer 3x the corrosion protection on carbon steel fittings as compared to competitive hose fittings. Danfoss' Dura-Kote fittings provide up to 1000 hours of corrosion protection. This is a huge step forward in metal fitting corrosion protection. (Only on 1A Series and 4S/6S fittings)

4S/6S Fitting

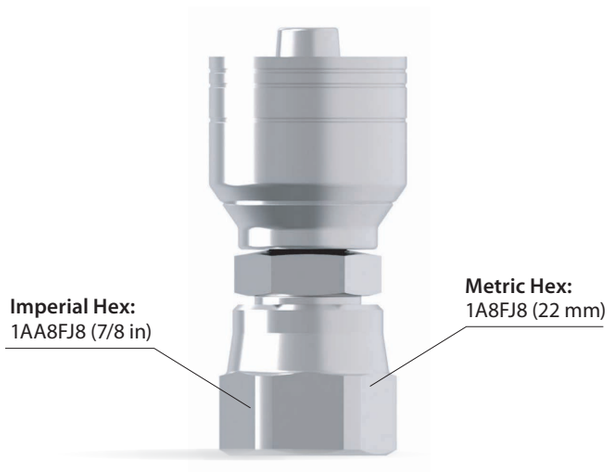
**Class 0** Cool-Down Leakage Protection

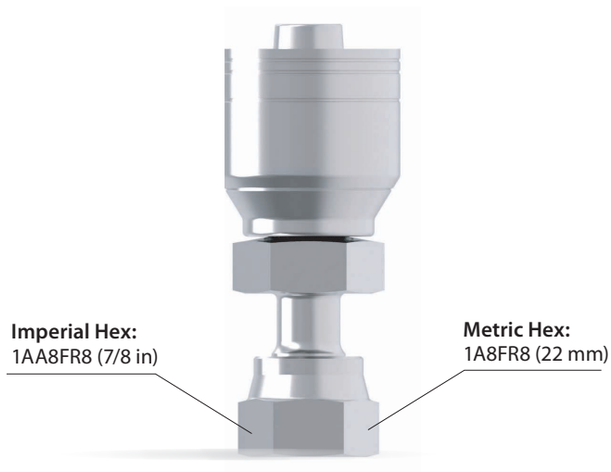
**Dura-Seal™ Technology**

This patent-pending innovation from Danfoss eliminates hose assembly cool-down leakage, while extending hose assembly life, reducing equipment down-time. (Only on 4S/6S fittings)

# Need **Metric?**

Danfoss has the answer.




## Available metric fitting configurations*:

• JIC • ORS • Many Imperial FJ and FR fittings have a metric equivalent

*Danfoss metric fittings are not listed in this catalog, please contact customer service for more information.



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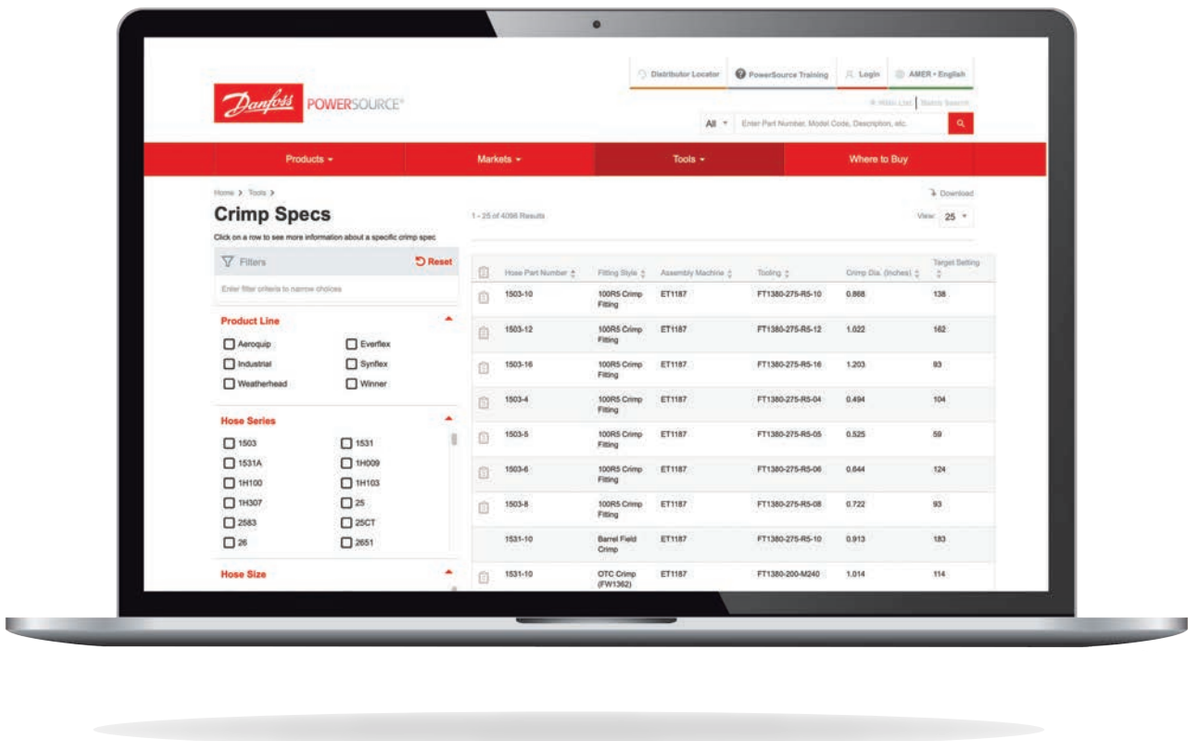
# Crimp specs **in a flash!**

**Find your crimp specs quickly and easily with the PowerSource Crimp Spec tool. You can create a custom crimp chart from your desktop following these simple steps.**




| 1. Go to PowerSource | 2. Enter criteria | 3. Download |
|---|---|---|
| Visit Crimp Specs at danfoss.com/crimp | Select your crimp spec criteria. This includes Assembly Machine(s), Product Line, Hose Series, Hose Size, and Fitting Style. | Locate the download icon at the top right of the screen and select either the PDF or Excel option to generate your custom chart.<br><br>*Excel format allows you to perform custom sorting, filter data, remove unneeded fields, and to add custom notes and color coding. |



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# Crimp specs **on the go!**

**Danfoss's mobile crimp spec tool provides a four-step guided selection process for quick access to crimp specs on your mobile device.**

## It's as easy as:

Visit PowerSource Crimp specs at danfoss.com/crimp on your mobile device

- Find your machine
- Select your hose series
- Select your hose size
- Find your fitting style

## Get results, fast!

You can even bookmark the crimp spec page and add it as an app on the home screen of your mobile device for easy access at any time!

**For iOS,** open the webpage in Safari, click the boxed arrow icon at the bottom of the screen, and select the plus sign icon "Add to Home Screen."

**For Android,** open the webpage, click the three vertical dots on the top right hand corner, and select "Add to Home Screen."



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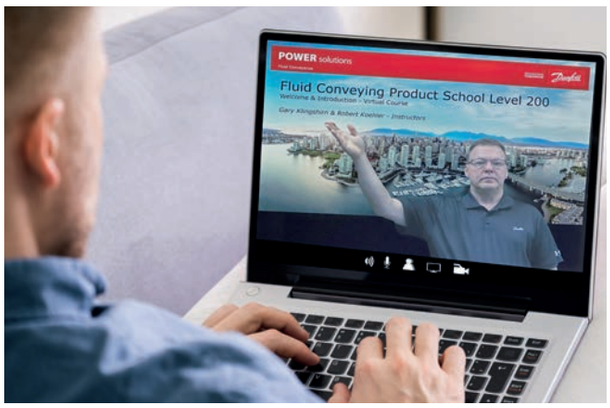
# Knowledge is power, **invest in your career!**

**Danfoss' Fluid Conveyance training (virtual and face-to-face options available)**




Virtual

Face-to-face

Master Danfoss's core fluid conveyance products and more with the help of our training team! Danfoss offers in depth, formal training courses designed to make you an expert in the field.

Attend Danfoss's 200 Level Fluid Conveying Products School to learn more about general product and application information or Danfoss' 300 and 400 Level Fluid Conveying Products Specialist School for a class focused on more technical information as well as competitive advantage materials.

Check out https://www.danfoss.com/en-us/service-and-support/training/dps-learning-and-training-solutions/ for specific product courses and dates. If these locations and dates do not work for you, our experts can come to you. Contact hydraulicstraining@Danfoss.com for further details.

Danfoss Hydraulics Training Center
1650 Indian Wood Circle
Maumee, OH 43537
Phone toll free: 1-800-413-8809
Fax: (952) 906-3731

HydraulicsTraining@Danfoss.com



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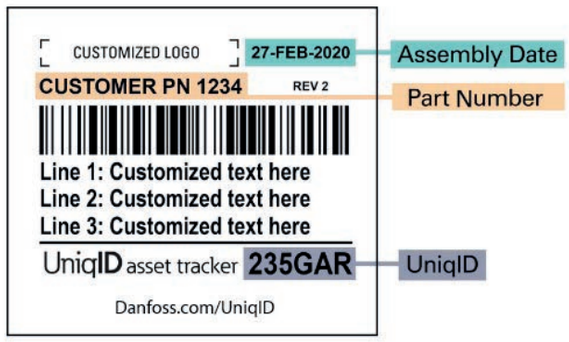
# UniqID™ Asset Tracker

## Small label. Big Impact.

The Danfoss UniqID asset management solution seamlessly drives new efficiencies into every aspect of the asset lifecycle—from asset tracking, to routinized maintenance alerts, replacement orders and more. Through the use of an intuitive six-digit coding system and cloud-based portal—UniqID asset tracker makes it easy to label, track and replace hose assemblies.

uniqID

To get started, contact UniqID@Danfoss.com
or visit Danfoss.com/UniqID



### Label

**Drive aftermarket sales**
Via the UniqID code or label branding

**Grow your business**
Offer services to set yourself apart from the competition

**Prevent attrition**
Provide shared asset management information with key accounts

### Track

**Eliminate paper**
With a web-based platform

**Proactive inspection and replacement**
Cyclical approach to maintenance, increasing sales potential

**Improve decision making**
With product lifecycle analysis tools

**Manage safety certificatio**
With electronic attachment features

### Replace

**Increase uptime**
With proactive maintenance capabilities

**Reduce downtime**
Order replacements without ever bringing in a hose assembly

**Reduce fines**
By having critical documentation easy to find electronically

### Assemble

**Save time**
UniqID's bill of material feature takes the guesswork out of hose replacement

**Reduce errors**
Labels provide critical data at-a-glance

**Increase efficiency**
Leverage shared attachments; no time wasted searching paper trails



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# Our laylines provide **vital hose data** instantly.

## *Danfoss MatchMate® fitting system:

Match fittings to hose with ease.

### Braided hose:

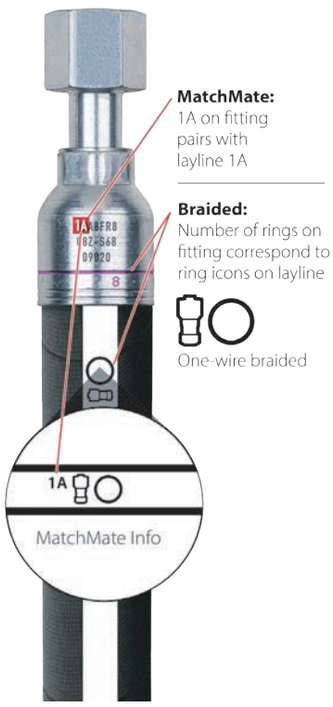
Fitting Part Number:

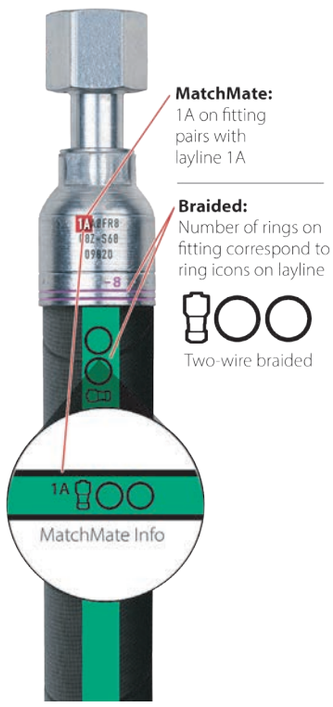
**1A** on the layline should pair with a **1A** on the fitting part number.

One or two-wire braid:

One **O** on the layline will match with one ring on fitting designating **one-wire braided hose.**

Double **OO** on the layline will match with two rings on fitting designating **two-wire braided hose.**



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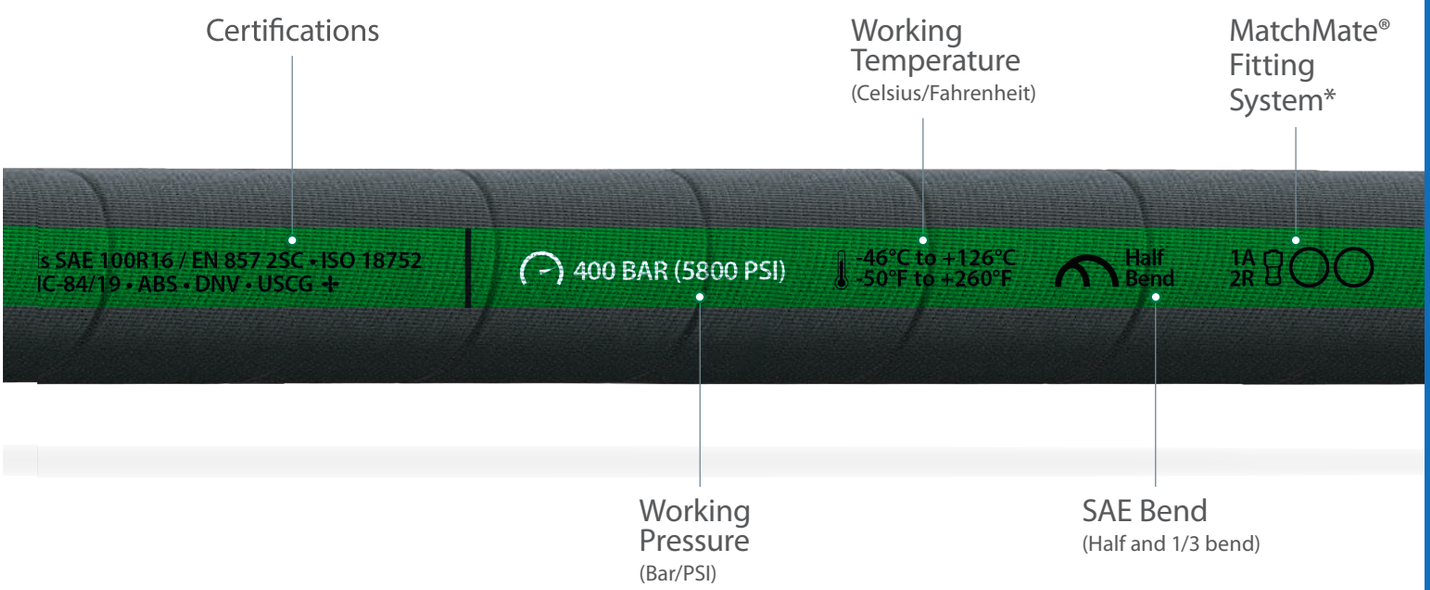



## Spiral hose:

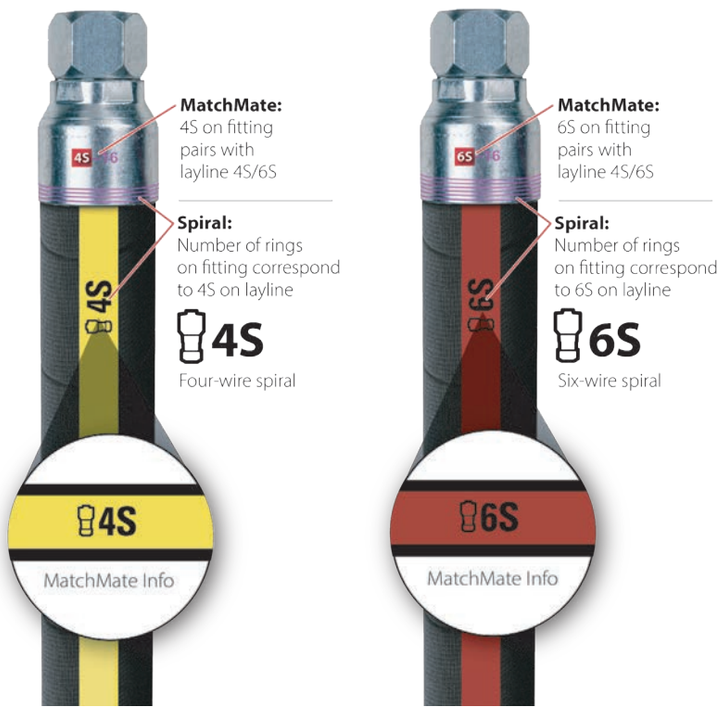
### Fitting Part Number:

A **4S** or **6S** on the layline should pair with a **4S** or **6S** on the fitting part number.

### Four or six-wire spiral

A **4S** on layline should pair with **four rings on fitting** designating **four-wire spiral hose.**

A **6S** on layline will match with **six rings on fitting** designating **six-wire spiral hose.**



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| **EC215 Standard** Braided Hose | | **1/4" to 1"** | **EN853 Type 2SC Exceeds SAE 100R16 ISO1436-1, Type 2SC** | **B3** |
| **GH781 Premium Braided Hose** MatchMate Global Green layline | | **1/4" to 2"** | **EN857 Type 2SC Exceeds SAE 100R16 ISO11237, Type 2SC 1/2 SAE Bend Radius** | **B4** |
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| **FC250H AQP** Hose | | **3/16" to 7/8"** | **DNV-GL / ABS / USCG** | **B38** |

Aeroquip

## Premium core hose
## GH681

Premium

# GH681

Core premium
one wire braided hose

**Meets or exceeds:**
SAE 100R17 performance | EN 857 Type 1SC performance | ISO 1436 1SN | ISO 18752

**Typical application:**

Petroleum and fire-resistant hydraulic fluids, fuel and lubricating oils, gasoline, water and other industrial fluids

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| ABS \| DNV \| USCG | | |
| **Hose construction:** | **Inner Tube:** Nitrile | **Reinforcement:** One wire braid | **Cover:** Dura-Tuff premium abrasion |
| **Operating temperature:** | -46°C to +126°C (-50°F to +260°F) | | |
| **Qualified fittings:** | 1A Series \| 1R Series (-4, -6, -8, -12, -16) | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **GH681-3** | 4,8 | 0.19 | 10,9 | 0.42 | 250,0 | 3,650 | 1000 | 14,500 | 45,0 | 1.77 | 0,16 | 0.11 |
| **GH681-4** | 6,4 | 0.25 | 12,9 | 0.51 | 255,0 | 3,700 | 1020 | 14,800 | 50,0 | 1.97 | 0,21 | 0.14 |
| **GH681-5** | 7,9 | 0.31 | 14,0 | 0.55 | 225,0 | 3,250 | 900 | 13,000 | 55,0 | 2.17 | 0,22 | 0.15 |
| **GH681-6** | 9,5 | 0.38 | 16,3 | 0.64 | 235,0 | 3,400 | 940 | 13,600 | 63,0 | 2.48 | 0,31 | 0.21 |
| **GH681-8** | 12,7 | 0.50 | 19,9 | 0.78 | 221,0 | 3,200 | 883 | 12,800 | 90,0 | 3.54 | 0,43 | 0.29 |
| **GH681-10** | 15,9 | 0.63 | 22,3 | 0.88 | 140,0 | 2,025 | 559 | 8,100 | 100,0 | 3.94 | 0,44 | 0.29 |
| **GH681-12** | 19,0 | 0.75 | 26,0 | 1.02 | 138,0 | 2,000 | 552 | 8,000 | 120,0 | 4.72 | 0,56 | 0.37 |
| **GH681-16** | 25,4 | 1.00 | 34,0 | 1.34 | 103,0 | 1,500 | 414 | 6,000 | 150,0 | 5.91 | 0,84 | 0.56 |
| **GH681-20** | 31,8 | 1.25 | 41,5 | 1.63 | 69,0 | 1,000 | 276 | 4,000 | 210,0 | 8.27 | 1,01 | 0.68 |
| **GH681-24** | 38,1 | 1.50 | 47,9 | 1.89 | 52,0 | 750 | 207 | 3,000 | 250,0 | 9.84 | 1,23 | 0.83 |
| **GH681-32** | 50,8 | 2.00 | 64,0 | 2.52 | 41,0 | 600 | 166 | 2,400 | 315,0 | 12.4 | 2,01 | 1.32 |

**Core** | **Premium** | Standard | **Braided** | Spiral | High-Temp | Low-Temp | Abrasion | Suction



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High-Temp

# GH194

Core premium high-temp one wire braided hose

**Meets:** SAE 100R1 | EN 853 1SN

Aeroquip by Danfoss | GH194-6 | 9.5 mm (0.38 in) DN10 | AQP High Temp | Exceeds SAE 100R1 / EN 853 1SN MSHA IC-84/18 • ABS • DNV | 215 BAR (3125 PSI) | -40°C to +150°C -40°F to +302°F | 1A

**Typical application:**

Petroleum and fire-resistant hydraulic fluids, fuel and lubricating oils, gasoline, water and other industrial fluids

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| ABS \| DNV | | |
| **Hose construction:** | **Inner Tube:** AQP Elastomer | **Reinforcement:** One wire braid | **Cover:** Blue CPE |
| **Operating temperature:** | -40°C to +150°C (-40°F to +302°F) | | |
| **Qualified fittings:** | 1A Series | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **GH194-4** | 6,4 | 0.25 | 13,5 | 0.53 | 225 | 3,250 | 900 | 13,000 | 100,0 | 3.94 | 0,25 | 0.17 |
| **GH194-6** | 9,5 | 0.38 | 17,3 | 0.68 | 215 | 3,125 | 860 | 12,500 | 125,0 | 4.92 | 0,37 | 0.25 |
| **GH194-8** | 12,7 | 0.50 | 20,4 | 0.80 | 175 | 2,550 | 700 | 10,200 | 180,0 | 7.09 | 0,45 | 0.30 |
| **GH194-10** | 15,9 | 0.62 | 23,8 | 0.94 | 140 | 2,050 | 560 | 8,200 | 205,0 | 8.07 | 0,54 | 0.36 |
| **GH194-12** | 19,0 | 0.75 | 27,4 | 1.08 | 125 | 1,800 | 500 | 7,200 | 240,0 | 9.45 | 0,69 | 0.46 |
| **GH194-16** | 25,4 | 1.00 | 36,2 | 1.42 | 90 | 1,300 | 360 | 5,200 | 300,0 | 11.81 | 0,98 | 0.66 |
| **GH194-20** | 31,8 | 1.25 | 43,9 | 1.73 | 65 | 950 | 260 | 3,800 | 420,0 | 16.54 | 1,26 | 0.85 |
| **GH194-24** | 38,1 | 1.50 | 50,6 | 1.99 | 50 | 725 | 200 | 2,900 | 500,0 | 19.69 | 1,58 | 1.06 |
| **GH194-32** | 50,8 | 2.00 | 59,2 | 2.33 | 40 | 580 | 160 | 2,320 | 630,0 | 24.80 | 2,04 | 1.37 |

Aeroquip

## Standard core hose
## EC215

Standard

# EC215 | Winner two wire braid hose

**Meets:** EN 857 2SC | ISO 18752

**Winner** by Danfoss **EC215-06** | 9.5 mm (0.38 in) DN10 | EN 857 2SC • ISO 18752 MSHA IC-84/41 • DNV • USCG + | 345 BAR (5000 PSI) | -40°C to +100°C -40°F to +212°F | Half Bend | 1A • Z 2R • 2PC

**Typical application:**

Hydraulic system service with petroleum and water based fluids, for general industrial service.

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| DNV \| USCG | | |
| **Hose construction:** | **Inner Tube:** Nitrile | **Reinforcement:** Two wire braid | **Cover:** Nitrile |
| **Operating temperature:** | -40°C to +100°C (-40°F to +212°F) | | |
| **Qualified fittings/socket:** | Fittings: 1A Series \| 2-piece Winner \| 2R Field attachable<br>Socket: 03310 (pg 173) | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **EC215-04** | 6.4 | 0.25 | 13.5 | 0.53 | 400 | 5,800 | 1,600 | 23,200 | 50 | 1.97 | 0.28 | 0.19 |
| **EC215-06** | 9.5 | 0.38 | 17.5 | 0.69 | 345 | 5,000 | 1,380 | 20,000 | 65 | 2.56 | 0.41 | 0.28 |
| **EC215-08** | 12.7 | 0.50 | 20.8 | 0.82 | 275 | 4,000 | 1,100 | 16,000 | 90 | 3.54 | 0.57 | 0.38 |
| **EC215-10** | 15.9 | 0.62 | 24.0 | 0.94 | 250 | 3,650 | 1,000 | 14,600 | 100 | 3.94 | 0.68 | 0.46 |
| **EC215-12** | 19.0 | 0.75 | 27.9 | 1.10 | 215 | 3,125 | 860 | 12,500 | 120 | 4.72 | 0.81 | 0.54 |
| **EC215-16** | 25.4 | 1.00 | 35.7 | 1.41 | 165 | 2,400 | 660 | 9,600 | 160 | 6.30 | 1.17 | 0.79 |
| **EC215-20** | 31.8 | 1.25 | 43.9 | 1.73 | 125 | 1,800 | 500 | 7,200 | 250 | 9.84 | 1.56 | 1.05 |
| **EC215-24** | 38.1 | 1.50 | 51.0 | 2.01 | 100 | 1,450 | 400 | 5,800 | 300 | 11.81 | 1.81 | 1.22 |
| **EC215-32** | 50.8 | 2.00 | 63.4 | 2.50 | 90 | 1,300 | 380 | 5,500 | 400 | 15.75 | 2.36 | 1.59 |



**Core** | Premium | **Standard** | **Braided** | Spiral | High-Temp | Low-Temp | Abrasion | Suction

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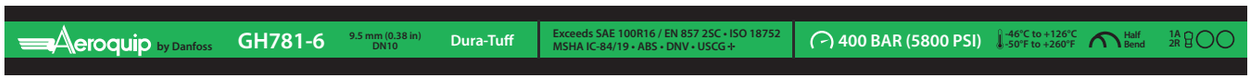
Premium

# GH781 | Core premium two wire braided hose

**Meets or exceeds:** SAE 100R16 | EN 857 2SC | ISO 18752




**Typical application:**

Hydraulic systems service with petroleum and water based fluids, for general use.

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| ABS \| DNV \| USCG | | |
| **Hose construction:** | **Inner Tube:** Nitrile | **Reinforcement:** Two wire braid | **Cover:** Dura-Tuff premium abrasion |
| **Operating temperature:** | -46°C to +126°C (-50°F to +260°F) | | |
| **Qualified fittings:** | 1A Series \| 2R Series | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **GH781-4** | 6,4 | 0.25 | 13,9 | 0.55 | 448 | 6,500 | 1792 | 26,000 | 50,0 | 1.96 | 0,33 | 0.22 |
| **GH781-6** | 9,5 | 0.38 | 17,4 | 0.69 | 400 | 5,800 | 1600 | 23,200 | 65,0 | 2.55 | 0,43 | 0.29 |
| **GH781-8** | 12,7 | 0.50 | 20,9 | 0.82 | 345 | 5,000 | 1240 | 20,000 | 90,0 | 3.54 | 0,58 | 0.39 |
| **GH781-10** | 15,9 | 0.62 | 24,0 | 0.94 | 276 | 4,000 | 1104 | 16,000 | 100,0 | 3.94 | 0,65 | 0.44 |
| **GH781-12** | 19,0 | 0.75 | 27,9 | 1.10 | 241 | 3,500 | 964 | 14000, | 120,0 | 4.72 | 0,79 | 0.53 |
| **GH781-16** | 25,4 | 1.00 | 35,9 | 1.41 | 207 | 3,000 | 828 | 12,000 | 150,0 | 5.90 | 1,07 | 0.72 |
| **GH781-20** | 31,8 | 1.25 | 43,4 | 1.71 | 172 | 2,500 | 688 | 10,000 | 210,0 | 8.26 | 1,62 | 1.09 |
| **GH781-24** | 38,1 | 1.50 | 51,5 | 2.03 | 138 | 2,000 | 552 | 8,000 | 250,0 | 9.84 | 2,08 | 1.40 |
| **GH781-32** | 50,8 | 2.00 | 63,9 | 2.52 | 110 | 1,600 | 440 | 6,400 | 315,0 | 12.40 | 2,83 | 1.90 |

Aeroquip

**Premium core hose**
**EC881**

Premium

# EC881

Core premium Dynamax ultra-performance two wire braided hose

**Exceeds:** SAE 100R16 | SAE 100R19 | EN 857 2SC | ISO 18752

**Typical application:**

Hydraulic systems with petroleum and water-based fluids, for general industrial service.

This Dynamax ultra-performance hose with the Danfoss Dura-Pulse inner tube combines the lightweight flexibility of a two-wire braided hose with the pressure and performance of spiral 100R12 hoses (-16 and smaller).

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| ABS \| DNV | | |
| **Hose construction:** | **Inner Tube:** Dura-Pulse patented tube | **Reinforcement:** Two wire braid | **Cover:** Dura-Tuff premium abrasion |
| **Operating temperature:** | -46°C to +126°C (-50°F to +260°F)<br>-46º C to +70º C (-50 to +158º F) for water based hyd. fluids<br>0º C to +70º C (+32ºF to 158º F) for water | | |
| **Qualified fittings:** | 1A Series | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **EC881-4** | 6.4 | 0.25 | 13.6 | 0.54 | 450 | 6,525 | 1800 | 26,100 | 33 | 1.30 | 0.32 | 0.22 |
| **EC881-6** | 9.5 | 0.38 | 17.3 | 0.68 | 400 | 5,800 | 1600 | 23,200 | 42 | 1.65 | 0.42 | 0.28 |
| **EC881-8** | 12.7 | 0.50 | 20.9 | 0.82 | 360 | 5,220 | 1440 | 20,880 | 60 | 2.36 | 0.58 | 0.39 |
| **EC881-10** | 15.9 | 0.62 | 24.0 | 0.94 | 350 | 5,075 | 1400 | 20,300 | 68 | 2.68 | 0.75 | 0.50 |
| **EC881-12** | 19.0 | 0.75 | 27.9 | 1.10 | 330 | 4,785 | 1320 | 19,140 | 80 | 3.15 | 1.03 | 0.69 |
| **EC881-16** | 25.4 | 1.00 | 34.6 | 1.36 | 280 | 4,060 | 1120 | 16,240 | 150 | 5.91 | 1.47 | 0.99 |
| **EC881-20** | 31.8 | 1.25 | 43.4 | 1.71 | 172 | 2,500 | 688 | 9,980 | 210 | 8.27 | 1.75 | 1.18 |
| **EC881-24** | 38.1 | 1.50 | 51.8 | 2.04 | 138 | 2,000 | 552 | 8,000 | 250 | 9.84 | 1.91 | 1.28 |



**Core** | **Premium** | Standard | **Braided** | Spiral | High-Temp | Low-Temp | Abrasion | Suction

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Ultra-Abrasion

# FC735

Core premium Bruiser ultra-abrasion two wire braided hose

**Exceeds:** SAE 100R16 | EN 857 2SC | ISO 18752

Aeroquip by Danfoss | FC735-06 | 9.5 mm (0.38 in) DN10 | Bruiser | Exceeds SAE 100R16 / EN 857 2SC ISO 18752 • MSHA IC-84/71 • ABS • DNV | 400 BAR (5800 PSI) | -40°C to +126°C -40°F to +260°F | Half Bend | 1A

**Typical application:**

Hydraulic systems service with petroleum and water based fluids, for general use.

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| ABS \| DNV | | |
| **Hose construction:** | **Inner Tube:** Nitrile | **Reinforcement:** Two wire braid | **Cover:** Bruiser ultra-abrasion |
| **Operating temperature:** | -40°C to +126°C (-40°F to +260°F) | | |
| **Qualified fittings:** | 1A Series | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **FC735-04** | 6,4 | 0.25 | 14,1 | 0.55 | 448 | 6,500 | 1792 | 26,025 | 50 | 1.97 | 0,31 | 0.21 |
| **FC735-06** | 9,5 | 0.38 | 17,4 | 0.69 | 400 | 5,800 | 1600 | 23,200 | 65 | 2.56 | 0,42 | 0.28 |
| **FC735-08** | 12,7 | 0.50 | 20,8 | 0.82 | 345 | 5,000 | 1380 | 20,000 | 90 | 3.54 | 0,49 | 0.33 |
| **FC735-10** | 15,9 | 0.62 | 24,9 | 0.98 | 276 | 4,000 | 1104 | 16,060 | 100 | 3.94 | 0,71 | 0.48 |
| **FC735-12** | 19,0 | 0.75 | 28,4 | 1.12 | 241 | 3,500 | 964 | 13,960 | 120 | 4.72 | 0,83 | 0.56 |
| **FC735-16** | 25,4 | 1.00 | 35,7 | 1.41 | 207 | 3,000 | 828 | 12,000 | 150 | 5.91 | 1,19 | 0.80 |
| **FC735-20** | 31,8 | 1.25 | 43,3 | 1.70 | 172 | 2,500 | 688 | 9,965 | 210 | 8.27 | 1,52 | 1.02 |

**Core** | **Premium** | Standard | **Braided** | Spiral | High-Temp | Low-Temp | **Abrasion** | Suction



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Aeroquip

## Premium core hose
## GH195

High-Temp

# GH195

Core premium AQP high-temp two wire braided hose

**Meets:** SAE 100R2 | EN 853 2SN | ISO 1436 2SN

Aeroquip by Danfoss | GH195-6 | 9.5 mm (0.38 in) DN10 | AQP High Temp | SAE 100R2 / EN 853 2SN • ISO 1436-1 2SN MSHA IC-84/18 • ABS • DNV • USCG | 345 BAR (5000 PSI) | -40°C to +150°C -40°F to +302°F | 1A

**Typical application:**

Petroleum and fire resistant hydraulic fluids, fuel, and lubricating systems

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| ABS \| DNV \| USCG | | |
| **Hose construction:** | **Inner Tube:** CPE | **Reinforcement:** Two wire braid | **Cover:** CPE |
| **Operating temperature:** | -40°C to +150°C (-40°F to +302 °F) | | |
| **Qualified fittings:** | 1A Series | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **GH195-4** | 6,4 | 0.25 | 15,1 | 0.59 | 400,0 | 5,800 | 1600,0 | 23,200 | 102,0 | 4.02 | 0,40 | 0.27 |
| **GH195-6** | 9.5 | 0.38 | 19,2 | 0.75 | 345,0 | 5,000 | 1380,0 | 20,000 | 127,0 | 5.00 | 0,58 | 0.39 |
| **GH195-8** | 12,7 | 0.50 | 22,1 | 0.87 | 293,0 | 4,250 | 1172,0 | 17,000 | 178,0 | 7.01 | 0,68 | 0.46 |
| **GH195-10** | 15.9 | 0.62 | 25,5 | 1.00 | 250,0 | 3,650 | 1000,0 | 14,600 | 203,0 | 7.99 | 0,80 | 0.54 |
| **GH195-12** | 19,0 | 0.75 | 29,5 | 1.16 | 215,0 | 3,125 | 860,0 | 12,500 | 241,0 | 9.49 | 1,00 | 0.67 |
| **GH195-16** | 25,4 | 1.00 | 37,8 | 1.49 | 175,0 | 2,550 | 700,0 | 10,200 | 305,0 | 12.01 | 1,44 | 0.97 |
| **GH195-20** | 31,8 | 1.25 | 48,5 | 1.91 | 155,0 | 2,250 | 620,0 | 9,000 | 419,0 | 16.50 | 2,38 | 1.60 |
| **GH195-24** | 38,1 | 1.50 | 55,1 | 2.17 | 125,0 | 1,800 | 500,0 | 7,250 | 508,0 | 20.00 | 2,59 | 1.74 |
| **GH195-32** | 50,8 | 2.00 | 67,8 | 2.67 | 105,0 | 1,525 | 420,0 | 6,100 | 635,0 | 25.00 | 3,38 | 2.27 |

**Core** | **Premium** | Standard | **Braided** | Spiral | **High-Temp** | Low-Temp | Abrasion | Suction



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Ultra-Abrasion

# FC736

Core premium Bruiser ultra-abrasion four wire spiral hose

**Exceeds:** SAE 100R12 | EN 856 R12 | ISO 18752

Aeroquip by Danfoss | FC736-06 | 9.5 mm (0.38 in) DN10 | Bruiser | Exceeds SAE 100R12 / EN 856 R12 ISO 18752 • MSHA IC-84/71 • DNV | 380 BAR (5500 PSI) | -40°C to +121°C -40°F to +250°F | 4S

**Typical application:**

High abrasion industrial and hydraulic system applications with petroleum and water-based fluids

Recommended for critical applications in construction, forestry, and other off-highway vehicles

Bruiser ultra-abrasion outer cover offers unmatched abrasion, chemical and environmental protection

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| DNV | | |
| **Hose construction:** | **Inner Tube:** Nitrile | **Reinforcement:** Four wire spiral | **Cover:** Bruiser ultra-abrasion |
| **Operating temperature:** | -40ºC to +121°C (-40°F to +250°F) | | |
| **Qualified fittings:** | 4S Series | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **FC 736-06** | 9,5 | 0.38 | 20,2 | 0.80 | 380 | 5,500 | 1520 | 22,000 | 125 | 4.92 | 0,71 | 0.48 |
| **FC736-08** | 12,7 | 0.50 | 23,6 | 0.93 | 345 | 5,000 | 1380 | 20,000 | 180 | 7.09 | 0,83 | 0.56 |
| **FC736-10** | 15,9 | 0.62 | 27,4 | 1.08 | 345 | 5,000 | 1380 | 20,000 | 200 | 7.87 | 0,98 | 0.66 |
| **FC736-12** | 19,0 | 0.75 | 30,7 | 1.21 | 280 | 4,050 | 1120 | 16,200 | 240 | 9.45 | 1,32 | 0.89 |
| **FC736-16** | 25,4 | 1.00 | 37,9 | 1.49 | 280 | 4,050 | 1120 | 16,200 | 300 | 11.81 | 1,75 | 1.18 |
| **FC736-20** | 31,8 | 1.25 | 46,6 | 1.83 | 210 | 3,050 | 840 | 12,200 | 420 | 16.54 | 2,36 | 1.59 |
| **FC736-24** | 38,1 | 1.50 | 53,9 | 2.12 | 175 | 2,550 | 700 | 10,200 | 500 | 19.68 | 3,00 | 2.01 |
| **FC736-32** | 50,8 | 2.00 | 66,8 | 2.63 | 175 | 2,550 | 700 | 10,200 | 640 | 25.2 | 4,37 | 2.94 |

Aeroquip

## Premium core hose
## GH493

Premium

# GH493

Core premium
four wire spiral hose

**Exceeds:** SAE 100R12 | EN 856 R12

Aeroquip by Danfoss | GH493-6 | 9.5 mm (0.38 in) DN10 | Dura-Tuff | Exceeds SAE 100R12 / EN 856 R12 MSHA IC-84/19 • ABS • DNV • USCG + | 448 BAR (6500 PSI) | -40°C to +126°C -40°F to +260°F | Half Bend | 4S

**Typical application:**

For very high pressure hydraulic lines subjected to pressure surges and flexing Typical applications include construction, mining, farming and high performance industrial equipmen

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| ABS \| DNV \| USCG | | |
| **Hose construction:** | **Inner Tube:** Nitrile | **Reinforcement:** Four wire spiral | **Cover:** Dura-Tuff premium abrasion |
| **Operating temperature:** | -40°C to +126°C (-40°F to +260°F) | | |
| **Qualified fittings:** | 4S Series | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **GH493-6** | 9,5 | 0.38 | 20,2 | 0.80 | 448,0 | 6,500 | 1792,0 | 26,000 | 62,5 | 2.46 | 0,71 | 0.47 |
| **GH493-8** | 12,7 | 0.50 | 23,6 | 0.93 | 415,0 | 6,000 | 1660,0 | 24,000 | 90,0 | 3.54 | 0,88 | 0.59 |
| **GH493-10** | 15,9 | 0.62 | 27,4 | 1.08 | 415,0 | 6,000 | 1660,0 | 24,000 | 100,0 | 3.94 | 1,04 | 0.70 |
| **GH493-12** | 19,0 | 0.75 | 30,7 | 1.21 | 380,0 | 5,500 | 1520,0 | 22,000 | 120,0 | 4.72 | 1,34 | 0.90 |
| **GH493-16** | 25,4 | 1.00 | 37,9 | 1.49 | 350,0 | 5,100 | 1400,0 | 20,400 | 150,0 | 5.91 | 1,79 | 1.20 |
| **GH493-20** | 31,8 | 1.25 | 46,6 | 1.83 | 310,0 | 4,500 | 1240,0 | 18,000 | 210,0 | 8.27 | 2,23 | 1.50 |
| **GH493-24** | 38,1 | 1.50 | 53,9 | 2.12 | 275,0 | 4,000 | 1100,0 | 16,000 | 250,0 | 9.84 | 3,03 | 2.03 |
| **GH493-32** | 50,8 | 2.00 | 66,8 | 2.63 | 275,0 | 4,000 | 1100,0 | 16,000 | 320,0 | 12.60 | 4,38 | 2.94 |



**Core** | **Premium** | Standard | Braided | **Spiral** | High-Temp | Low-Temp | Abrasion | Suction

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# EC910

Premium SafeShield Waterblast four wire spiral hose

**Meets:** ISO 7751 | EN 1829-2 (impulse)

Aeroquip by Danfoss | EC910-08 | 12.7 mm (0.50 in) DN12 | Dura-Tuff | ISO 7751 / EN 1829-2 IMPULSE MSHA IC-84/43 | 1100 BAR (16000 PSI) | -40°C to +93°C -40°F to +200°F | 1W

Typical application:

Waterblast service with water, water-soap, emulsion

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA | | |
| **Hose construction:** | **Inner Tube:** Nitrile | **Reinforcement:** Four wire spiral | **Cover:** Dura-Tuff premium abrasion with WJTA* color-coded laylines |
| **Operating temperature:** | -40°C to +93°C (-40°F to +200°F) Continuous service temperature range -10°C to +80°C (-14°F to +176°F) | | |
| **Qualified fittings:** | 1W Series | | |

*Water Jetting Technology Association

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **EC910-08C50** | 12,7 | 0.50 | 24,6 | 0.97 | 1100,0 | 16,000 | 2750,0 | 40,000 | 228,6 | 9.00 | 1,12 | 0.75 |
| **EC910-12C50** | 19,0 | 0.75 | 32,8 | 1.29 | 1000,0 | 14,500 | 2500,0 | 36,250 | 279,4 | 11.00 | 1,74 | 1.17 |
| **EC910-16C50** | 25,4 | 1.00 | 39,9 | 1.57 | 700,0 | 10,200 | 1750,0 | 25,500 | 304,8 | 12.00 | 2,23 | 1.50 |

* 50 foot cut lengths (orders must be placed in 50 foot increments)



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Premium hose
GH506

# GH506

Premium
four wire spiral hose

**Meets:** EN 856 4SH | ISO 3862 4SH | ISO 18752

**Typical application:**

High pressure hydraulic systems with petroleum and water-based fluids

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| ABS \| DNV | | |
| **Hose construction:** | **Inner Tube:** Nitrile | **Reinforcement:** Four wire spiral | **Cover:** Dura-Tuff premium abrasion |
| **Operating temperature:** | -40°C to +100°C (-40°F to +212°F) | | |
| **Qualified fittings:** | 1W Series \| 4S Series | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **GH506-12** | 19,0 | 0.75 | 32,2 | 1.27 | 420,0 | 61,00 | 1680,0 | 24,400 | 280,0 | 11.02 | 1,49 | 1.00 |
| **GH506-16** | 25,4 | 1.00 | 38,3 | 1.51 | 420,0 | 6,100 | 1680,0 | 24,400 | 340,0 | 13.39 | 2,05 | 1.38 |
| **GH506-20** | 31,8 | 1.25 | 45,5 | 1.79 | 350,0 | 5,100 | 1400,0 | 20,400 | 460,0 | 18.11 | 2,54 | 1.71 |
| **GH506-24** | 38,1 | 1.50 | 535 | 2.11 | 300,0 | 4,350 | 1200,0 | 17,400 | 560,0 | 22.05 | 3,27 | 2.20 |
| **GH506-32** | 50,8 | 2.00 | 68,1 | 2.68 | 250,0 | 3,650 | 1000,0 | 14,500 | 700,0 | 27.56 | 4,58 | 3.08 |





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High-Temp

# EC525

Core premium AQP™ high-temp four & six wire spiral hose

**Exceeds:** SAE 100R12 | EN 856

Aeroquip by Danfoss | EC525-12 | 19 mm (0.75 in) DN19 | AQP High Temp | MSHA IC-84/18 | 345 BAR (5000 PSI) | -40°C to +149°C -40°F to +300°F | 4S

**Typical application:**

Hydraulic system service with petroleum, fire-resistant, and water-based fluids, fuel, and lubricating systems

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA | | |
| **Hose construction:** | **Inner Tube:** AQP Elastomer | **Reinforcement:** Four wire spiral (-12 to -24) Six wire spiral (-32)` | **Cover:** CPE high-temp |
| **Operating Temperature:** | Typical fluids: -40°C To +149°C (-40°F To +300°F) Phosphate-ester base fluids: -40°C To +82°C (-40°F To +180°F) | | |
| **Qualified fittings:** | 4S Series | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **EC525-12** | 19,0 | 0.75 | 30,7 | 1.21 | 345,0 | 5,000 | 1380,0 | 20,000 | 241,3 | 9.50 | 1,28 | 0.86 |
| **EC525-16** | 25,4 | 1.00 | 37,9 | 1.49 | 345,0 | 5,000 | 1380,0 | 20,000 | 304,8 | 12.00 | 1,73 | 1.16 |
| **EC525-20** | 31,8 | 1.25 | 46,6 | 1.84 | 240,0 | 3,500 | 960,0 | 14,000 | 419,1 | 16.50 | 2,31 | 1.55 |
| **EC525-24** | 38,1 | 1.50 | 53,9 | 2.12 | 240,0 | 3,500 | 960,0 | 14,000 | 508,0 | 20.00 | 2,96 | 1.99 |
| **EC525-32** | 50,8 | 2.00 | 67,3 | 2.65 | 225,0 | 3,250 | 900,0 | 13,000 | 635,0 | 25.00 | 4,42 | 2.97 |

Aeroquip

## Premium core hose
## FC500

Premium

# FC500

Core premium X-Flex four & six wire spiral hose

**Exceeds:** SAE 100R13 | EN 856 | ISO 3862

**Typical application:**

Ultra high pressure applications compatible with petroleum and water-based fluids

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| DNV \| USCG | | |
| **Hose construction:** | **Inner Tube:** Nitrile | **Reinforcement:** Four wire spiral (-12 to -24) Six wire spiral (-32) | **Cover:** Dura-Tuff premium abrasion |
| **Operating temperature:** | -40°C to +127°C (-40°F to +260°F) | | |
| **Qualified fittings:** | 4S Series (-12 to -24) \| 6S Series (-32) | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **FC500-12** | 19,0 | 0.75 | 31,0 | 1.22 | 350,0 | 5,100 | 1400,0 | 20,400 | 121,0 | 4.75 | 1,28 | 0.86 |
| **FC500-16** | 25,4 | 1.00 | 38,4 | 1.51 | 350,0 | 5,100 | 1400,0 | 20,400 | 152,0 | 6.00 | 1,85 | 1.24 |
| **FC500-20** | 31,8 | 1.25 | 45,5 | 1.79 | 350,0 | 5,100 | 1400,0 | 20,400 | 210,0 | 8.25 | 2,50 | 1.68 |
| **FC500-24** | 38,1 | 1.50 | 53,5 | 2.11 | 350,0 | 5,100 | 1400,0 | 20,400 | 254,0 | 10.00 | 3,38 | 2.27 |
| **FC500-32**** | 50,8 | 2.00 | 71,8 | 2.83 | 350,0 | 5,100 | 1400,0 | 20,400 | 476,0 | 18.75 | 6,07 | 4.08 |

** Six wire spiral





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Premium

# EC600

Core premium X-Flex four & six wire spiral hose

**Meets or exceeds:** SAE 100R15 | ISO 18752

Aeroquip by Danfoss **EC600-12** | 19.0 MM (0.75 IN) DN19 | Dura-Tuff X-Flex | Exceeds SAE 100R15 • ISO 18752 MSHA IC-84/19 • ABS • DNV • USCG + | 420 BAR (6100 PSI) | -40°C to +127°C -40°F to +260°F | Half Bend | 1W 4S

**Typical application:**

High pressure hydraulic circuits on mobile construction equipment, mining equipment, and industrial applications for pressures up to 420 bar.

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| ABS \| DNV \| USCG | | |
| **Hose construction:** | **Inner Tube:** Dura-Pulse patented inner tube | **Reinforcement:** Four wire spiral (-12 to -16) Six wire spiral (-20 to -32) | **Cover:** Dura-Tuff premium abrasion |
| **Operating Temperature:** | -40°C to +127°C (-40°F to +260°F) | | |
| **Qualified fittings:** | 4S Series (-12 to -16) \| 6S Series (-20 to -32) \| 1W Series | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **EC600-12** | 19.0 | 0.75 | 32.2 | 1.27 | 420 | 6,100 | 1,680 | 24,400 | 135 | 5.31 | 1.52 | 1.01 |
| **EC600-16** | 25.4 | 1.00 | 38.6 | 1.52 | 420 | 6,100 | 1,680 | 24,400 | 165 | 6.5 | 2.04 | 1.36 |
| **EC600-20**** | 31.8 | 1.25 | 49.7 | 1.96 | 420 | 6,100 | 1,680 | 24,400 | 225 | 8.86 | 3.89 | 2.61 |
| **EC600-24**** | 38.1 | 1.50 | 57.5 | 2.26 | 420 | 6,100 | 1,680 | 24,400 | 265 | 10.43 | 4.83 | 3.24 |
| **EC600-32**** | 50.8 | 2.00 | 71.0 | 2.79 | 420 | 6,100 | 1,680 | 24,400 | 375 | 14.76 | 7.1 | 4.77 |

**Six wire spiral

Aeroquip

## Premium hose
## GH466

# GH466 | Premium six wire spiral hose

**Exceeds:** SAE 100R15 | EN 856 R13

**Typical application:**

High pressure hydraulic systems with extreme pressure peaks. For use with petroleum and water-based fluids

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| ABS \| DNV | | |
| **Hose construction:** | **Inner Tube:** Nitrile | **Reinforcement:** Six wire spiral | **Cover:** Dura-Tuff premium abrasion |
| **Operating temperature:** | -40°C to +121°C (-40°F to +250°F) | | |
| **Qualified fittings:** | 6S Series (-20, -24)<br>1W Series (ALL) | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **GH466-20** | 31,8 | 1.25 | 49,4 | 1.94 | 420,0 | 6,100 | 1680,0 | 24,400 | 420,0 | 16.53 | 3,48 | 2.34 |
| **GH466-24** | 38,1 | 1.50 | 57,3 | 2.26 | 420,0 | 6,100 | 1680,0 | 24,400 | 500,0 | 19.69 | 4,63 | 3.11 |
| **GH466-32*** | 50,8 | 2.00 | 71,7 | 2.82 | 420,0 | 6,100 | 1680,0 | 24,400 | 630,0 | 24.80 | 6,70 | 4.50 |

*only qualified with 1W fittings





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## FC350 | One Wire / Polester braid

**Typical Application**

Hydraulics, fuel and lubricating oils, air and water

| | |
|---|---|
| **Agency Specifcation:** | FMVSS106 / DNV / ABS / J1402 |
| **Hose Construction:** | Inner Tube Reinforcement Cover<br>AQP One wire Polyester Braid |
| **Operating Temperature:** | -49°C to +150°C<br>Except air +121°C |
| **Qualified Fittings:** | R5 Reusables<br>Crimp |

| Part Number | FC350 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) |
| 4 | 0.19 | 0.52 | 140,0 | 2000 | 560,0 | 8000 | 19,1 | 0.75 | 28 |
| 5 | 0.25 | 0.58 | 105,0 | 1500 | 420,0 | 6000 | 25,4 | 1.00 | 28 |
| 6 | 0.31 | 0.68 | 105,0 | 1500 | 420,0 | 6000 | 31,8 | 1.25 | 28 |
| 8 | 0.41 | 0.77 | 87,0 | 1250 | 350,0 | 5000 | 44,5 | 1.75 | 28 |
| 10 | 0.50 | 0.94 | 87,0 | 1250 | 350,0 | 5000 | 57,2 | 2.25 | 28 |
| 12 | 0.63 | 1.08 | 52,0 | 750 | 210,0 | 3000 | 69,9 | 2.75 | 20 |
| 16 | 0.88 | 1.23 | 28,0 | 400 | 112,0 | 1600 | 88,9 | 3.50 | 15 |
| 20 | 1.12 | 1.50 | 21,0 | 300 | 84,0 | 1200 | 114,3 | 4.50 | 15 |
| 24 | 1.38 | 1.75 | 17,0 | 250 | 70,0 | 1000 | 139,7 | 5.50 | 11 |



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## FC300 | One Wire / Polester braid

**Typical Application**

Hydraulics, fuel and lubricating oils, air and water

| | |
|---|---|
| **Agency Specifcation:** | FMVSS106 / DNV / ABS / J1402 / J1019 |
| **Hose Construction:** | Inner Tube: AQP; Reinforcement: One wire; Cover: Polyester Braid |
| **Operating Temperature:** | -49°C to +150°C Except air +121°C |
| **Qualified Fittings:** | R5 Reusables; Crimp |

| Part Number | | | FC300 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 4 | 0.19 | 0.52 | 210,0 | 3000 | 840,0 | 12000 | 76,2 | 3.00 | 28 | 0.19 |
| 5 | 0.25 | 0.58 | 210,0 | 3000 | 840,0 | 12000 | 85,9 | 3.38 | 28 | 0.24 |
| 6 | 0.31 | 0.67 | 157,0 | 2250 | 630,0 | 9000 | 101,6 | 4.00 | 28 | 0.34 |
| 8 | 0.41 | 0.76 | 140,0 | 2000 | 560,0 | 8000 | 117,3 | 4.62 | 28 | 0.39 |
| 10 | 0.50 | 0.93 | 122,0 | 1750 | 490,0 | 7000 | 139,7 | 5.50 | 28 | 0.55 |
| 12 | 0.63 | 1.08 | 105,0 | 1500 | 420,0 | 6000 | 165,1 | 6.50 | 28 | 0.69 |
| 16 | 0.88 | 1.27 | 56,0 | 800 | 224,0 | 3200 | 187,5 | 7.38 | 20† | 0.66 |
| 20 | 1.12 | 1.50 | 43,0 | 625 | 175,0 | 2500 | 228,6 | 9.00 | 20† | 0.78 |
| 24 | 1.38 | 1.75 | 35,0 | 500 | 140,0 | 2000 | 266,7 | 10.50 | 15† | 1.00 |
| 32 | 1.81 | 2.22 | 21,0 | 300 | 84,0 | 1200 | 336,6 | 13.25 | 11† | 1.40 |
| 40 | 2.38 | 2.88 | 21,0 | 300 | 84,0 | 1200 | 609,6 | 24.00 | 8† | 2.24 |

†Maximum negative pressure shown for -16 and larger are suitable for those which has suffered no external damage or kinking. If greater negative pressures are required for -16 and larger hoses, the use of an internal support coil is recommended.



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## 2807 | One Wire / Stainless braid

**Typical Application**

Hot air, compressor discharge and most chemical applications.

**Agency Specifcation:** DNV / USCG / 100R14A

| **Hose Construction:** | Inner Tube | Reinforcement / Cover |
|---|---|---|
| | Teflon | Stainless Steel |

**Operating Temperature:** -73°C to +260°C

**Qualified Fittings:** Super Gem Reusables
Crimp

| Part Number | 2807 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 4 | 0.14 | 0.25 | 210,0 | 3000 | 840,0 | 12000 | 38,1 | 1.50 | 28 | 0.06 |
| 5 | 0.19 | 0.30 | 210,0 | 3000 | 840,0 | 12000 | 50,8 | 2.00 | 28 | 0.09 |
| 6 | 0.26 | 0.37 | 210,0 | 3000 | 840,0 | 12000 | 76,2 | 3.00 | 28 | 0.12 |
| 8 | 0.32 | 0.43 | 175,0 | 2500 | 700,0 | 10000 | 101,6 | 4.00 | 28† | 0.15 |
| 10 | 0.42 | 0.54 | 140,0 | 2000 | 560,0 | 8000 | 133,4 | 5.25 | 28† | 0.18 |
| 12 | 0.51 | 0.63 | 105,0 | 1500 | 420,0 | 6000 | 165,1 | 6.50 | 28† | 0.24 |
| 16 | 0.64 | 0.76 | 84,0 | 1200 | 335,0 | 4800 | 196,9 | 7.75 | 28† | 0.27 |
| 20 | 0.88 | 1.03 | 70,0 | 1000 | 280,0 | 4000 | 228,6 | 9.00 | 12† | 0.39 |
| 24 | 1.12 | 1.29 | 43,0 | 625 | 175,0 | 2500 | 406,4 | 16.00 | 12† | 0.51 |

†Maximum negative pressure for -06 and larger are suitable for hose which has suffered no external damage or kinking. If greater negative pressures are required for -06 and larger hoses, the use of an internal support coil is recommended. Use of an internal support coil in -06 and larger PTFE hose is recommended for tube support where extended or continuous service at high temperature together with low or negative pressure is expected.



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**2566** | One Textile braid

**Typical Application**

For diesel,lubricating oils, air and water

| | |
|---|---|
| **Agency Specifcation:** | DNV / MSHA / 20R2 TYPE 1 |
| **Hose Construction:** | Inner Tube Elastomer / Reinforcement Textile / Cover Elastomer |
| **Operating Temperature:** | -40°C to +100°C |
| **Qualified Fittings:** | Socketless |

| Part Number | | | 2556 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 4 | 0.25 | 0.49 | 25,0 | 360 | 99,0 | 1440 | 76,2 | 3.00 | 28 | 0.12 |
| 6 | 0.38 | 0.62 | 21,0 | 300 | 84,0 | 1200 | 76,2 | 3.00 | 28 | 0.18 |
| 8 | 0.50 | 0.75 | 21,0 | 300 | 84,0 | 1200 | 127,0 | 5.00 | 28 | 0.22 |
| 10 | 0.63 | 0.91 | 17,0 | 250 | 70,0 | 1000 | 152,4 | 6.00 | 18 | 0.30 |
| 12 | 0.75 | 1.03 | 17,0 | 250 | 70,0 | 1000 | 177,8 | 7.00 | 18 | 0.42 |



AUS 11.indd 46 11/12/23 2:38 pm

**FC332** | One Textile braid

**Typical Application**

For diesel,lubricating oils, air and water

**Agency Specifcation:** ABS

**Hose Construction:**

| Inner Tube | Reinforcement | Cover |
|---|---|---|
| AQP | Textile | AQP |

**Operating Temperature:** -40°C to +150°C
Air +121°C
Water + 82°C

**Qualified Fittings:** Socketless

| Part Number | | | FC332 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 4 | 0.25 | 0.49 | 20,0 | 300 | 82,0 | 1200 | 76,2 | 3.00 | 28 | 0.12 |
| 6 | 0.38 | 0.63 | 20,0 | 300 | 82,0 | 1200 | 76,2 | 3.00 | 28 | 0.18 |
| 8 | 0.50 | 0.75 | 20,0 | 300 | 82,0 | 1200 | 127,0 | 5.00 | 28 | 0.22 |
| 10 | 0.63 | 0.91 | 20,0 | 300 | 82,0 | 1200 | 152,4 | 6.00 | 18 | 0.30 |
| 12 | 0.75 | 1.04 | 20,0 | 300 | 82,0 | 1200 | 177,8 | 7.00 | 18 | 0.42 |



AUS 11.indd 47 11/12/23 2:38 pm

**FC800** | One Wire braid

**Application**

EverCool air conditioning used with multi refrigerants R134a, R407C, HF1234yf

**Agency Specifcation:** SAE J2064

**Hose Construction:** Inner Tube Reinforcement Cover
Chloroprene Wire braid EPDM

**Operating Temperature:** -40°C to +125°C

**Qualified Fittings:** Reusables
Crimp

| Part Number | | | FC800 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 12 | 0.65 | 1.07 | 35 | 500 | 140 | 2000 | 70 | 3.00 | 28 | 0.67 |
| 16 | 0.90 | 1.24 | 35 | 500 | 140 | 2000 | 80 | 3.50 | 28 | 0.71 |
| 20 | 1.15 | 1.52 | 35 | 500 | 140 | 2000 | 100 | 4.00 | 28 | 0.92 |
| 24 | 1.40 | 1.80 | 35 | 500 | 140 | 2000 | 160 | 6.50 | 28 | 1.16 |



AUS 11.indd 48 11/12/23 2:38 pm

**GH001** One Wire braid

**Typical Application**

EverCool air conditioning used with multi refrigerants R134a, R407C, HF1234yf & R4 10

**Agency Specifcation:** SAE J2064 TYPE E

**Hose Construction:**

| Inner Tube | Reinforcement | Cover |
|---|---|---|
| Polymide | PVA | EPDM |

**Operating Temperature:** -40°C to +140°C

**Qualified Fittings:** E-Z Clip

| Part Number | | | GH001 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 4 | 0.19 | 0.46 | 500 | | 2000 | | 38.1 | 1.50 | | 0.10 |
| 6 | 0.31 | 0.58 | 500 | | 2000 | | 50.0 | 2.00 | | 0.14 |
| 8 | 0.41 | 0.70 | 500 | | 2000 | | 63.0 | 2.50 | | 0.18 |
| 10 | 0.50 | 0.78 | 500 | | 2000 | | 76.2 | 3.00 | | 0.22 |
| 12 | 0.63 | 0.98 | 500 | | 2000 | | 101.6 | 4.00 | | 0.27 |
| 16 | 0.88 | 1.23 | 500 | | 2000 | | 127.0 | 7.00 | | 0.43 |



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**FBA** | One Wire braid

**Typical Application**

AQP Racing Hose used for fuels, lube, coolant and air

**Agency Specifcation:**

| | Inner Tube | Reinforcement / Cover |
|---|---|---|
| **Hose Construction:** | AQP | Stainless Steel |

**Operating Temperature:** -49°C to +150°C

**Qualified Fittings:** Reusable, Crimp

| Part Number | | | FBA | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 0400 | 0.22 | 0.44 | | 1000 | | | | 2.00 | 21 | 0.16 |
| 0600 | 0.34 | 0.55 | | 1000 | | | | 2.50 | 21 | 0.24 |
| 0800 | 0.44 | 0.65 | | 1000 | | | | 3.50 | 21 | 0.25 |
| 1000 | 0.56 | 0.80 | | 1000 | | | | 4.00 | 28 | 0.31 |
| 1200 | 0.69 | 0.94 | | 1000 | | | | 4.50 | 28 | 0.43 |
| 1600 | 0.88 | 1.15 | | 750 | | | | 5.50 | 28 | 0.57 |
| 2000 | 1.13 | 1.41 | | 500 | | | | 8.00 | 21 | 0.57 |
| 2400 | 1.34 | 1.70 | | 50 | | | | 9.00 | 21 | 0.57 |
| 3200 | 1.75 | 2.09 | | 50 | | | | 12.50 | 15 | 1.46 |



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## FC598 | One Textile braid

**Typical Application**

For diesel,lubricating oils, air and water

| | |
|---|---|
| **Agency Specifcation:** | 100R6 |
| **Hose Construction:** | Inner Tube: AQP; Reinforcement: Textile; Cover: AQP |
| **Operating Temperature:** | -40°C to +150°C<br>Air +121°C<br>Water + 82°C |
| **Qualified Fittings:** | Socketless |

| Part Number | | | FC598 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 4 | 0.25 | 0.50 | 28 | 400 | 112 | 1600 | 63.5 | 2.50 | 28 | 0.12 |
| 6 | 0.38 | 0.62 | 28 | 400 | 112 | 1600 | 75.0 | 3.00 | 28 | 0.19 |
| 8 | 0.50 | 0.78 | 28 | 400 | 112 | 1600 | 100.0 | 4.00 | 28 | 0.22 |
| 10 | .0.63 | 0.91 | 24 | 350 | 98 | 1400 | 125 | 5.00 | 18 | 0.30 |
| 12 | 0.75 | 1.03 | 24 | 350 | 98 | 1400 | 150 | 6.00 | 18 | 0.42 |



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## FC234 | One Textile braid

**Typical Application**

Hose has a refractory cover. Used for diesel fuel, gasoline, hot lube oil & water

**Agency Specifcation:** DNV / MSHA / USCG / J I527

**Hose Construction:** Inner Tube Reinforcement Cover
AQP BRASS/STEEL AQP

**Operating Temperature:** -40°C to +150°C

**Qualified Fittings:** R5 Reusable
Crimp

| Part Number | | | FC234 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 5 | 0.25 | 0.58 | 105,0 | 1500 | 420,0 | 6000 | 25,4 | 1.00 | 28 | 0.33 |
| 6 | 0.31 | 0.68 | 105,0 | 1500 | 420,0 | 6000 | 31,8 | 1.25 | 28 | 0.37 |
| 8 | 0.41 | 0.76 | 87,0 | 1250 | 350,0 | 5000 | 44,5 | 1.75 | 28 | 0.45 |
| 10 | 0.50 | 0.94 | 87,0 | 1250 | 350,0 | 5000 | 57,2 | 2.25 | 28 | 0.67 |
| 12 | 0.63 | 1.08 | 52,0 | 750 | 210,0 | 3000 | 69,9 | 2.75 | 20 | 0.72 |
| 16 | 0.88 | 1.24 | 52,0 | 400 | 112,0 | 1600 | 88,9 | 3.50 | 16 | 0.76 |



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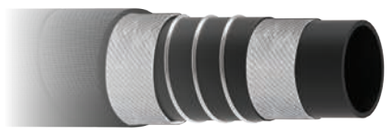
**Premium hose**
**FC619**



Suction

# FC619 | Premium suction one wire braided hose

**Exceeds:** SAE 100R4 | EN 45545

Aeroquip by Danfoss | FC619-12 | 19.0 mm (0.75 in) DN19 | Exceeds SAE 100R4 • ABS MSHA IC-84/19 • EN 45545 | 21 BAR (305 PSI) | -40°C to +135°C -40°F to +275°F | 1/3 BEND | 4S • 1A 1G

**Typical application:**

Suction and transfer applications for petroleum hydraulic fluids, fuel, lubricating oils, gasoline, water and many other industrial fluids

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA \| ABS | | |
| **Hose construction:** | **Inner Tube:** AQP | **Reinforcement:** Helical wire between two textile reinforcement layers | **Cover:** Nitrile |
| **Operating temperature:** | -40°C to +135°C (-40°F to +275°F) | | |
| **Qualified fittings:** | 1A Series (-12 to -32) \| 4S Series (-12)<br>1G Series (-12 to -32) | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | VACUUM | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Vacuum Service | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft | kg/m | lbs/ft |
| **FC619-12** | 19,0 | 0.75 | 30,0 | 1.18 | 21,0 | 305 † | 84,0 | 1,200 | 40,0 | 1.57 | 94,8 | 28 | 0,65 | 0.44 |
| **FC619-16** | 25,4 | 1.00 | 37,1 | 1.46 | 17,0 | 245† | 68,0 | 1,000 | 45,0 | 1.77 | 94,8 | 28 | 0,77 | 0.52 |
| **FC619-20** | 31,8 | 1.25 | 44,8 | 1.76 | 14,0 | 205 † | 56,0 | 820 | 60,0 | 2.36 | 94,8 | 28 | 1,12 | 0.75 |
| **FC619-24** | 38,1 | 1.50 | 51,2 | 2.01 | 10,5 | 150 † | 42,0 | 600 | 65,0 | 2.56 | 94,8 | 28 | 1,26 | 0.85 |
| **FC619-32** | 50,8 | 2.00 | 64,8 | 2.55 | 7,0 | 100 † | 28,0 | 400 | 100,0 | 3.94 | 94,8 | 28 | 1,73 | 1.16 |
| **FC619-40** | 63,5 | 2.50 | 77,7 | 3.06 | 4,0 | 60 † | 16,0 | 240 | 140,0 | 5.51 | 94,8 | 28 | 2,35 | 1.58 |
| **FC619-48** | 76,2 | 3.00 | 92,5 | 3.64 | 4,0 | 60 † | 16,0 | 240 | 279,4 | 11.00 | 94,8 | 28 | 3,36 | 2.26 |

† Maximum working pressure for band clamp type fittings is 3,4 bar [50 psi].



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Standard

# WH004

Winner
suction & return hose

**Exceeds:** SAE 100R4 performance

**Winner** by Danfoss **WH004-12** | 19 mm (0.75 in) DN19 | Exceeds SAE 100R4 PERFORMANCE MSHA IC-261/5 | 21 BAR (305 PSI) | -40°C to +100°C -40°F to +212°F | Half Bend | 1A • Z 1G • 2 pc

**Typical application:**

Suitable for use in suction applications for hydraulics, crude fuel, lubricating oils, gasoline, air, water and chemical transfer

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA | | |
| **Hose construction:** | **Inner Tube:** Oil-resistant NBR | **Reinforcement:** Textile with helical & anti-static wire | **Cover:** Nitrile |
| **Operating temperature:** | -40°C to +100°C (-40°F to +212°F) | | |
| **Qualified fittings/socket:** | Fittings: • 1A and 1G: -12, -16, -20, -24 and -32<br>• 4T Optimum & Winner 2 pc Series: -12 and -16<br>• Hose barb with band clamps: -12 thru -48 with a reduced operating pressure rating of 4 bar (60 psi)<br>Socket: 03310 (pg 173) | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | VACUUM` | | WEIGH`T | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Vacuum | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kPa | in/Hg | kg/m | lbs/ft |
| **WH004-12** | 19.0 | 0.75 | 28,6 | 1.13 | 21 | 305 | 84 | 1220 † | 40 | 1.57 | 94.8 | 28 | 0,54 | 0.36 |
| **WH004-16** | 25.4 | 1.00 | 35,2 | 1.39 | 17 | 245 | 68 | 980 † | 45 | 1.77 | 94.8 | 28 | 0,68 | 0.46 |
| **WH004-20** | 31.8 | 1.25 | 42,0 | 1.65 | 14 | 205 | 56 | 820 † | 60 | 2.36 | 94.8 | 28 | 0,85 | 0.57 |
| **WH004-24** | 38.1 | 1.50 | 49,2 | 1.94 | 10.5 | 150 | 42 | 600 † | 65 | 2.56 | 94.8 | 28 | 1,20 | 0.81 |
| **WH004-32** | 50.8 | 2.00 | 62,0 | 2.44 | 7 | 100 | 28 | 400 † | 100 | 3.94 | 94.8 | 28 | 1,53 | 1.03 |
| **WH004-40** | 63.5 | 2.50 | 75,5 | 2.97 | 4 | 60 | 16 | 240 † | 140 | 5.51 | 94.8 | 28 | 2,05 | 1.38 |
| **WH004-48** | 76.2 | 3.00 | 88,0 | 3.46 | 4 | 60 | 16 | 240 † | 180 | 7.09 | 94.8 | 28 | 2,62 | 1.76 |

† Maximum working pressure for band clamp type fittings is 3,4 bar [50 psi]



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# FC579

Premium Hi-impulse jack two wire braided hose

**Meets:** IJ100

Aeroquip by Danfoss | FC579-04 | 6.4 mm (0.25 in) DN6 | Dura-Tuff | MSHA IC-84/19 | 690 BAR (10000 PSI) | -40°C to +49°C -40°F to +120°F | 1A

**Typical application:**

Hydraulic jacking system service with petroleum and water-based fluids

Meets the performance requirements of the Material Handling Institute Specification IJ100

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA | | |
| **Hose construction:** | **Inner Tube:** Nitrile | **Reinforcement:** Two wire braid | **Cover:** Dura-Tuff premium abrasion |
| **Operating temperature:** | -40°C to +49°C (-40°F to +120°F) | | |
| **Qualified fittings:** | 1A Series | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **FC579-04** | 6,4 | 0.25 | 14,1 | 0.56 | 690,0 | 10,000 | 1380,0 | 20,000 | 50,8 | 2.00 | 0,33 | 0.22 |
| **FC579-06** | 9,5 | 0.38 | 19,2 | 0.76 | 690,0 | 10,000 | 1380,0 | 20,000 | 63,5 | 2.50 | 0,57 | 0.38 |

**3TR7** | One Textile braid/ Perforated cover

**Typical Application**

For hydraulics, material handling, high pressure gases & chemical transfer

| | |
|---|---|
| **Agency Specifcation:** | 100R7 |
| **Hose Construction:** | Inner Tube Reinforcement Cover<br>Nylon Textile Polyurathane |
| **Operating Temperature:** | -40°C to +100°C Oil based fluids<br>40°C to +66°C Water based fluids |
| **Qualified Fittings:** | Crimp - 4T fittings<br>Crimp - TTC / Sleeve |

| Part Number | | | 3TR7 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 4 | 0.25 | 0.49 | 192 | 2800 | 759 | 11000 | 31.8 | 1.25 | | 0.09 |
| 5 | 0.31 | 0.57 | 175 | 2550 | 690 | 10000 | 38.1 | 1.50 | | 0.13 |
| 6 | 0.38 | 0.65 | 157 | 2300 | 621 | 9000 | 50.8 | 2.00 | | 0.15 |
| 8 | 0.50 | 0.82 | 140.0 | 2050 | 621 | 9000 | 69.9 | 2.75 | | 0.21 |
| 10 | 0.63 | 0.93 | 105 | 1525 | 421 | 6100 | 101.6 | 4.00 | | 0.24 |
| 12 | 0.75 | 1.04 | 87 | 1250 | 348 | 5000 | 108.0 | 4.25 | | 0.26 |
| 16 | 1.00 | 1.33 | 70 | 1000 | 280 | 4000 | 190.5 | 7.50 | | 0.40 |



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**3TR7N** | One Textile braid / Non Conductive

**Typical Application**

Suitable for use in elecric utility trucks, hydraulic systems and mobile equipment.

**Agency Specifcation:** 100R7 / 92.2 ANSI - Sizes -4 to -10

**Hose Construction:** Inner Tube Nylon | Reinforcement Cover Textile | Cover Polyurathane

**Operating Temperature:** -40°C to +100°C Oil based fluids
40°C to +66°C Water based fluids

**Qualified Fittings:** Crimp - 4T fittings
Crimp - TTC / Sleeve

| Part Number | | | 3TR7N | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 4 | 0.25 | 0.49 | 207 | 3000 | 759 | 11000 | 31.8 | 1.25 | | 0.09 |
| 5 | 0.31 | 0.57 | 207 | 3000 | 690 | 10000 | 38.1 | 1.50 | | 0.13 |
| 6 | 0.38 | 0.65 | 207 | 3000 | 621 | 9000 | 50.8 | 2.00 | | 0.15 |
| 8 | 0.50 | 0.82 | 207 | 3000 | 621 | 9000 | 69.9 | 2.75 | | 0.21 |
| 10 | 0.63 | 0.93 | 140 | 2050 | 421 | 6100 | 101.6 | 4.00 | | 0.24 |
| 12 | 0.75 | 1.04 | 86 | | 348 | 5000 | 108.0 | 4.25 | | 0.26 |
| 16 | 1.00 | 1.33 | 69 | | 280 | 4000 | 190.5 | 7.50 | | 0.40 |



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**3TR8** | Two Textile braid/ Perforated cover

**Typical Application**

For hydraulics, material handling, high pressure gases & chemical transfer

| | |
|---|---|
| **Agency Specifcation:** | 100R8 |
| **Hose Construction:** | Inner Tube Reinforcement Cover<br>Nylon Textile Polyurathane |
| **Operating Temperature:** | -40°C to +100°C Oil based fluids<br>40°C to +66°C Water based fluids |
| **Qualified Fittings:** | Crimp - 4T fittings<br>Crimp - TTC / Sleeve<br>except -4 size |

| Part Number | | | 3TR8 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 4 | 0.25 | 0.59 | 350 | 5100 | 1400 | 20400 | 38.1 | 1.50 | | 0.16 |
| 6 | 0.38 | 0.75 | 280 | 4500 | 1120 | 18000 | 57.2 | 2.25 | | 0.23 |
| 8 | 0.50 | 0.90 | 245 | 3550 | 980 | 14200 | 76.2 | 3.00 | | 0.29 |
| 10 | 0.75 | 1.13 | 157.0 | 2300 | 628 | 9200 | 114.3 | 4.50 | | 0.38 |
| 12 | 1.00 | 1.43 | 140 | 2050 | 560 | 8200 | 196.9 | 7.75 | | 0.57 |



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**3TR8N** | Two Textile braid / Non Conductive

**Typical Application**

Suitable for use in elecric utility trucks, hydraulic systems and mobile equipment.

| | |
|---|---|
| **Agency Specifcation:** | 100R8 |
| **Hose Construction:** | Inner Tube Reinforcement Cover<br>Nylon Textile Polyurathane |
| **Operating Temperature:** | -40°C to +100°C Oil based fluids<br>40°C to +66°C Water based fluids |
| **Qualified Fittings:** | Crimp - 4T fittings<br>Crimp - TTC / Sleeve except -4 size |

| Part Number | | | 3TR8N | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 4 | 0.25 | 0.59 | 350 | 5100 | 1400 | 20400 | 38.1 | 1.50 | | 0.16 |
| 6 | 0.38 | 0.75 | 280 | 4500 | 1120 | 18000 | 57.2 | 2.25 | | 0.23 |
| 8 | 0.50 | 0.90 | 245 | 3550 | 980 | 14200 | 76.2 | 3.00 | | 0.29 |
| 12 | 0.75 | 1.13 | 157.0 | 2300 | 628 | 9200 | 114.3 | 4.50 | | 0.38 |
| 16 | 1.00 | 1.43 | 140 | 2050 | 560 | 8200 | 196.9 | 7.75 | | 0.57 |



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**3TR1CT8** | Textile braid/ Perforated cover

**Typical Application**

For forklifts, construction, general hydraulics,chemical and gas transfer, agricultural equipment, lubrication equipment and portable hydraulic tools

**Agency Specifcation:** 100R18

**Hose Construction:** Inner Tube Reinforcement Cover
Polyester Textile Polyurathane

**Operating Temperature:** -54°C to +100°C Oil based fluids
54°C to +66°C Water based fluids

**Qualified Fittings:** Crimp - 4T fittings

| Part Number | | | 3TR18CT | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 4 | 0.25 | 0.48 | 210 | 3050 | 840 | 12200 | 31.8 | 1.25 | | 0.09 |
| 5 | 0.31 | 0.56 | 210 | 3050 | 840 | 12200 | 38.1 | 1.50 | | 0.15 |
| 6 | 0.38 | 0.66 | 210 | 3050 | 840 | 12200 | 50.8 | 2.00 | | 0.16 |
| 8 | 0.50 | 0.85 | 210 | 3050 | 840 | 12200 | 69.9 | 2.75 | | 0.25 |
| 10 | .0.63 | 1.06 | 210 | 3050 | 840 | 12200 | 101.6 | 4.00 | | 0.41 |



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# EC230

Premium large bore
two wire braided hose

**Exceeds:** SAE 100R2

| Aeroquip by Danfoss | EC230-40 | 63.5 mm (2.50 in) DN60 | Dura-Tuff | Exceeds SAE 100R2 Performance MSHA IC-84/19 | 79 BAR (1150 PSI) | -40°C to +100°C -40°F to +212°F |
|---|---|---|---|---|---|---|

**Typical application:**

Hydraulic system service with petroleum and waterbased fluids, for general industrial service

| | | | |
|---|---|---|---|
| **Agency specifications:** | MSHA | | |
| **Hose construction:** | **Inner Tube:** Nitrile | **Reinforcement:** Two wire briad | **Cover:** Dura-Tuff premium abrasion |
| **Operating temperature:** | -40°C to +100°C (-40°F to +212°F) | | |
| **Qualified fittings:** | For fitting information, refer to Danfoss bulletin E-HOBR-BB001-E. | | |

| PART | SIZE DIMENSIONS | | | | PRESSURE | | | | BEND | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Hose I.D. | | Hose O.D. (nominal) | | Working Pressure | | Min. Burst Pressure | | Min. Bend Radius | | Weight | |
| | mm | in | mm | in | bar | psi | bar | psi | mm | in | kg/m | lbs/ft |
| **EC230-40** | 63,5 | 2.50 | 78,6 | 3.09 | 79,0 | 1,150 | 316,0 | 4,600 | 660,0 | 26.00 | 3,88 | 2.61 |





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## EC155 | Four Textile braid

**Typical Application**

Railway airbrake systems to connect carriages via half couplings according to DIN 15807 ; 2011

**Agency Specifcation:** UIC830-1 / EN15807 / EN45545-2

| **Hose Construction:** | Inner Tube | Reinforcement | Cover |
|---|---|---|---|
| | Rubber | Textile | Rubber |

**Operating Temperature:** -40°C to +70°C

**Qualified Fittings:** Refer Danfoss

| Part Number | | | EC155 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 8 | 0.51 | 0.98 | 400 | | 1600 | | 100 | | | 0.38 |
| 10 | 0.63 | 1.10 | 350 | | 1400 | | 115.0 | | | 0.43 |
| 14 | 0.87 | 1.42 | 330 | | 1320 | | 130.0 | | | 0.54 |
| 18A | 1.10 | 1.69 | 275.0 | | 1100 | | 180 | | | 0.64 |
| 22 | 1.38 | 2.09 | 250 | | 1000 | | 200 | | | 0.75 |



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## EHA509/EHA510 / One Textile Braid

**Typical Application**

Multipurpose EPDM hose for construction, mining, rental idustry, oil and gas exploration and in-plant air service.

**Agency Specifcation:**

**Hose Construction:** Inner Tube Rubber; Reinforcement Textile; Cover Rubber

**Operating Temperature:** -40°C to +120°C

**Qualified Fittings:** Quick Disconnect Coupling; Male barb inserts

| Part Number | | | EHA509 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 4 | 0.25 | 0.43 | 10.50 | 150 | 31 | 450 | | | | 0.03 |
| 5 | 0.31 | 0.55 | 10.50 | 150 | 31 | 450 | | | | 0.05 |
| 6 | 0.38 | 0.63 | 10.50 | 150 | 31 | 450 | | | | 0.07 |
| 8 | 0.50 | 0.79 | 10.50 | 150 | 31 | 450 | | | | 0.08 |
| 10 | 0.62 | 0.91 | 10.50 | 150 | 31 | 450 | | | | 0.10 |
| 12 | 0.75 | 1.06 | 10.50 | 150 | 31 | 450 | | | | 0.12 |
| 16 | 1.00 | 1.34 | 10.50 | 150 | 31 | 450 | | | | 0.15 |



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## FC613 | One Wire braid

**Typical Application**

For fire suppression, mining vehicles

**Agency Specifcation:** 100R1AT / MSHA

**Hose Construction:**

| Inner Tube | Reinforcement | Cover |
|---|---|---|
| Rubber | Wire | Rubber |

**Operating Temperature:** -40°C to +100°C

**Qualified Fittings:** Crimp TTC

| Part Number | | | FC613 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| 4 | 0.35 | 0.53 | 187 | 2750 | 748 | 11000 | 102 | 4.00 | | 0.16 |
| 6 | 0.38 | 0.69 | 153 | 2250 | 612 | 9000 | 127 | 5.00 | | 0.25 |
| 8 | 0.50 | 0.81 | 136 | 2000 | 544 | 8000 | 178 | 7.00 | | 0.30 |
| 12 | 0.75 | 1.09 | 85 | 1250 | 340 | 5000 | 241 | 9.50 | | 0.45 |



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## FC250H | One Wire braid

**Typical Application**

Hydraulics, fuel and lubricating oils, air and water

**Agency Specifcation:** DNV-GL / ABS / USCG

**Hose Construction:**

| Inner Tube | Reinforcement | Cover |
|---|---|---|
| CPE | Wire | Textile |

**Operating Temperature:** -49°C to +150°C
Except air +121°C

**Qualified Fittings:** Crimp Refer Danfoss

| Part Number | | | FC250H | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash Size | Hose I.D. (inches) | Hose O.D (inches) | Maximum operating pressure (bar) | Maximum operating pressure (psi) | Minimum burst pressure (bar) | Minimum burst pressure (psi) | Minimum bend radius (mm) | Minimum bend radius (inches) | Vacuum service (in./Hg) | Weight (kg/m) |
| **4** | 0.19 | 0.45 | 210 | 3050 | 748 | 12200 | 38 | 1.50 | | 0.11 |
| **6** | 0.31 | 0.57 | 157 | 2300 | 612 | 9200 | 50 | 1.97 | | 0.14 |
| **8** | 0.41 | 0.67 | 140 | 2050 | 544 | 8200 | 58 | 2.28 | | 0.17 |
| **10** | 0.50 | 0.77 | 122 | 1750 | 340 | 7000 | 70 | 2.75 | | 0.21 |
| **12** | 0.62 | 0.90 | 105 | 1500 | 340 | 6000 | 80 | 3.15 | | 0.25 |
| **16** | 0.88 | 1.16 | 56 | 800 | 340 | 3200 | 90 | 3.54 | | 0.32 |



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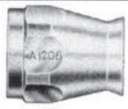
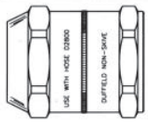
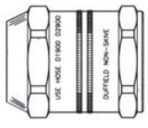
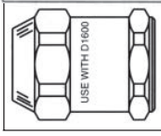
## Reusable Socket Data—Socket to hose correction combinations

Use of the correct Aeroquip socket with a given Aeroquip hose is essential for proper assembly and performance. Virtually all Aeroquip hose sockets are marked with the socket part number and dash size. Using this number, from the table below, the correct hose or hoses may be found and dash sizes matched, to assure the correct combination.

| Reusable sockets | Socket base part number | Aeroquip hose base part number | Dash sizes |
|---|---|---|---|
|  | 1206 | 2807, FC186, FC465 | all |
| | 1208 | 2808 | all |
| | 1210 | 303, 1503, 1540, 2580, 2651, FC234, FC300, FC321, FC350, FC355, FC558, FC802 | –4 to –12 |
| | 1212 | 302A, 1503, 1540, 2580, 2651, FC234, FC300, FC321, FC350, FC355, FC558 | –16 to –48 |
| | 1214 | 2550, 2554, 2555, 2570 | all |
| | 1219 | 1531, 1531A | all |
| | 4007 | FC136 GH493 | –6, –12 |
| | 4010 | 1529 | –4 to –12 –20 to –32 |
| | | 2766 | –4 to –12 –20 to –32 |
| | | 2781 | –4 to –12 –20 to –32 |
| | | FC195 | –4 to –12 –20 to –32 |

| Reusable sockets | Socket base part number | Aeroquip hose base part number | Dash sizes |
|---|---|---|---|
| | 4013 | 1529 | –16 |
| | | 2766 | –16 |
| | | 2781 | –16 |
| | | FC136 | –08, –16 |
| | | FC195 | –16 |
| | | FC324 | –08 |
| | | GH493 | –8, –16 |
| | FC2383 | FC136 GH493 | –20, –24 |
|  | RS1AT | GH663 | all |
| | FC2642 | FC310 | all |
| | | FC510 | –04 to –16 |
|  | RS2AT | GH195 GH793 | all |
| | FC1941 | FC372, FC373 | all |
|  | RS16AT | GH781 | -04 to -16 |

## BSP fittings

| BSP Fem STR | BSP Fem 45 | BSP Fem 90 | BSPP Male | BSPT Male |
|---|---|---|---|---|
| Pages C1/C2 | Pages C3/C4 | Pages C5/C6 | Pages C7 | Pages C9/C10 |

## Banjo fittings

| Banjo STR |
|---|
| Pages C8 |

## Metric light fittings

| Metric Male | Metric Fem | Metric Fem 45 | Metric Fem 90 |
|---|---|---|---|
| Pages C17/C18 | Pages C19/C20 | Pages C21/C22 | Pages C23/C24 |

## Metric heavy fittings

| Metric Fem | Metric Fem 45 | Metric Fem 90 | Metric Male |
|---|---|---|---|
| Pages C25/C26 | Pages C27/C28 | Pages C29/C30 | Pages C31/C32 |

## JIC fittings

| JIC Fem | JIC Fem 45 | JIC Fem 90 | JIC Fem Long | JIC Male |
|---|---|---|---|---|
| Pages C33/C34 | Pages C35/C36 | Pages C37/C38 | Pages C39/C40 | Pages C67/C68 |

## CAT flange fittings

CAT Flange STR

Pages C11

CAT Flange 45

Pages C12

CAT Flange 90

Pages C13

CAT Flange 22.5

Pages C14

CAT Flange 30

Pages C15

## CAT flange fittings

CAT Flange 60

Pages C16

CAT Flange 67.5

Pages C16

## JIS fittings

JIS Fem STR

Pages C71

## Komatsu fittings

Komatsu Fem

Pages C72

## Komatsu flange fittings

Komatsu Flange

Pages C73

Komatsu FL 45

Pages C73

Komatsu FL 90

Pages C75

## Male inverted flare

Male Straight

Pages C74

Male 15 Deg

Pages C74

Male 45 Deg

Pages C76

Male 90 Deg

Pages C76

## Bump tube

Female Straight

Pages C77

Female 90 Deg

Pages C77

Male Straight

Pages C77

Male 90 Deg

Pages C77

## NPT fittings

NPT Male

Pages C69/C70

## Lifesaver fittings

Lifesaver

Pages C65/C66

## Code 61 flange fittings

Code 61 STR

Pages C47/C48

Code 61 45 Deg

Pages C49/C50

Code 61 90 Deg

Pages C51/C52

Code 61 22.5 Deg

Pages C53

Code 61 67.5 Deg

Pages C56

Code 61 30 Deg

Pages C54

## Code 61 flange fittings

Code 61 60 Deg

Pages C55

## Code 62 flange fittings

Code 62 STR

Pages C41

Code 62 45 Deg

Pages C42

Code 62 90 Deg

Pages C43

## Code 62 flange fittings

Code 62 22.5 Deg

Pages C44

Code 62 30 Deg

Pages C46

Code 62 60 deg

Pages C45

## ORSF fittings

ORSF Fem

Pages C57/C58

ORSF Fem 45

Pages C59/C60

ORSF Fem 90

Pages C61/C62

ORSF Fem 90 Long

Pages C63/C64

## BF
**BSP**
**Fem swivel**

| | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|
| | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 1/4-19 | -04 | 26711-04-04Z | | 1A4BF4 | | | | | |
| 3/8-19 | -04 | 26711-06-04TZ | | 1A6BF4 | | | | | |
| 1/4-19 | -05 | | | | | | | | |
| 3/8-19 | -06 | 26711-06-06Z | | 1A6BF6 | | 4S6BF6 | | | |
| 1/2-14 | -06 | 26711-08-06TZ | | 1A8BF6 | | | | | |
| 1/2-14 | -08 | 26711-08-08Z | | 1A8BF8 | | 4S8BF8 | | | |
| 1/2-14 | -10 | 26711-08-10Z | | 1A8BF10 | | | | | |
| 5/8-14 | -08 | | | 1A10BF8 | | | | | |
| 5/8-14 | -10 | 26711-10-10Z | | 1A10BF10 | | | | | |
| 3/4-14 | -12 | | | 1A12BF10 | | | | | |
| 3/4-14 | -12 | 26711-12-12Z | | 1A12BF12 | | 4S12BF12 | | | |
| 1-11 | -16 | | | | | 4S16BF12 | | | |
| 1-11 | -16 | 26711-16-16Z | | 1A16BF16 | | 4S16BF16 | | | |
| 1 1/4-11 | -16 | | | | | 4S20BF16 | | | |
| 1 1/4-11 | -20 | 26711-20-20WZ | | 1A20BF20 | | 4S20BF20 | | | |
| 1 1/2-11 | -24 | 26711-24-24WZ | | 1A24BF24 | | 4S24BF24 | | 6S24BF24 | |
| 2-11 | -32 | 26711-32-32WZ | | 1A32BF32 | | 4S32BF32 | | 6S32BF32 | |
| 2 1/2 | -40 | | | | | | | | |



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# BF
**BSP**
**Fem swivel**

| | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 1/4-19 | -04 | DSR01-0404 | | 07.421-4-4 | | 07.390-4-4 | | 07.022-4-4 | |
| 3/8-19 | -04 | | | | | | | | |
| 1/4-19 | -05 | | | 07.421-4-5 | | | | 07.022-4-5 | |
| 3/8-19 | -06 | DSR01-0606 | | 07.421-6-6 | | 07.390-6-6 | | 07.022-6-6 | |
| 1/2-14 | -06 | DSR01-0806 | | | | | | | |
| 1/2-14 | -08 | DSR01-0808 | | 07.421-8-8 | | 07.390-8-8 | | 07.022-8-8 | |
| 1/2-14 | -10 | | | 07.421-8-10 | | | | | |
| 5/8-14 | -10 | | | | | | | | |
| 5/8-14 | -10 | | | 07.421-10-10 | | | | 07.022-10-10 | |
| 3/4-14 | -12 | | | | | | | | |
| 3/4-14 | -12 | DSR01-1212 | | 07.421-12-12 | | 07.390-12-12 | | 07.022-12-12 | |
| 1-11 | -16 | | | | | | | | |
| 1-11 | -16 | DSR01-1616 | | 07.421-16-16 | | | | 07.022-16-16 | |
| 1 1/4-11 | -16 | | | | | | | | |
| 1 1/4-11 | -20 | | | 07.421-20-20 | | | | | |
| 1 1/2-11 | -24 | | | 07.421-24-24 | | | | | |
| 2-11 | -32 | | | 07.421-32-32 | | | | | |
| 2 1/2 | -40 | | | 07.421-40-40 | | | | | |



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## BFA
**BSP**
**45° Swept**
**Fem swivel**

| | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|
| | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 1/4-19 | -04 | 22641-04-04Z | 20.2 | 1A4BFA4 | 16.5 | | | | |
| 3/8-19 | -04 | | | | | | | | |
| 1/4-19 | -05 | | | | | | | | |
| 3/8-19 | -06 | 22641-06-06Z | 22.6 | 1A6BFA6 | 19.0 | 4S6BFA6 | 19.0 | | |
| 1/2-14 | -06 | 22641-08-06Z | 22.5 | 1A8BFA6 | 23.2 | | | | |
| 1/2-14 | -08 | 22641-08-08Z | 26.1 | 1A8BFA8 | 24.8 | 4S8BFA8 | 27.0 | | |
| 1/2-14 | -10 | | | | | | | | |
| 5/8-14 | -10 | 22641-10-10Z | 27.8 | 1A10BFA10 | 27.4 | | | | |
| 3/4-14 | -12 | 22641-12-12Z | 31.8 | 1A12BFA12 | 29.4 | 4S12BFA12 | 26.0 | | |
| 1-11 | -12 | | | | | 4S16BFA12 | 30.0 | | |
| 1-11 | -16 | 22641-16-16Z | 34.2 | 1A16BFA16 | 33.2 | 4S16BFA16 | 30.0 | | |
| 1 1/4-11 | -16 | | | | | 4S20BFA16 | 34.0 | | |
| 1 1/4-11 | -20 | 22641-20-20WZ | 38.0 | 1A20BFA20 | 37.2 | 4S20BFA20 | 34.0 | | |
| 1 1/2-11 | -24 | 22641-24-24WZ | 45.5 | 1A24BFA24 | 44.1 | 4S24BFA24 | 42.4 | 6S24BFA24 | 42.4 |
| 2-11 | -32 | 22641-32-32WZ | 52.7 | 1A32BFA32 | 52.3 | 4S32BFA32 | 54.1 | 6S32BFA32 | 54.1 |



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## BFA
**BSP**
**45° Swept**
**Fem swivel**

| | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 1/4-19 | -04 | DSR51-0404 | 11.0 | 07.045-4-4 | 12.0 | | | | |
| 3/8-19 | -04 | | | | | | | | |
| 1/4-19 | -05 | | | | | | | | |
| 3/8-19 | -06 | DSR51-0606 | 12.5 | 07.045-6-6 | 14.4 | | | | |
| 1/2-14 | -06 | | | | | | | | |
| 1/2-14 | -08 | DSR51-0808 | 16.3 | 07.045-8-8 | 15.0 | 07.422-8-8 | 15.0 | | |
| 1/2-14 | -10 | | | | | | | | |
| 5/8-14 | -10 | | | | | 07.422-10-10 | 16.5 | | |
| 3/4-14 | -12 | DSR51-1212 | 21.0 | 07.045-12-12 | 22.6 | | | | |
| | | | | | | | | | |
| 1-11 | -16 | DSR51-1616 | 25.0 | 07.045-16-16 | 32.4 | | | | |
| | | | | | | | | | |
| 1 1/4-11 | -20 | | | 07.045-20-20 | 24.3 | | | | |
| 1 1/2-11 | -24 | | | 07.045-24-24 | 29.6 | | | | |
| 2-11 | -32 | | | 07.045-32-32 | 36.8 | | | | |



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## BFB
**BSP Fem**
**90° Swept**
**Fem swivel**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 1/4-19 | -04 | 22691-04-04Z | 36.5 | 1A4BFB4 | 24.8 | | | | |
| 1/4-19 | -05 | 22691-04-05Z | 39.5 | | | | | | |
| 3/8-19 | -06 | 22691-06-06Z | 43.0 | 1A6BFB6 | 35.0 | 4S6BFB6 | 35.0 | | |
| 1/2-14 | -06 | 22691-08-06TZ | 41.8 | 1A8BFB6 | 47.8 | | | | |
| 1/2-14 | -08 | 22691-08-08Z | 51.0 | 1A8BFB8 | 37.5 | 4S8BFB8 | 27.0 | | |
| 5/8-14 | -08 | 22691-10-08Z | 51.5 | 1A10BFB8 | 56.3 | | | | |
| 5/8-14 | -10 | 22691-10-10Z | 56.0 | 1A10BFB10 | 56.3 | | | | |
| 3/4-14 | -12 | 22691-12-12Z | 66.0 | 1A12BFB12 | 47.5 | 4S12BFB12 | 57.0 | | |
| 1-11 | -12 | 22691-16-12TZ | 63.8 | | | 4S16BFB12 | 68.0 | | |
| 1-11 | -16 | 22691-16-16Z | 73.8 | 1A16BFB16 | 71.5 | 4S16BFB16 | 68.0 | | |
| 1 1/4-11 | -16 | | | | | 4S20BFB16 | 79.0 | | |
| 1 1/4-11 | -20 | 22691-20-20WZ | 84.3 | 1A20BFB20 | 82.5 | 4S20BFB20 | 79.0 | | |
| 1 1/2-11 | -24 | 22691-24-24WZ | 103.0 | 1A24BFB24 | 97.1 | 4S24BFB24 | 98.6 | 6S24BFB24 | 98.6 |
| 2-11 | -32 | 22691-32-32WZ | 123.3 | 1A32BFB32 | 121.0 | 4S32BFB32 | 125.3 | 6S32BFB32 | 125.3 |



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## BFB
**BSP Fem**
**90° Swept**
**Fem swivel**

| | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 1/4-19 | -04 | DSR50-0404 | 36.5 | 07.011-4-4 | 22.2 | 07.140-4-4 | 22.0 | 07.339-4-4 | 22.2 |
| 1/4-19 | -05 | | | | | | | | |
| 3/8-19 | -06 | DSR50-0606 | 43.0 | 07.011-6-6 | 28.5 | 07.140-6-6 | 28.5 | 07.339-6-6 | 28.5 |
| 1/2-14 | -06 | | | | | | | | |
| 1/2-14 | -08 | DSR50-0808 | 51.0 | 07.011-8-8 | 31.8 | 07.140-8-8 | 32.0 | 07.339-8-8 | 31.8 |
| 1/2-14 | -10 | | | | | | | | |
| 5/8-14 | -10 | | | 07.011-10-10 | 35.9 | 07.140-10-10 | 36.0 | 07.339-10-10 | 36.0 |
| 3/4-14 | -12 | DSR50-1212 | 66.1 | 07.011-12-12 | 55.6 | 07.140-12-12 | 50.5 | 07.339-12-12 | 55.7 |
| | | | | | | | | | |
| 1-11 | -16 | DSR50-1616 | 73.8 | 07.011-16-16 | 69.2 | | | 07.339-16-16 | 69.2 |
| | | | | | | | | | |
| 1 1/4-11 | -20 | | | 07.011-20-20 | 62.8 | | | 07.339-20-20 | 78.8 |
| 1 1/2-11 | -24 | | | 07.011-24-24 | 74.1 | | | | |
| 2-11 | -32 | | | 07.011-32-32 | 101.0 | | | | |



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## BP
**BSP Male**
**Parallel**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 1/8-27 | -04 | 12611A-02-04Z | | | | | | | |
| 1/4-19 | -04 | 12611A-04-04Z | | 1A4BP4 | | | | | |
| 3/8-19 | -06 | 12611A-06-06Z | | 1A6BP6 | | | | | |
| 1/2-14 | -06 | 12611A-08-06Z | | | | | | | |
| 1/2-14 | -08 | 12611A-08-08Z | | 1A8BP8 | | | | | |
| 3/4-14 | -12 | 12611A-12-12Z | | 1A12BP12 | | 4S12BP12 | | | |
| 1-11 | -16 | 12611A-16-16Z | | 1A16BP16 | | 4S16BP16 | | | |
| 1 1/4-11 | -20 | 12611A-20-20Z | | 1A20BP20 | | 4S20BP20 | | | |
| 1 1/2-11 | -24 | 12611A-24-24Z | | 1A24BP24 | | | | | |
| 2-11 | -32 | | | 1A32BP32 | | | | | |



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## BJ
**Banjo**

| | Winner Braided Hose | Braided Hose | Four Spiral Hose | Six Spiral Hose |
|---|---|---|---|---|
| | Two Piece Fittings | TTC | 4S | 6S |
| | EC215<br>USE 03310-SIZE SOCKETS | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 |
| | | | | |

| Diameter | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
|---|---|---|---|---|---|---|---|---|---|
| 10 | -04 | | | | | | | | |
| 12 | -04 | | | 1A6BJ4 | | | | | |
| 14 | -06 | | | 1A8BJ6 | | | | | |
| 16 | -06 | | | 1A10BJ6 | | | | | |

## BJ
**Banjo**

| | Reusable | | | |
|---|---|---|---|---|
| | 1 & 2 wire | SAE100R5 | Socketless | Teflon |
| | GH781 GH195<br>EC215 | FC350 FC300<br>FC234 | FC332 FC598<br>2556 | 2807 |
| | | | | |

| Diameter | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
|---|---|---|---|---|---|---|---|---|---|
| 10 | -4 | | | 11.027-4-4 | | 11.057-4-4 | | | |
| 12 | -4 | | | | | 11.057-6-4 | | | |
| 14 | -6 | | | 11.027-8-6 | | 11.057-8-6 | | | |
| 16 | -6 | | | | | 11.057-10-6 | | | |
| 18 | -8 | | | | | 11.057-13-8 | | | |
| 22 | -10 | | | | | 11.057-16-10 | | | |
| 26 | -12 | | | | | 11.057-20-12 | | | |



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## BT
**BSPT Male**

| | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|
| | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 1/8-27 | -04 | 13011-02-04SPZ | | 1A2BT4 | | | | | |
| 1/4-19 | -04 | 13011-04-04SPZ | | 1A4BT4 | | | | | |
| 1/4-19 | -06 | 13011-04-06SPZ | | | | | | | |
| 3/8-19 | -06 | 13011-06-06SPZ | | 1A6BT6 | | | | | |
| 1/2-14 | -06 | 13011-08-06SPZ | | 1A8BT6 | | | | | |
| 3/8-19 | -08 | 13011-06-08SPZ | | 1A6BT8 | | | | | |
| 1/2-14 | -08 | 13011-08-08SPZ | | 1A8BT8 | | | | | |
| 1/2-14 | -10 | | | 1A8BT10 | | | | | |
| 3/4-14 | -10 | 13011-12-10SPZ | | 1A12BT10 | | | | | |
| 3/4-14 | -12 | 13011-12-12SPZ | | 1A12BT12 | | 4S12BT12 | | | |
| 1-11 | -12 | 13011-16-12SPZ | | 1A16BT12 | | | | | |
| 3/4-14 | -16 | | | 1A12BT16 | | | | | |
| 1-11 | -16 | 13011-16-16SPZ | | 1A16BT16 | | 4S16BT16 | | | |
| 1 1/4-11 | -20 | 13011-20-20SPZ | | 1A20BT20 | | 4S20BT20 | | | |
| 1 1/2-11 | -24 | 13011-24-24SPZ | | 1A24BT24 | | | | | |
| 2-11 | -32 | 13011-32-32SPZ | | 1A32BT32 | | | | | |



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## BT
### BSPT Male

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 1/8-27 | -04 | DSR02-0204 | | | | | | | |
| 1/4-19 | -04 | DSR02-0404 | | 07.545-4-4 | | 351-4 | | | |
| 1/4-19 | -06 | DSR02-0406 | | | | 351-4-6 | | | |
| 3/8-19 | -06 | DSR02-0606 | | 07.545-6-6 | | 351-6 | | | |
| 1/2-14 | -06 | DSR02-0806 | | | | | | | |
| | | | | | | | | | |
| 1/2-14 | -08 | DSR02-0808 | | 07.545-8-8 | | 351-8 | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 3/4-14 | -12 | DSR02-1212 | | 07.545-12-12 | | 351-12 | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 1-11 | -16 | DSR02-1616 | | 07.545-16-16 | | | | | |
| | | | | | | | | | |
| 1 1/4-11 | -20 | | | 07.545-20-20 | | | | | |
| 1 1/2-11 | -24 | | | 07.545-24-24 | | | | | |
| 2-11 | -32 | | | 07.545-32-32 | | | | | |



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## CT
### CAT Flange

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -12 | -12 | | | | | 4S12CT12 | | | |
| -16 | -12 | | | | | 4S16CT12 | | | |
| -16 | -16 | | | | | 4S16CT16 | | 6S16CT16 | |
| -20 | -16 | | | | | 4S20CT16 | | 6S20CT16 | |
| -20 | -20 | | | | | 4S20CT20 | | 6S20CT20 | |
| -24 | -20 | | | | | 4S24CT20 | | 6S24CT20 | |
| -24 | -24 | | | | | 4S24CT24 | | 6S24CT24 | |
| -32 | -24 | | | | | 4S32CT24 | | 6S32CT24 | |
| -32 | -32 | | | | | 4S32CT32 | | 6S32CT32 | |



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## CTA
### CAT Flange
### 45 Deg

| | Winner Braided Hose | Braided Hose | Four Spiral Hose | Six Spiral Hose |
|---|---|---|---|---|
| | Two Piece Fittings | TTC | 4S | 6S |
| | EC215<br>USE 03310-SIZE SOCKETS | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 |
| | | | | |

| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
|---|---|---|---|---|---|---|---|---|---|
| -12 | -12 | | | | | 4S12CTA12 | 30.9 | | |
| -16 | -12 | | | | | 4S16CTA12 | 35.3 | | |
| -16 | -16 | | | | | 4S16CTA16 | 35.3 | 6S16CTA16 | 35.3 |
| -20 | -16 | | | | | 4S20CTA16 | 41.8 | 6S20CTA16 | 41.8 |
| -20 | -20 | | | | | 4S20CTA20 | 41.8 | 6S20CTA20 | 41.8 |
| -24 | -20 | | | | | 4S24CTA20 | 46.2 | 6S24CTA20 | 46.20 |
| -24 | -24 | | | | | 4S24CTA24 | 46.2 | 6S24CTA24 | 46.2 |
| -32 | -24 | | | | | | | 6S32CTA24 | 58.7 |
| -32 | -32 | | | | | 4S32CTA32 | 58.7 | 6S32CTA32 | 58.7 |



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## CTB
### CAT Flange
### 90 deg

| | Winner Braided Hose | Braided Hose | Four Spiral Hose | Six Spiral Hose |
|---|---|---|---|---|
| | Two Piece Fittings | TTC | 4S | 6S |
| | EC215<br>USE 03310-SIZE SOCKETS | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 |
| | | | | |

| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
|---|---|---|---|---|---|---|---|---|---|
| -12 | -12 | | | | | 4S12CTB12 | 64.7 | | |
| -16 | -12 | | | | | 4S16CTB12 | 75.7 | | |
| -16 | -16 | | | | | 4S16CTB16 | 75.7 | 6S16CTB16 | 75.7 |
| -20 | -16 | | | | | 4S20CTB16 | 92.9 | 6S20CTB16 | 92.9 |
| -20 | -20 | | | | | 4S20CTB20 | 92.9 | 6S20CTB20 | 92.9 |
| -24 | -20 | | | | | 4S24CTB20 | 105.6 | 6S24CTB20 | 105.6 |
| -24 | -24 | | | | | 4S24CTB24 | 105.6 | 6S24CTB24 | 105.6 |
| -32 | -24 | | | | | | | 6S32CTB24 | 139.7 |
| -32 | -32 | | | | | 4S32CTB32 | 139.7 | 6S32CTB32 | 139.7 |



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## CTD
**CAT Flange**
**22.5 deg**

| | Winner Braided Hose | Braided Hose | Four Spiral Hose | Six Spiral Hose |
|---|---|---|---|---|
| | Two Piece Fittings | TTC | 4S | 6S |
| | EC215<br>USE 03310-SIZE SOCKETS | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 |
| | | | | |

| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
|---|---|---|---|---|---|---|---|---|---|
| -12 | -12 | | | | | 4S12CTD12 | 13.6 | | |
| -16 | -12 | | | | | | | | |
| -16 | -16 | | | | | 4S16CTD16 | 15.3 | 6S16CTD16 | 15.3 |
| -20 | -16 | | | | | 4S20CTD16 | 17.8 | 6S20CTD16 | 17.8 |
| -20 | -20 | | | | | 4S20CTD20 | 17.8 | 6S20CTD20 | 17.8 |
| -24 | -20 | | | | | 4S24CTD20 | 19.4 | 6S24CTD20 | 19.4 |
| -24 | -24 | | | | | 4S24CTD24 | 19.4 | 6S24CTD24 | 19.4 |
| -32 | -24 | | | | | | | | |
| -32 | -32 | | | | | 4S32CTD32 | 24.2 | 6S32CTD32 | 24.2 |



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## CTF
**CAT Flange**
**30 deg**

| | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|
| | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | |
| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -12 | -12 | | | | | 4S12CTF12 | 19.1 | | |
| -16 | -12 | | | | | | | | |
| -16 | -16 | | | | | 4S16CTF16 | 21.6 | 6S16CTF16 | 21.6 |
| -20 | -16 | | | | | 4S20CTF16 | 25.3 | 6S20CTF16 | 25.3 |
| -20 | -20 | | | | | 4S20CTF20 | 25.3 | 6S20CTF20 | 25.3 |
| -24 | -20 | | | | | 4S24CTF20 | 27.70 | 6S24CTF20 | 27.70 |
| -24 | -24 | | | | | 4S24CTF24 | 27.70 | 6S24CTF24 | 27.70 |
| -32 | -24 | | | | | | | 6S32CTF24 | |
| -32 | -32 | | | | | 4S32CTF32 | 34.80 | 6S32CTF32 | 34.80 |



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## CTG
**CAT Flange**
**60 deg**

| | Winner Braided Hose | Braided Hose | Four Spiral Hose | Six Spiral Hose |
|---|---|---|---|---|
| | Two Piece Fittings | TTC | 4S | 6S |
| | EC215<br>USE 03310-SIZE SOCKETS | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 |
| | | | | |

| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
|---|---|---|---|---|---|---|---|---|---|
| -12 | -12 | | | | | 4S12CTG12 | 42.3 | | |
| -16 | -16 | | | | | 4S16CTG16 | 48.7 | 6S16CTG16 | 48.7 |
| -20 | -16 | | | | | 4S20CTG16 | 59.2 | 6S20CTG16 | 59.2 |
| -20 | -20 | | | | | 4S20CTG20 | 59.2 | 6S20CTG20 | 59.2 |
| -24 | -20 | | | | | 4S24CTG20 | 66.6 | 6S24CTG20 | 66.6 |
| -24 | -24 | | | | | 4S24CTG24 | 66.6 | 6S24CTG24 | 66.6 |
| -32 | -24 | | | | | | | 6S32CTG24 | 87.3 |
| -32 | -32 | | | | | 4S32CTG32 | 87.3 | 6S32CTG32 | 87.3 |

## CTE
**CAT Flange**
**67.5 deg**

| | Winner Braided Hose | Braided Hose | Four Spiral Hose | Six Spiral Hose |
|---|---|---|---|---|
| | Two Piece Fittings | TTC | 4S | 6S |
| | EC215<br>USE 03310-SIZE SOCKETS | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 |
| | | | | |

| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
|---|---|---|---|---|---|---|---|---|---|
| -12 | -12 | | | | | 4S12CTE12 | 48.3 | | |
| -16 | -16 | | | | | 4S16CTE16 | 55.8 | 6S16CTE16 | 55.8 |
| -20 | -16 | | | | | 4S20CTE16 | 68.1 | 6S20CTE16 | 68.1 |
| -20 | -20 | | | | | 4S20CTE20 | 68.1 | 6S20CTE20 | 68.1 |
| -24 | -20 | | | | | 4S24CTE20 | 76.8 | 6S24CTE20 | 76.8 |
| -24 | -24 | | | | | 4S24CTE24 | 76.8 | 6S24CTE24 | 76.8 |
| -32 | -32 | | | | | 4S32CTE32 | 100.8 | 6S32CTE32 | 100.8 |



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## DK
**24° Metric**
**Male light**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M12 X 1.5 | -4 | 10411-12-04Z | | 1A5DK4 | | | | | |
| M14 X 1.5 | -4 | 10411-14-04Z | | 1A6DK4 | | | | | |
| M16 X 1.5 | -6 | 10411-16-06Z | | 1A8DK6 | | | | | |
| M18 X 1.5 | -6 | 10411-18-06Z | | 1A10DK6 | | | | | |
| M18 X 1.5 | -8 | 10411-18-08Z | | 1A10DK8 | | | | | |
| M22 X 1.5 | -8 | 10411-22-08Z | | 1A12DK8 | | | | | |
| M22 X 1.5 | -10 | | | | | | | | |
| M26 X 1.5 | -10 | 10411-26-10Z | | 1A16DK10 | | | | | |
| M26 X 1.5 | -12 | | | | | | | | |
| M30 X 2.0 | -12 | 10411-30-12Z | | 1A20DK12 | | | | | |
| M30 X 2.0 | -16 | | | | | | | | |
| M36 X 2.0 | -16 | 10411-36-16Z | | 1A25DK16 | | | | | |
| M36 X 2.0 | -20 | | | | | | | | |
| M45 X 2.0 | -20 | 10411-45-20Z | | 1A32DK20 | | | | | |
| M45 X 2.0 | -24 | | | | | | | | |
| M52 X 2.0 | -24 | 10411-52-24Z | | 1A40DK24 | | | | | |
| M52 X 2.0 | -32 | | | | | | | | |



AUS 11.indd 86 11/12/23 2:38 pm

## DK
**24° Metric**
**Male light**

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M12 X 1.5 | -4 | | | 07.003-6-4 | | 07.021-6-4 | | 07.056-6-4 | |
| M14 X 1.5 | -4 | | | | | 07.021-8-4 | | | |
| M16 X 1.5 | -6 | | | 07.003-10-6 | | 07.021-10-6 | | 07.056-10-6 | |
| M18 X 1.5 | -6 | | | | | | | | |
| M18 X 1.5 | -8 | | | 07.003-10-8 | | | | 07.056-12-8 | |
| M22 X 1.5 | -8 | | | | | 07.001-15-8 | | | |
| M22 X 1.5 | -10 | | | 07.003-15-10 | | | | 07.056-15-10 | |
| M26 X 1.5 | -10 | | | | | 07.001-18-10 | | | |
| M26 X 1.5 | -12 | | | 07.003-18-12 | | | | 07.056-18-12 | |
| M30 X 2.0 | -12 | | | | | 07.001-22-12 | | | |
| M30 X 2.0 | -16 | | | 07.003-22-16 | | | | 07.056-22-16 | |
| M36 X 2.0 | -16 | | | | | | | | |
| M36 X 2.0 | -20 | | | 07.003-28-20 | | | | 07.056-28-20 | |
| M45 X 2.0 | -20 | | | | | | | | |
| M45 X 2.0 | -24 | | | 07.003-35-24 | | | | | |
| M52 X 2.0 | -24 | | | | | | | | |
| M52 X 2.0 | -32 | | | | | | | | |



AUS 11.indd 87 11/12/23 2:38 pm

## DL

**DKO-light**
**Fem swivel**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M12 X 1.5 | -4 | 20411-12-04WZ | | 1A5DL4 | | | | | |
| M14 X 1.5 | -4 | 20411-14-04WZ | | 1A6DL4 | | | | | |
| M16 X 1.5 | -4 | 20411-16-04TZ | | 1A8DL4 | | | | | |
| M18 X 1.5 | -4 | 20411-18-04TZ | | 1A10DL4 | | | | | |
| M16 X 1.5 | -6 | 20411-16-06WZ | | 1A8DL6 | | 4S8DL6 | | | |
| M18 X 1.5 | -6 | 20411-18-06TZ | | 1A10DL6 | | 4S10DL6 | | | |
| M22 X 1.5 | -6 | 20411-22-06TZ | | 1A12DL6 | | | | | |
| M18 X 1.5 | -8 | | | | | | | | |
| M22 X 1.5 | -8 | 20411-22-08TZ | | 1A12DL8 | | 4S12DL8 | | | |
| M22 X 1.5 | -10 | | | | | | | | |
| M26 X 1.5 | -8 | | | 1A16DL8 | | | | | |
| M26 X 1.5 | -10 | 20411-26-10TZ | | 1A16DL10 | | 4S16DL10 | | | |
| M26 X 1.5 | -12 | | | | | | | | |
| M30 X 2.0 | -12 | 20411-30-12TZ | | 1A20DL12 | | 4S20DL12 | | | |
| M30 X 2.0 | -16 | 20411-30-16WZ | | | | | | | |
| M36 X 2.0 | -16 | 20411-36-16WZ | | 1A25DL16 | | 4S25DL16 | | | |
| M36 X 2.0 | -20 | | | | | | | | |
| M45 X 2.0 | -20 | 20411-45-20TZ | | 1A32DL20 | | 4S32DL20 | | | |
| M45 X 2.0 | -24 | | | | | | | | |
| M52 X 2.0 | -24 | 20411-52-24TZ | | 1A40DL24 | | | | | |
| M52 X 2.0 | -32 | | | | | | | | |



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## DL
**DKO-light**
**Fem swivel**

| | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M12 X 1.5 | -4 | | | 07.002-4-4 | | GA15705-4 | | 07.046-4-4 | |
| M14 X 1.5 | -4 | | | | | GA15523-4 | | | |
| M16 X 1.5 | -4 | | | | | | | | |
| M18 X 1.5 | -4 | | | | | | | | |
| M16 X 1.5 | -6 | | | 07.002-8-6 | | GA15706-6 | | 07.046-8-6 | |
| M18 X 1.5 | -6 | | | | | GA15523-6 | | | |
| M22 X 1.5 | -6 | | | | | | | | |
| M18 X 1.5 | -8 | | | 07.002-10-8 | | | | 07.046-10-8 | |
| M22 X 1.5 | -8 | | | | | GA15523-8 | | | |
| M22 X 1.5 | -10 | | | 07.002-13-10 | | | | 07.046-13-10 | |
| M26 X 1.5 | -8 | | | | | | | | |
| M26 X 1.5 | -10 | | | | | GA15523-10 | | | |
| M26 X 1.5 | -12 | | | 07.002-16-12 | | | | 07.046-16-12 | |
| M30 X 2.0 | -12 | | | | | GA15523-12 | | | |
| M30 X 2.0 | -16 | | | 07.002-22-16 | | | | 07.046-22-16 | |
| M36 X 2.0 | -16 | | | | | | | | |
| M45 X 2.0 | -20 | | | | | | | | |
| M45 X 2.0 | -20 | | | | | | | | |
| M45 X 2.0 | -24 | | | 07.002-35-24 | | | | | |
| M52 X 2.0 | -24 | | | | | | | | |
| M52 X 2.0 | -32 | | | 07.002-42-32 | | | | | |



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## DLA
**DKO-light**
**45° Swept**
**Fem swivel**

| | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|
| | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M12 X 1.5 | -4 | 20441-12-04WZ | 15.1 | | | | | | |
| M14 X 1.5 | -4 | 20441-14-04WZ | 16.0 | 1A6DLA4 | 17.5 | | | | |
| M16 X 1.5 | -4 | 20441-16-04TZ | 16.0 | 1A8DLA4 | 18.4 | | | | |
| M16 X 1.5 | -6 | 20441-16-06WZ | 17.0 | 1A8DLA6 | 19.0 | | | | |
| M18 X 1.5 | -6 | 20441-18-06TZ | 18.5 | 1A10DLA6 | 20.50 | | | | |
| M18 X 1.5 | -8 | 20441-18-08WZ | 18.7 | | | | | | |
| M22 X 1.5 | -8 | 20441-22-08TZ | 20,0 | 1A12DLA8 | 21.5 | | | | |
| M22 X 1.5 | -10 | | | | | | | | |
| M26 X 1.5 | -10 | 20441-26-10TZ | 23.5 | 1A16DLA10 | 27.5 | | | | |
| M26 X 1.5 | -12 | 20441-26-12WZ | 24.6 | | | | | | |
| M30 X 2.0 | -12 | 20441-30-12TZ | 25.6 | 1A20DLA12 | 26.0 | | | | |
| M30 X 2.0 | -16 | | | | | | | | |
| M36 X 2.0 | -16 | 20441-36-16WZ | 32.0 | 1A25DLA16 | 33.5 | | | | |
| M36 X 2.0 | -20 | | | | | | | | |
| M45 X 2.0 | -20 | 20441-45-20TZ | 38.0 | 1A32DLA20 | 43.0 | | | | |
| M45 X 2.0 | -24 | | | | | | | | |
| M52 X 2.0 | -24 | 20441-52-24TZ | 43.7 | 1A40DLA24 | | | | | |
| M52 X 2.0 | -32 | | | | | | | | |



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## DLA

**DKO-light**

**45 Swept**

| | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M12 X 1.5 | -4 | | | GA15065-4 | 13.2 | | | 07.046-4-4 | |
| M14 X 1.5 | -4 | | | | | GA15069-4 | 14.2 | | |
| M16 X 1.5 | -4 | | | | | | | | |
| M16 X 1.5 | -4 | | | | | | | | |
| M16 X 1.5 | -6 | | | GA15065-6 | 16.7 | GA15069-6 | 20.6 | 07.046-8-6 | |
| M18 X 1.5 | -6 | | | | | | | | |
| M18 X 1.5 | -8 | | | GA15065-8 | 20.8 | | | 07.046-10-8 | |
| M22 X 1.5 | -8 | | | | | GA15069-8 | 22.4 | | |
| M22 X 1.5 | -10 | | | GA15065-10 | 18.0 | | | 07.046-13-10 | |
| M26 X 1.5 | -10 | | | | | GA15069-10 | 24.3 | | |
| M26 X 1.5 | -12 | | | GA15065-12 | 24.6 | | | 07.046-16-12 | |
| M30 X 2.0 | -12 | | | | | GA15069-12 | 26.6 | | |
| M30 X 2.0 | -16 | | | GA15065-16 | 26.6 | | | 07.046-22-16 | |
| M36 X 2.0 | -16 | | | | | | | | |
| M36 X 2.0 | -20 | | | GA15065-20 | 29.9 | | | 07.046-28-20 | |
| M45 X 2.0 | -24 | | | GA15065-24 | 29.0 | | | | |
| M45 X 2.0 | -20 | | | | | | | | |
| M52 X 2.0 | -32 | | | GA15065-32 | 35.0 | | | | |



AUS 11.indd 91 11/12/23 2:38 pm

## DLB
**DKO-light**
**90° Swept**
**Fem swivel**

| | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|
| | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M12 X 1.5 | -4 | 20491-12-04WZ | 30.0 | 1A5DLB4 | 26.5 | | | | |
| M14 X 1.5 | -4 | 20491-14-04WZ | 30.5 | 1A6DLB4 | 31.5 | | | | |
| M16 X 1.5 | -4 | 20491-16-04TZ | 30.5 | 1A8DLB4 | 35.5 | | | | |
| M18 X 1.5 | -4 | 20491-18-04TZ | 30.5 | 1A10DLB4 | | | | | |
| M16 X 1.5 | -6 | 20491-16-06WZ | 33.0 | 1A8DLB6 | 35.5 | | | | |
| M18 X 1.5 | -6 | 20491-18-06TZ | 36.0 | 1A10DLB6 | 39.0 | | | | |
| M18 X 1.5 | -8 | 20491-18-08WZ | 37.0 | | | | | | |
| M22 X 1.5 | -8 | 20491-22-08TZ | 41.5 | 1A12DLB8 | 43.0 | | | | |
| M22 X 1.5 | -10 | 20491-22-10WZ | 44.5 | | | | | | |
| M26 X 1.5 | -10 | 20491-26-10TZ | 51.5 | 1A16DLB10 | 59.0 | | | | |
| M26 X 1.5 | -12 | 20491-26-12WZ | 51.5 | | | | | | |
| M30 X 2.0 | -10 | 20491-30-10TZ | 51.5 | 1A20DLB12 | 54.0 | | | | |
| M30 X 2.0 | -12 | 20491-30-12TZ | 56.0 | | | 4S20DLB12 | 50.7 | | |
| M36 X 2.0 | -16 | 20491-36-16TZ | 56.0 | 1A25DLB16 | 71.0 | | | | |
| M36 X 2.0 | -20 | | | | | | | | |
| M45 X 2.0 | -20 | 20491-45-20TZ | 78.5 | 1A32DLB20 | 76.0 | 4S32DLB20 | 79.0 | | |
| M45 X 2.0 | -24 | 20491-45-24WZ | 91.5 | | | | | | |
| M52 X 2.0 | -24 | 20491-52-24TZ | 100.5 | 1A40DLB24 | | | | | |
| M52 X 2.0 | -32 | | | | | | | | |



AUS 11.indd 92 11/12/23 2:38 pm

## DLB
**DKO-light**

**90 Swept**

| | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M12 X 1.5 | -4 | | | GA15067-4 | | GA15711-4 | | 07.049-4-4 | |
| M14 X 1.5 | -4 | | | | | GA15071-4 | | | |
| M16 X 1.5 | -4 | | | | | | | | |
| M18 X 1.5 | -4 | | | | | | | | |
| M16 X 1.5 | -6 | | | GA15067-6 | | GA15711-6 | | 07.049-8-6 | |
| M18 X 1.5 | -8 | | | GA15067-8 | | | | 07.049-10-8 | |
| M22 X 1.5 | -8 | | | | | GA15071-8 | | | |
| M22 X 1.5 | -10 | | | GA15067-10 | | | | 07.049-13-10 | |
| M26 X 1.5 | -10 | | | | | GA10571-10 | | | |
| M26 X 1.5 | -12 | | | GA15067-12 | | | | 07.049-16-12 | |
| M30 X 2.0 | -10 | | | | | GA10571-12 | | | |
| M30 X 2.0 | -12 | | | GA15067-16 | | | | 07.049-22-16 | |
| M36 X 2.0 | -16 | | | | | | | | |
| M36 X 2.0 | -20 | | | GA15067-20 | | | | 07.049-28-20 | |
| M45 X 2.0 | -20 | | | | | | | | |
| M45 X 2.0 | -20 | | | | | | | | |
| M45 X 2.0 | -24 | | | GA15067-24 | | | | | |
| M52 X 2.0 | -24 | | | | | | | | |
| M52 X 2.0 | -32 | | | GA15067-32 | | | | | |



AUS 11.indd 93 11/12/23 2:38 pm

## DS
**DKO-heavy**
**Fem swivel**

| | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|
| | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M16 X 1.5 | -04 | 20511-16-04TZ | | 1A5DS4 | | | | | |
| M18 X 1.5 | -04 | 20511-18-04TZ | | 1A6DS4 | | | | | |
| M18 X 1.5 | -06 | 20511-18-06TZ | | 1A6DS6 | | | | | |
| M20 X 1.5 | -06 | 20511-20-06TZ | | 1A8DS6 | | 4S8DS6 | | | |
| M22 X 1.5 | -06 | 20511-22-06TZ | | 1A10DS6 | | 4S10DS6 | | | |
| M22 X 1.5 | -08 | 20511-22-08TZ | | 1A10DS8 | | 4S10DS8 | | | |
| M24 X 1.5 | -08 | 20511-24-08TZ | | 1A12DS8 | | 4S12DS8 | | | |
| M24 X 1.5 | -10 | 20511-24-10WZ | | 1A12DS10 | | | | | |
| M30 X 2.0 | -10 | 20511-30-10TZ | | 1A16DS10 | | 4S16DS10 | | | |
| M30 X 2.0 | -12 | 20511-30-12TZ | | 1A16DS12 | | | | | |
| M36 X 2.0 | -12 | 20511-36-12TZ | | 1A20DS12 | | 4S20DS12 | | | |
| M36 X 2.0 | -16 | 20511-36-16WZ | | | | | | | |
| M42 X 2.0 | -16 | 20511-42-16TZ | | 1A25DS16 | | 4S25DS16 | | 6S25DS16 | |
| M42 X 2.0 | -20 | 20511-42-20WZ | | 1A25DS20 | | 4S25DS20 | | | |
| M52 X 2.0 | -16 | | | 1A32DS20 | | 4S32DS16 | | 6S32DS16 | |
| M52 X 2.0 | -20 | 20511-52-20TZ | | 1A32DS20 | | 4S32DS20 | | 6S32DS20 | |



AUS 11.indd 94 11/12/23 2:38 pm

## DS
**DKO-heavy**
**Fem swivel**

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M16 X 1.5 | -04 | | | | | | | 07.161-8-4 | |
| M18 X 1.5 | -04 | | | | | | | | |
| M20 X 1.5 | -06 | | | | | | | 07.161-12-6 | |
| | | | | | | | | | |
| M22 X 1.5 | -06 | | | | | | | | |
| M22 X 1.5 | -08 | | | | | | | 07.161-14-8 | |
| M24 X 1.5 | -08 | | | | | | | | |
| M24 X 1.5 | -10 | | | | | | | 07.161-16-10 | |
| M30 X 2.0 | -10 | | | | | | | | |
| M30 X 2.0 | -12 | | | | | | | 07.161-20-12 | |
| M36 X 2.0 | -12 | | | | | | | | |
| M36 X 2.0 | -16 | | | | | | | 07.161-25-16 | |
| M42 X 2.0 | -16 | | | | | | | | |
| M42 X 2.0 | -20 | | | | | | | 07.161-30-20 | |
| M52 X 2.0 | -20 | | | | | | | | |
| M52 X 2.0 | -20 | | | | | | | | |
| M52 X 2.0 | -24 | | | | | | | | |



AUS 11.indd 95 11/12/23 2:38 pm

## DSA
**45 Swept**
**Fem swivel**

| | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|
| | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M18 X 1.5 | -4 | 20541-18-04TZ | 17.0 | 1A6DSA4 | 17.0 | | | | |
| M20 X 1.5 | -6 | 20541-20-06TZ | 19 | 1A8DSA6 | 19.0 | 4S8DSA6 | 24.0 | | |
| M22 X 1.5 | -6 | 20541-22-06TZ | 18.0 | 1A10DSA6 | 20.0 | | | | |
| M22 X 1.5 | -8 | 20541-22-08TZ | 20.7 | | | | | | |
| M24 X 1.5 | -8 | 20541-24-06TZ | 21.0 | 1A12DSA8 | 23.0 | 4S12DSA8 | 30.0 | | |
| M24 X 1.5 | -10 | | | | | | | | |
| M30 X 2.0 | -10 | 20541-30-10TZ | 25.0 | 1A16DSA10 | 26.0 | 4S16DSA10 | | | |
| M36 X 2.0 | -12 | 20541-36-12TZ | 30.5 | 1A20DSA12 | 32.5 | 4S20DSA12 | 32.0 | | |
| M42 X 2.0 | -12 | | | | | 4S25DSA12 | 35.0 | | |
| M42 X 2.0 | -16 | 20541-42-16TZ | 35.5 | 1A25DSA16 | 37.5 | 4S25DSA16 | 35.0 | 6S25DSA16 | 35.0 |
| M52X2.0 | -16 | | | | | | | 6S32DSA16 | 39.0 |
| M52 X 2.0 | -20 | 20541-52-20TZ | 42.0 | 1A32DSA20 | | 4S32DSA20 | 39.0 | 6S32DSA20 | 39.0 |



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## DSA
**45° Swept**
**Fem swivel**

| | Reusable | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 & 2 wire | | SAE100R5 | | Socketless | | | Teflon | |
| | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | "H" | List | Part No. | "H" |
| M16 x 1.5 | -4 | | | | | | | 07.162-8-4 | |
| M18 X 1.5 | -5 | | | | | | | 07.162-10-5 | |
| M20 X 1.5 | -6 | | | | | | | 07.162-12-6 | |
| M22 X 1.5 | -8 | | | | | | | 07.162-14-8 | |
| M24 X 1.5 | -10 | | | | | | | 07.162-16-10 | |
| M30 X 2 | -12 | | | | | | | 07.162-20-12 | |
| M36 X 2 | -16 | | | | | | | 07.162-25-16 | |
| M42 X 2 | -20 | | | | | | | 07.162-30-20 | |



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## DSB
**DKO-heavy**
**90° Swept**
**Fem swivel**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M16 X 1.5 | -04 | 20591-16-04TZ | 31.0 | 1A5DSB4 | | | | | |
| M18 X 1.5 | -04 | 20591-18-04TZ | 32.0 | 1A6DSB4 | 33.5 | | | | |
| M18 X 1.5 | -06 | 20591-18-06TZ | 35.0 | 1A6DSB6 | | | | | |
| M20 X 1.5 | -06 | 20591-20-06TZ | 35.5 | 1A8DSB6 | 35.0 | 4S8DSB6 | 35.0 | | |
| M22 x 1.5 | -06 | 20591-22-06TZ | 35.5 | 1A10DSB6 | 42.0 | 4S10DSB6 | 42.0 | | |
| M22 X 1.5 | -08 | 20591-22-08TZ | 42.5 | 1A12DSB8 | 49.0 | 4S12DSB8 | 49.0 | | |
| M24 X 1.5 | -08 | 20591-24-08TZ | 43.0 | | | | | | |
| M24 X 1.5 | -10 | | | | | | | | |
| M30 X 2.0 | -10 | 20591-30-10TZ | 49.5 | 1A16DSB10 | 53.5 | 4S16DSB10 | 53.3 | | |
| M30 X 2.0 | -12 | 20591-30-12TZ | 54.5 | | | | | | |
| M36 X 2.0 | -12 | 20591-36-12TZ | 59.0 | 1A20DSB12 | 64.5 | 4S20DSB12 | 65.0 | | |
| M36 X 2.0 | -16 | 20591-36-16WZ | 63.5 | | | | | | |
| M42 X 2.0 | -16 | 20591-42-16TZ | 70.0 | 1A25DSB16 | 74.0 | 4S25DSB16 | 76.0 | 6S25DSB16 | 76.0 |
| M52 X 2.0 | -16 | | | | | 4S32DSB16 | 89.0 | 6S32DSB16 | 89.0 |
| M52 X 2.0 | -20 | 20591-52-20TZ | 86.5 | | | 4S32DSB20 | 89.0 | 6S32DSB20 | 89.0 |
| M52 X 2.0 | -24 | 20591-52-24TZ | 109.4 | | | | | | |



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## DSB
**DKO-heavy**
**90° Swept**
**Fem swivel**

| | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M16 X 1.5 | -04 | | | | | | | 07.163-8-4 | |
| M18 X 1.5 | -04 | | | | | | | | |
| M18 X 1.5 | -06 | | | | | | | | |
| M20 X 1.5 | -06 | | | | | | | 07.163-12-6 | |
| M22 X 1.5 | -08 | | | | | | | 07.163-14-8 | |
| M24 X 1.5 | -08 | | | | | | | | |
| M24 X 1.5 | -10 | | | | | | | 07.163-16-10 | |
| M30 X 2.0 | -10 | | | | | | | | |
| M30 X 2.0 | -12 | | | | | | | 07.163-20-12 | |
| M52 X 2.0 | -20 | | | | | | | | |
| M36 X 2.0 | -12 | | | | | | | | |
| M36 X 2.0 | -16 | | | | | | | 07.163-25-16 | |
| M42 X 2.0 | -16 | | | | | | | | |
| M42 X 2.0 | -20 | | | | | | | 07.163-30-20 | |
| M52 X 2.0 | -20 | | | | | | | | |
| M52 X 2.0 | -24 | | | | | | | | |



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## EK
**DKO-heavy**
**Male**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | List | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M16 X 1.5 | -04 | 10511-16-04Z | | 1A5EK4 | | | | | |
| M18 X 1.5 | -04 | 10511-18-04Z | | 1A6EK4 | | | | | |
| M18 X 1.5 | -06 | 10511-18-06Z | | | | 4S6EK6 | | | |
| M20 X 1.5 | -06 | 10511-20-06Z | | 1A8EK6 | | 4S8EK8 | | | |
| M22 x 1.5 | -06 | 10511-22-06Z | | 1A10EK6 | | 4S10EK8 | | | |
| M22 X 1.5 | -08 | 10511-22-08Z | | 1A12EK8 | | 4S12EK8 | | | |
| M24 X 1.5 | -08 | 10511-24-08Z | | | | | | | |
| M24 X 1.5 | -10 | | | | | | | | |
| M30 X 2.0 | -10 | 10511-30-10Z | | 1A16EK10 | | 4S16EK10 | | | |
| M30 X 2.0 | -12 | 10511-30-12Z | | | | | | | |
| M36 X 2.0 | -12 | 10511-36-12Z | | 1A20EK12 | | 4S20EK12 | | | |
| M36 X 2.0 | -16 | 10511-36-16Z | | | | | | | |
| M42 X 2.0 | -16 | 10511-42-16Z | | 1A25EK16 | | 4S25EK16 | | | |
| M52 X 2.0 | -16 | | | | | | | | |
| M52 X 2.0 | -20 | | | 1A32EK20 | | 4S32EK20 | | | |
| M52 X 2.0 | -24 | | | | | | | | |



AUS 11.indd 100 11/12/23 2:38 pm

## EK
**DKO-heavy**
**Male**

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M16 X 1.5 | -04 | | | 07.026-8-4 | | | | | |
| M18 X 1.5 | -04 | | | | | | | | |
| M18 X 1.5 | -06 | | | | | | | | |
| M20 X 1.5 | -06 | | | 07.026-12.6 | | | | | |
| M22 X 1.5 | -08 | | | 07.026-14-8 | | | | | |
| M24 X 1.5 | -08 | | | | | | | | |
| M24 X 1.5 | -10 | | | 07.026-16-10 | | | | | |
| M30 X 2.0 | -10 | | | | | | | | |
| M30 X 2.0 | -12 | | | 07.026-20-12 | | | | | |
| M52 X 2.0 | -20 | | | | | | | | |
| M36 X 2.0 | -12 | | | | | | | | |
| M36 X 2.0 | -16 | | | 07.025-25-16 | | | | | |
| M42 X 2.0 | -16 | | | | | | | | |
| M42 X 2.0 | -20 | | | 07.026-30-20 | | | | | |
| M52 X 2.0 | -20 | | | | | | | | |
| M52 X 2.0 | -24 | | | 07.026-38-24 | | | | | |



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## FJ
**JIC**
**Fem swivel**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 3/8-24 | -04 | | | 1AA3FJ4 | | | | | |
| 7/16-20 | -04 | 26711-04-04Z | | 1AA4FJ4 | | | | | |
| 1/2-20 | -04 | 26711-05-04Z | | 1AA5FJ4 | | | | | |
| 9/16-18 | -04 | 26711-06-04Z | | 1AA6FJ4 | | | | | |
| 7/16-20 | -06 | 26711-04-06Z | | 1AA4FJ6 | | 4SA4FJ6 | | | |
| 1/2-20 | -06 | 26711-05-06Z | | 1AA5FJ6 | | | | | |
| 9/16-18 | -06 | 26711-06-06Z | | 1AA6FJ6 | | 4SA6FJ6 | | | |
| 3/4-16 | -06 | 26711-08-06Z | | 1AA8FJ6 | | 4SA8FJ6 | | | |
| 3/4-16 | -08 | 26711-08-08Z | | 1AA8FJ8 | | 4SA8FJ8 | | | |
| 7/8-14 | -08 | 26711-10-08Z | | 1AA10FJ8 | | 4SA10FJ8 | | | |
| 1 1/16-12 | -08 | 26711-12-08TZ | | 1AA12FJ8 | | 4SA12FJ8 | | | |
| 1 5/16-12 | -08 | | | 1AA16FJ8 | | | | | |
| 7/8-14 | -10 | 26711-10-10Z | | 1AA10FJ10 | | 4SA10FJ10 | | | |
| 1 1/16-12 | -10 | 26711-12-10Z | | 1AA12FJ10 | | 4SA12FJ10 | | | |
| 7/8-14 | -12 | 26711-10-12Z | | 1AA10FJ12 | | 4SA10FJ12 | | | |
| 1 1/16-12 | -12 | 26711-12-12Z | | 1AA12FJ12 | | 4SA12FJ12 | | | |
| 1 3/16-12 | -12 | 26711-14-12Z | | 1AA14FJ12 | | 4SA14FJ12 | | | |
| 1 5/16-12 | -12 | 26711-16-12TZ | | 1AA16FJ12 | | 4SA16FJ12 | | | |
| 1 1/16-12 | -16 | 26711-12-16Z | | 1AA12FJ16 | | 4SA12FJ16 | | | |
| 1 5/16-12 | -16 | 26711-16-16Z | | 1AA16FJ16 | | 4SA16FJ16 | | 6SA16FJ16 | |
| 1 5/8-12 | -16 | 26711-20-16TZ | | 1AA20FJ16 | | 4SA20FJ16 | | | |
| 1 5/16-12 | -20 | 26711-16-20Z | | 1AA16FJ20 | | 4SA16FJ20 | | | |
| 1 5/8-12 | -20 | 26711-20-20WZ | | 1AA20FJ20 | | 4SA20FJ20 | | 6SA20FJ20 | |
| 1 7/8-12 | -20 | 26711-24-20TZ | | | | 4SA24FJ20 | | 6SA24FJ20 | |
| 1 7/8-12 | -24 | 26711-24-24TZ | | 1AA24FJ24 | | 4SA24FJ24 | | 6SA24FJ24 | |
| 1 7/8-12 | -32 | | | 1AA24FJ32 | | | | | |
| 2 1/2-12 | -32 | 26711-32-32TZ | | 1AA32FJ32 | | 4SA32FJ32 | | 6SA32FJ32 | |



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## FJ
**JIC**
**Fem swivel**

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195 EC215 | | FC350 FC300 FC234 | | FC332 FC598 2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 3/8-24 | -04 | | | | | 4741-3-4B | | | |
| 7/16-20 | -04 | DSR05-0704 | | 4411-4S* | | 4797-4B | | 63-190600-4* | |
| 1/2-20 | -04 | DSR05-0804 | | | | | | | |
| 9/16-18 | -04 | DSR05-0904 | | 4411-6-4S | | 4797-6-4B | | | |
| 7/16-20 | -06 | | | | | | | | |
| 1/2-20 | -06 | | | | | 4741-5-6B | | | |
| 9/16-18 | -06 | DSR05-0906 | | 4411-6S* | | 4741-6B | | 63-190600-6* | |
| 3/4-16 | -06 | DSR05-1206 | | | | | | | |
| 3/4-16 | -08 | DSR05-1208 | | 4411-8S* | | 4797-8B | | 63-190600-8* | |
| 7/8-14 | -08 | DSR05-1408 | | 4411-10-8S | | | | | |
| 1 1/16-12 | -08 | | | | | | | | |
| 1 5/16-12 | -08 | | | | | | | | |
| 7/8-14 | -10 | DSR05-1410 | | 4411-10S* | | 4797-10B | | 63-190600-10* | |
| 1 1/16-12 | -10 | DSR05-1710 | | 4411-12-10S | | | | | |
| 7/8-14 | -12 | | | | | | | | |
| 1 1/16-12 | -12 | DSR05-1712 | | 4411-12S* | | 4741-12B | | 63-190600-12* | |
| 1 3/16-12 | -12 | | | | | | | | |
| 1 5/16-12 | -12 | DSR05-2112 | | 4411-16-12S | | | | | |
| 1 1/16-12 | -16 | | | | | | | | |
| 1 5/16-12 | -16 | DSR05-2116 | | 4411-16S | | | | 63-190600-16* | |
| 1 5/8-12 | -16 | | | | | | | | |
| 1 5/16-12 | -20 | | | | | | | | |
| 1 5/8-12 | -20 | | | 4411-20S | | | | 63-190600-20 | |
| 1 7/8-12 | -20 | | | | | | | | |
| 1 7/8-12 | -24 | | | 4411-24S | | | | | |
| 1 7/8-12 | -32 | | | | | | | | |
| 2 1/2-12 | -32 | | | 4411-32S | | | | | |

*= Available in Brass Order 411-*B

* = Available in stainless steel delete '-63' add 'C'



AUS 11.indd 103 11/12/23 2:38 pm

## FJA
**JIC/SAE**
**45° Swept**
**Fem swivel**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 7/16-20 | -04 | 27641-04-04Z | 13.0 | 1AA4FJA4 | 8.4 | | | | |
| 1/2-20 | -04 | 27641-05-04Z | 13.5 | 1AA5FJA4 | 9.4 | | | | |
| 9/16-18 | -04 | 27641-06-04Z | 13.5 | 1AA6FJA4 | 9.9 | | | | |
| 9/16-18 | -06 | 27641-06-06Z | 14.8 | 1AA6FJA6 | 9.9 | 4SA6FJA6 | 21.6 | | |
| 3/4-16 | -06 | 27641-08-06Z | 16.2 | 1AA8FJA6 | 14.0 | 4SA8FJA6 | 24.1 | | |
| 3/4-16 | -08 | 27641-08-08Z | 19.0 | 1AA8FJA8 | 14.0 | 4SA8FJA8 | 24.1 | | |
| 7/8-14 | -08 | 27641-10-08Z | 20.4 | 1AA10FJA8 | 15.0 | 4SA10FJA8 | 25.4 | | |
| 3/4-16 | -10 | 27641-08-10Z | 21.4 | | | | | | |
| 7/8-14 | -10 | 27641-10-10Z | 22.1 | 1AA10FJA10 | 15.0 | 4SA10FJA10 | 29.5 | | |
| 1 1/16-12 | -10 | 27641-12-10Z | 22.8 | 1AA12FJA10 | 19.8 | | | | |
| 7/8-14 | -12 | 27641-10-12Z | 22.1 | | | | | | |
| 1 1/16-12 | -12 | 27641-12-12Z | 24.2 | 1AA12FJA12 | 19.8 | 4SA12FJA12 | 29.0 | | |
| 1 5/16-12 | -12 | 27641-16-12Z | 25.0 | | | | | | |
| 1 5/8-12 | -16 | 27641-20-16WZ | 31.1 | 1AA20FJA16 | 31.0 | | 32.0 | | |
| 1 5/16-12 | -16 | 27641-16-16Z | 28.7 | 1AA16FJA16 | 27.2 | 4SA16FJA16 | 38.0 | | |
| 1 5/8-12 | -20 | 27641-20-20WZ | 35.5 | 1AA20FJA20 | 31.00 | 4SA20FJA20 | 32.0 | 6SA20FJA20 | 32.0 |
| 1 7/8-12 | -24 | 27641-24-24WZ | 44.1 | 1AA24FJA24 | 51.00 | 4SA24FJA24 | 43.0 | 6SA24FJA24 | 43.0 |
| 2 1/2-12 | -32 | 27641-32-32WZ | 51.6 | | | | | | |



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## FJA
**JIC/SAE**
**45° Swept**
**Fem swivel**

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195 EC215 | | FC350 FC300 FC234 | | FC332 FC598 2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 7/16-20 | -04 | DSR99-0704 | 13.0 | 190297-4S | 8.4 | FC5849-0404S | 8.4 | 190773-4S | 8.4 |
| 1/2-20 | -04 | | | | | | | | |
| 9/16-18 | -04 | | | | | | | | |
| 9/16-18 | -06 | DSR99-0906 | 14.8 | 190265-6S | 9.9 | FC5847-0606S | 9.9 | 190773-6S | 9.9 |
| 3/4-16 | -06 | DSR99-1206 | 16.2 | 190297-8-6S | 14.0 | | | | |
| 3/4-16 | -08 | DSR99-1208 | 19.0 | 190297-8S | 14.0 | FC5849-0808S | 14.0 | 190773-8S | 14.0 |
| 7/8-14 | -08 | DSR99-1408 | 20.4 | | | | | | |
| 3/4-16 | -10 | | | 190297-8-10S | 16.3 | | | | |
| 7/8-14 | -10 | DSR99-1410 | 22.1 | 190297-10S | 16.3 | | | 190773-10S | 16.3 |
| 1 1/16-12 | -10 | | | | | | | | |
| 7/8-14 | -12 | | | 190297-10-12S | 16.3 | | | | |
| 1 1/16-12 | -12 | DSR99-1712 | 24.2 | 190265-12S | 19.8 | | | 190773-12S | 19.8 |
| 1 5/16-12 | -12 | | | 190265-16-12S | 19.8 | | | | |
| 1 5/8-12 | -16 | | | | | | | | |
| 1 5/16-12 | -16 | DSR99-2116 | 28.70 | 190265-16S | 27.2 | | | 190773-16S | 27.2 |
| 1 5/8-12 | -20 | | | 190265-20S | 31.0 | | | 190773-20S | 31.0 |
| 1 7/8-12 | -24 | | | | | | | | |



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## FJB
**JIC/SAE**
**90° Swept**
**Fem swivel**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 7/16-20 | -04 | 26791-04-04Z | 26.3 | 1AA4FJB4 | 17.3 | | | | |
| 1/2-20 | -04 | 26791-05-04Z | 27.0 | 1AA5FJB4 | 19.3 | | | | |
| 9/16-18 | -04 | 26791-06-04Z | 27.0 | 1AA6FJB4 | 21.3 | | | | |
| 9/16-18 | -06 | 26791-06-06Z | 31.5 | 1AA6FJB6 | 21.3 | 4SA6FJB6 | 38.1 | | |
| 3/4-16 | -06 | 26791-08-06Z | 33.5 | 1AA8FJB6 | 27.7 | 4SA8FJB6 | 47.5 | | |
| 9/16-18 | -08 | 26791-06-08Z | 31.5 | 1AA6FJB8 | 27.8 | | | | |
| 3/4-16 | -08 | 26791-08-08Z | 40.0 | 1AA8FJB8 | 27.8 | 4SA8FJB8 | 47.5 | | |
| 7/8-14 | -08 | 26791-10-08Z | 42.0 | 1AA10FJB8 | 30.2 | 4SA10FJB8 | 49.0 | | |
| 7/8-14 | -10 | 26791-10-10Z | 47.5 | 1AA10FJB10 | 30.2 | 4SA10FJB10 | 30.2 | | |
| 1 1/16-12 | -10 | 26791-12-10Z | 49.0 | 1AA12FJB10 | 45.7 | 4SA12FJB10 | 69.7 | | |
| 7/8-14 | -12 | 26791-10-12Z | 47.5 | | | | | | |
| 3/4-16 | -12 | 26791-08-12Z | 40.0 | | | | | | |
| 1 1/16-12 | -12 | 26791-12-12Z | 53.5 | 1AA12FJB12 | 45.7 | 4SA12FJB12 | 58.0 | | |
| 1 5/16-12 | -12 | 26791-16-12Z | 53.6 | 1AA16FJB12 | 60.7 | 4SA16FJB12 | 71.0 | | |
| 1 1/16-14 | -16 | 26791-12-16Z | 53.5 | | | | | | |
| 1 5/16-12 | -16 | 26791-16-16Z | 66.1 | 1AA16FJB16 | 60.7 | 4SA16FJB16 | 71.0 | 6SA16FJB16 | 71.0 |
| 1 5/8-12 | -16 | 26791-20-16WZ | 69.5 | | | 4SA20FJB16 | 78.0 | | |
| 1 5/8-12 | -20 | 26791-20-20WZ | 80.0 | 1AA20FJB20 | 69.9 | 4SA20FJB20 | 78.0 | 6SA20FJB20 | 78.0 |
| 1 7/8-12 | -24 | 26791-24-24WZ | 94.0 | 1AA24FJB24 | 80.5 | 4SA24FJB24 | 104.0 | 6SA24FJB24 | 104.0 |
| 2 1/2-12 | -32 | 27691-32-32WZ | 121.8 | | | | | | |



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## FJB
**JIC/SAE**
**90° Swept**
**Fem swivel**

| | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 7/16-20 | -04 | DSR97-0704 | 33.5 | 190296-4S | 17.3 | FC5852-0404S | 45.7 | 190772-4S | 17.3 |
| 1/2-20 | -04 | | | | | | | | |
| 1/2-20 | -5 | | | | | | | 190772-5S | 19.6 |
| 9/16-18 | -06 | DSR97-0906 | 39.30 | 190261-6S | 21.6 | 190516-6S | 21.6 | 190772-6S | 21.6 |
| 3/4-16 | -06 | DSR97-1206 | 39.3 | | | | | | |
| 3/4-16 | -08 | DSR97-1208 | 47.5 | 190296-8S | 27.7 | | | 190772-8S | 27.7 |
| 7/8-14 | -08 | DSR97-1408 | 47.5 | | | | | | |
| 7/8-14 | -10 | DSR97-1410 | 52.5 | 190296-10S | 31.2 | | | 190772-10S | 31.2 |
| 7/8-14 | -12 | | | | | | | | |
| 1 1/16-12 | -12 | DSR97-1712 | 63.5 | 190261-12S | 46.2 | | | 190772-12S | 46.2 |
| 1 5/16-12 | -16 | DSR97-2116 | 70.0 | 190261-16S | 58.4 | | | 190772-16S | 60.7 |
| 1 5/8-12 | -20 | | | 190261-20S | 69.9 | | | | |
| 1 5/8-12 | -20 | | | | | | | | |



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## FJC
**JIC/SAE**
**90° Long drop swept**
**Fem swivel**

| | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|
| | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 7/16-20 | -04 | | | 1AA4FJC4 | 45.7 | | | | |
| 1/2-20 | -04 | | | 1AA5FJC4 | 45.7 | | | | |
| 5/16-18 | -06 | | | | | | | | |
| 9/16-18 | -06 | | | 1AA6FJC6 | 55.4 | 4SA6FJC6 | 69.3 | | |
| 3/4-16 | -06 | | | 1AA8FJC6 | 62.2 | | | | |
| 3/4-16 | -08 | | | 1AA8FJC8 | 62.2 | 4SA8FJC8 | | | |
| 7/8-14 | -08 | | | 1AA10FJC8 | 65.3 | 4SA10FJC8 | 65.3 | | |
| 7/8-14 | -10 | | | 1AA10FJC10 | 65.3 | | | | |
| 7/8-14 | -12 | | | | | | | | |
| 1 1/16-12 | -12 | | | 1AA12FJC12 | 94.0 | 4SA12FJC12 | 96.0 | | |
| 1 5/16-12 | -16 | | | 1AA16FJC16 | 116.3 | 4SA16FJC16 | 114.0 | | |
| 1 5/8-12 | -20 | | | 1AA20FJC20 | 140.5 | 4SA20FJC20 | 129.00 | | |



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## FJC
**JIC/SAE**
**90° Long drop swept**
**Fem swivel**

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 7/16-20 | -04 | DSR98-0704 | 45.7 | 190295-4S | 45.7 | FC5852-0404S | 45.7 | | |
| 1/2-20 | -04 | | 45.7 | | | | | | |
| 5/16-18 | -06 | | | | | | | | |
| 9/16-18 | -06 | DSR98-0906 | 55.4 | 190260-6S | 55.4 | 190465-6S | 55.4 | | |
| 3/4-16 | -06 | DSR98-1206 | 62.2 | | | | | | |
| 3/4-16 | -08 | DSR98-1208 | 62.2 | 190295-8S | 61.7 | | | | |
| 7/8-14 | -08 | | 65.3 | | | | | | |
| 7/8-14 | -10 | DSR98-1410 | 65.3 | 190295-10S | 65.30 | | | | |
| 7/8-14 | -12 | | | 190295-10-12S | 65.3 | | | | |
| 1 1/16-12 | -12 | DSR98-1712 | 94.0 | 190260-12S | 94.7 | | | | |
| 1 5/16-12 | -16 | DSR98-2116 | 116.3 | 190260-16S | 116.3 | | | | |
| 1 5/8-12 | -20 | | | 190260-20S | 140.5 | | | | |



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## FH
**Code 62 flange**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -8 | -8 | | | | | 4S8FH8 | | | |
| -12 | -8 | | | | | 4S12FH8 | | | |
| -12 | -10 | | | | | 4S12FH10 | | | |
| -12 | -12 | | | | | 4S12FH12 | | | |
| -16 | -12 | | | | | 4S16FH12 | | | |
| -12 | -16 | | | | | 4S12FH16 | | | |
| -16 | -16 | | | | | 4S16FH16 | | 6S16FH16 | |
| -20 | -16 | | | | | 4S20FH16 | | 6S20FH16 | |
| -20 | -20 | | | | | 4S20FH20 | | 6S20FH20 | |
| -24 | -20 | | | | | 4S24FH20 | | 6S24FH20 | |
| -24 | -24 | | | | | 4S24FH24 | | 6S24FH24 | |
| -32 | -24 | | | | | 4S32FH24 | | 6S32FH24 | |
| -32 | -32 | | | | | 4S32FH32 | | 6S32FH32 | |



AUS 11.indd 110 11/12/23 2:38 pm

## FHA
**Code 62 flange**
**45 degree**

| | Winner Braided Hose | Braided Hose | Four Spiral Hose | Six Spiral Hose |
|---|---|---|---|---|
| | Two Piece Fittings | TTC | 4S | 6S |
| | EC215<br>USE 03310-SIZE SOCKETS | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 |
| | | | | |

| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
|---|---|---|---|---|---|---|---|---|---|
| -8 | -8 | | | | | | | | |
| -12 | -8 | | | | | | | | |
| -12 | -12 | | | | | 4S12FHA12 | 27.0 | | |
| -16 | -12 | | | | | 4S16FHA12 | 32.0 | | |
| -16 | -16 | | | | | 4S16FHA16 | 32.0 | 6S16FHA16 | 32.0 |
| -20 | -16 | | | | | 4S20FHA16 | 39.0 | 6S20FHA16 | 39.0 |
| -20 | -20 | | | | | 4S20FHA20 | 39.0 | 6S20FHA20 | 39.0 |
| -24 | -20 | | | | | 4S24FHA20 | 45.0 | 6S24FHA20 | 45.0 |
| -24 | -24 | | | | | 4S24FHA24 | 45.0 | 6S24FHA24 | 45.0 |
| -32 | -24 | | | | | 4S32FHA24 | 57.5 | 6S32FHA24 | 57.5 |
| -32 | -32 | | | | | 4S32FHA32 | 57.5 | 6S32FHA32 | 57.5 |



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## FHB
**Code 62 flange**
**90 degree**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -8 | -8 | | | | | 4S8FHB8 | | | |
| -12 | -8 | | | | | | | | |
| -12 | -12 | | | | | 4S12FHB12 | 59.0 | | |
| -16 | -12 | | | | | 4S16FHB12 | 71.0 | | |
| -16 | -16 | | | | | 4S16FHB16 | 71.0 | 6S16FHB16 | 71.0 |
| -20 | -16 | | | | | 4S20FHB16 | 89.0 | 6S20FHB16 | 89.0 |
| -20 | -20 | | | | | 4S20FHB20 | 89.0 | 6S20FHB20 | 89.0 |
| -24 | -20 | | | | | 4S24FHB20 | 104.0 | 6S24FHB20 | 104.0 |
| -24 | -24 | | | | | 4S24FHB24 | 104.0 | 6S24FHB24 | 104.0 |
| -32 | -24 | | | | | 4S32FHB24 | 138.0 | 6S32FHB24 | 138.0 |
| -32 | -32 | | | | | 4S32FHB32 | 138.0 | 6S32FHB32 | 138.0 |



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## FHD
**Code 62 flange**
**22.5 degree**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -16 | -16 | | | | | 4S16FHD16 | 13.5 | | |
| -20 | -16 | | | | | 4S20FHD16 | 16.3 | | |
| -32 | -32 | | | | | 4S32FHD32 | 23.5 | | |



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## FHG
**Code 62 flange**
**60 degree**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -12 | -12 | | | | | 4S12FHG12 | 37.6 | | |
| -16 | -16 | | | | | 4S16FHG16 | 44.6 | 6S16FHG16 | 44.6 |
| -20 | -20 | | | | | | | 6S20FHG20 | 55.8 |
| -32 | -32 | | | | | 4S32FHG32 | 85.8 | | |



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## FHF
**Code 62 flange**
**30 degree**

| | Winner Braided Hose | Braided Hose | Four Spiral Hose | Six Spiral Hose |
|---|---|---|---|---|
| | Two Piece Fittings | TTC | 4S | 6S |
| | EC215<br>USE 03310-SIZE SOCKETS | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 |
| | | | | |

| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
|---|---|---|---|---|---|---|---|---|---|
| -12 | -12 | | | | | | | | |
| -16 | -12 | | | | | | | | |
| -16 | -16 | | | | | | | | |
| -20 | -16 | | | | | | | | |
| -20 | -20 | | | | | | | | |
| -24 | -20 | | | | | 4S24FHF20 | 26.8 | | |
| -24 | -24 | | | | | | | | |
| -32 | -24 | | | | | | | | |
| -32 | -32 | | | | | 4S32FHF32 | 33.9 | | |



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## FL
**Code 61 flange**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -8 | -08 | 87311-08-08Z | | 1A8FL8 | | 4S8FL8 | | | |
| -12 | -08 | 87311-12-08Z | | 1A12FL8 | | 4S12FL8 | | | |
| -12 | -10 | 87311-12-10Z | | 1A12FL10 | | 4S12FL10 | | | |
| -12 | -12 | 87311-12-12Z | | 1A12FL12 | | 4S12FL12 | | | |
| -16 | -12 | 87311-16-12Z | | 1A16FL12 | | 4S16FL12 | | | |
| -16 | -16 | 87311-16-16Z | | 1A16FL16 | | 4S16FL16 | | 6S16FL16 | |
| -16 | -20 | | | 1A16FL20 | | 4S16FL20 | | | |
| -20 | -12 | | | | | 4S20FL12 | | | |
| -20 | -16 | 87311-20-16Z | | 1A20FL16 | | 4S20FL16 | | | |
| -20 | -20 | 87311-20-20Z | | 1A20FL20 | | 4S20FL20 | | 6S20FL20 | |
| -24 | -16 | | | | | 4S24FL16 | | | |
| -24 | -20 | 87311-24-20Z | | 1A24FL20 | | 4S24FL20 | | | |
| -32 | -20 | 87311-32-20Z | | 1A32FL20 | | 4S32FL20 | | | |
| -20 | -24 | 87311-20-24Z | | | | | | | |
| -24 | -24 | 87311-24-24Z | | 1A24FL24 | | 4S24FL24 | | 6S24FL24 | |
| -32 | -24 | 87311-32-24Z | | 1A32FL24 | | 4S32FL24 | | 6S32FL24 | |
| -24 | -32 | | | | | | | | |
| -32 | -32 | 87311-32-32Z | | 1A32FL32 | | 4S32FL32 | | 6S32FL32 | |
| -40 | -32 | | | 1A40FL32 | | | | | |



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## FL
**Code 61 flange**

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -8 | -08 | DSR12-0808 | | 4775-8S | | | | | |
| -12 | -08 | DSR12-1208 | | | | | | | |
| -12 | -10 | | | | | | | | |
| -12 | -12 | DSR12-1212 | | 4775-12S | | | | | |
| -16 | -12 | DSR12-1612 | | 4775-16-12S | | | | | |
| -16 | -16 | DSR12-1616 | | 4775-16S | | | | | |
| -16 | -20 | | | | | | | | |
| -20 | -12 | | | | | | | | |
| -20 | -16 | | | 4775-20-16S | | | | | |
| -20 | -20 | | | 4775-20S | | | | | |
| -24 | -16 | | | | | | | | |
| -24 | -20 | | | | | | | | |
| -32 | -20 | | | | | | | | |
| -20 | -24 | | | 4775-20-24S | | | | | |
| -24 | -24 | | | 4775-24S | | | | | |
| -32 | -24 | | | 4775-32-24S | | | | | |
| -24 | -32 | | | 4775-24-32S | | | | | |
| -32 | -32 | | | 4775-32S | | | | | |
| -40 | -32 | | | 4775-40-32S | | | | | |



AUS 11.indd 117 11/12/23 2:38 pm

## FLA
**Code 61 flange**
**45 degree**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -8 | -08 | 87341-08-08Z | 23.3 | 1A8FLA8 | 19.8 | 4S8FLA8 | 19.8 | | |
| -12 | -08 | 87341-12-08Z | 24.0 | 1A12FLA8 | 25.4 | 4S12FLA8 | 25.4 | | |
| -12 | -10 | | | 1A12FLA10 | 25.4 | 4S12FLA10 | 25.4 | | |
| -12 | -12 | 87341-12-12Z | 28.9 | 1A12FLA12 | 24.7 | 4S12FLA12 | 27.0 | | |
| -16 | -12 | 87341-16-12Z | 28.9 | 1A16FLA12 | 26.9 | 4S16FLA12 | 32.0 | | |
| -20 | -12 | | | 1A20FLA12 | 26.9 | | | | |
| -12 | -16 | 87341-12-16Z | 29.7 | | | 4S12FLA16 | 27.0 | | |
| -16 | -16 | 87341-16-16Z | 29.7 | 1A16FLA16 | 26.9 | 4S16FLA16 | 32.0 | 6S16FLA16 | 32.0 |
| -16 | -20 | | | | | | | | |
| -20 | -16 | 87341-20-16Z | 29.7 | 1A20FLA16 | 29.2 | 4S20FLA16 | 32.0 | 6S20FLA16 | 32.0 |
| -24 | -16 | | | | | | | | |
| -16 | -20 | 87341-16-20Z | 33.8 | 1A16FLA20 | 26.9 | | | | |
| -20 | -20 | 87341-20-20Z | 33.8 | 1A20FLA20 | 30.0 | 4S20FLA20 | 39.0 | 6S20FLA20 | 39.0 |
| -24 | -20 | 87341-24-20Z | 35.2 | 1A24FLA20 | 35.8 | 4S24FLA20 | 39.5 | | 39.5 |
| -32 | -20 | | | | | | | | |
| -24 | -24 | 87341-24-24Z | 39.1 | 1A24FLA24 | 35.8 | 4S24FLA24 | 45.0 | 6S24FLA24 | 45.0 |
| -32 | -24 | 87341-32-24Z | 39.1 | | | | | 6S32FLA24 | 57.50 |
| -32 | -32 | 87341-32-32Z | 46.3 | 1A32FLA32 | 50.8 | 4S32FLA32 | 57.5 | 6S32FLA32 | 57.5 |
| -40 | -32 | | | 1A40FLA32 | 33.0 | | | | |



AUS 11.indd 118 11/12/23 2:38 pm

## FLA
**Code 61 flange**
**45 degree**

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -8 | -08 | DSR14-0808 | 20.0 | 4777-8S | | | | | |
| -12 | -08 | DSR14-1208 | 20.0 | | | | | | |
| -12 | -10 | | | | | | | | |
| -12 | -12 | DSR14-1212 | 25.0 | 4777-12S | 25.4 | | | | |
| -16 | -12 | DSR14-1612 | 25.0 | 4777-16-12S | 25.4 | | | | |
| -20 | -12 | | | | | | | | |
| -12 | -16 | | | | | | | | |
| -16 | -16 | DSR14-1616 | 27.0 | 4777-16S | 28.4 | | | | |
| -16 | -20 | | | 4777-16-20S | 28.4 | | | | |
| -20 | -16 | DSR14-2016 | 27.0 | | | | | | |
| -24 | -16 | | | | | | | | |
| -16 | -20 | | | | | | | | |
| -20 | -20 | | | 4777-20S | 28.4 | | | | |
| -24 | -20 | | | | | | | | |
| -32 | -20 | | | | | | | | |
| -24 | -24 | | | 4777-24S | 28.4 | | | | |
| -32 | -24 | | | 4777-32-24S | 28.4 | | | | |
| -32 | -32 | | | 4777-32S | 31.8 | | | | |
| -40 | -32 | | | 4777-40-32S | 33.0 | | | | |



AUS 11.indd 119 11/12/23 2:38 pm

## FLB
**Code 61 flange**
**90 degree**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -8 | -08 | 87391-08-08Z | 47.0 | 1A8FLB8 | 41.4 | 4S8FLB8 | 54.1 | | |
| -12 | -08 | 87391-12-08Z | 48.0 | 1A12FLB8 | 54.1 | 4S12FLB8 | 54.1 | | |
| -12 | -10 | 87391-12-10Z | 52.5 | 1A12FLB10 | 54.1 | 4S12FLB10 | 54.1 | | |
| -12 | -12 | 87391-12-12Z | 62.0 | 1A12FLB12 | 54.1 | 4S12FLB12 | 59.0 | | |
| -16 | -12 | 87391-16-12Z | 62.0 | 1A16FLB12 | 60.5 | 4S16FLB12 | 71.0 | | |
| -20 | -12 | 87391-20-12Z | 62.0 | 1A20FLB12 | 66.5 | 4S20FLB12 | 65.0 | | |
| -12 | -16 | 87391-12-16Z | 67.5 | 1A12FLB16 | 55.1 | | | | |
| -16 | -16 | 87391-16-16Z | 67.5 | 1A16FLB16 | 60.5 | 4S16FLB16 | 71.0 | 6S16FLB16 | 71.0 |
| -20 | -16 | 87391-20-16Z | 67.5 | 1A20FLB16 | 66.5 | 4S20FLB16 | 89.0 | 6S20FLB16 | 89.0 |
| -24 | -16 | 87391-24-16Z | 69.5 | 1A24FLB16 | 66.5 | 4S24FLB16 | 81.9 | | |
| -16 | -20 | 87391-16-20Z | 78.5 | 1A16FLB20 | 60.5 | 4S16FLB20 | 71.0 | | |
| -20 | -20 | 87391-20-20Z | 78.5 | 1A20FLB20 | 66.5 | 4S20FLB20 | 89.0 | 6S20FLB20 | 89.0 |
| -24 | -20 | 87391-24-20Z | 80.5 | 1A24FLB20 | 79.2 | 4S24FLB20 | 89.4 | | |
| -32 | -20 | 87391-32-24Z | 94.0 | 1A32FLB20 | | 4S32FLB20 | | | |
| -24 | -24 | 87391-24-24Z | 80.5 | 1A24FLB24 | 79.2 | 4S24FLB24 | 104.0 | 6S24FLB24 | 104.0 |
| -32 | -24 | 87391-32-24Z | 94.0 | 1A32FLB24 | 114.3 | 4S32FLB24 | 138.0 | 6S32FLB24 | 138.0 |
| -32 | -32 | 87391-32-32Z | 114.3 | 1A32FLB32 | 114.3 | 4S32FLB32 | 138.0 | 6S32FLB32 | 138.0 |
| -40 | -32 | | | 1A40FLB32 | 115.8 | | | | |



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## FLB
**Code 61 flange**
**90 degree**

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -8 | -08 | DSR13-0808 | 43.0 | 4779-8S | 41.1 | | | | |
| -12 | -08 | DSR13-1208 | 43.0 | | | | | | |
| -12 | -10 | | | | | | | | |
| -12 | -12 | DSR13-1212 | 54.0 | 4779-12S | 53.8 | | | | |
| -16 | -12 | DSR13-1612 | 54.0 | 4779-16-12S | 53.8 | | | | |
| -20 | -12 | | | | | | | | |
| -12 | -16 | | | | | | | | |
| -16 | -16 | DSR13-1616 | 60.5 | 4779-16S | 60.5 | | | | |
| -20 | -16 | | | 4779-16-12 | 53.8 | | | | |
| -24 | -16 | | | | | | | | |
| -16 | -20 | | | 4779-16-20S | 60.5 | | | | |
| -20 | -20 | | | 4779-20S | 63.5 | | | | |
| -24 | -20 | | | 4779-24-20S | 63.5 | | | | |
| -32 | -20 | | | 4779-32-20S | 65.0 | | | | |
| -24 | -24 | | | 4779-24S | 69.9 | | | | |
| -32 | -24 | | | | | | | | |
| -32 | -32 | | | 4779-32S | 82.6 | | | | |
| -40 | -32 | | | 4779-40-32S | 84.1 | | | | |



AUS 11.indd 121 11/12/23 2:38 pm

## FLD
**Code 61 flange**
**22 1/2 degree**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -8 | -8 | | | | | 4S8FLD8 | 9.1 | | |
| -12 | -8 | | | | | 4S12FLD8 | 11.2 | | |
| -12 | -12 | | | | | 4S12FLD12 | 11.6 | | |
| -16 | -12 | | | | | 4S16FLD12 | 13.5 | | |
| -16 | -16 | | | 1A16FLD16 | 11.4 | 4S16FLD16 | 13.5 | | |
| -20 | -16 | | | 1A20FLD16 | 11.7 | 4S20FLD16 | 16.3 | | |
| -20 | -20 | | | 1A20FLD20 | 11.7 | 4S20FLD20 | 16.3 | | |
| -24 | -20 | | | | | 4S24FLD20 | 17.1 | | |
| -24 | -24 | | | | | 4S24FLD24 | 18.8 | | |
| -32 | -24 | | | | | 4S32FLD24 | 23.5 | | |
| -32 | -32 | | | | | 4S32FLD32 | 23.5 | | |



AUS 11.indd 122 11/12/23 2:38 pm

## FLF
**Code 61 flange**
**30 degree**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -8 | -8 | | | | | 4S8FLF8 | 12.7 | | |
| -12 | -8 | | | | | | | | |
| -12 | -12 | | | | | 4S12FLF12 | 16.4 | | |
| -16 | -12 | | | | | 4S16FLF12 | 19.3 | | |
| -16 | -16 | | | | | 4S16FLF16 | 19.3 | | |
| -20 | -16 | | | | | 4S20FLF16 | 23.3 | | |
| -20 | -20 | | | | | 4S20FLF20 | 23.3 | | |
| -24 | -20 | | | | | 4S24FLF20 | 24.1 | | |
| -24 | -24 | | | | | 4S24FLF24 | 26.8 | | |
| -32 | -32 | | | | | 4S32FLF32 | 33.9 | | |



AUS 11.indd 123 11/12/23 2:38 pm

## FLG
**Code 61 flange**
**60 degree**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -8 | -8 | | | | | 4S8FLG8 | 28.7 | | |
| -12 | -8 | | | | | | | | |
| -12 | -12 | | | | | 4S12FLG12 | 37.6 | | |
| -16 | -12 | | | | | 4S16FLG12 | 44.7 | | |
| -16 | -16 | | | 1A16FLG16 | 38.4 | 4S16FLG16 | 44.7 | | |
| -20 | -16 | | | | | 4S20FLG16 | 55.8 | | |
| -20 | -20 | | | | | 4S20FLG20 | 55.8 | | |
| -24 | -20 | | | | | 4S24FLG20 | 51.7 | | |
| -24 | -24 | | | 1A24FLG24 | 46.0 | 4S24FLG24 | 65.2 | | |
| -32 | -24 | | | | | | | | |
| -32 | -32 | | | | | 4S32FLG32 | 85.8 | | |



AUS 11.indd 124 11/12/23 2:38 pm

## FLE
**Code 61 flange**
**67 1/2 degree**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -8 | -8 | | | | | 4S8FLE8 | 32.3 | | |
| -12 | -8 | | | | | | | | |
| -16 | -8 | | | | | | | | |
| -12 | -12 | | | | | 4S12FLE12 | 43.2 | | |
| -16 | -12 | | | | | 4S16FLE12 | 51.5 | | |
| -16 | -16 | | | | | 4S16FLE16 | 51.5 | | |
| -20 | -16 | | | | | 4S20FLE16 | 64.4 | | |
| -20 | -20 | | | | | 4S20FLE20 | 64.4 | | |
| -24 | -20 | | | | | 4S24FLE20 | 59.5 | | |
| -24 | -24 | | | | | 4S24FLE24 | 75.2 | | |
| -32 | -24 | | | | | 4S32FLE24 | 99.3 | | |
| -32 | -32 | | | | | 4S32FLE32 | 99.3 | | |



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## FR
**ORS Female**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 9/16-18 | -04 | 24211-04-04Z | | 1AA4FR4 | | | | | |
| 11/16-16 | -04 | 24211-06-04TZ | | 1AA6FR4 | | | | | |
| 9/16-18 | -06 | 24211-04-06Z | | 1AA4FR6 | | | | | |
| 11/16-16 | -06 | 24211-06-06Z | | 1AA6FR6 | | 4SA6FR6 | | | |
| 13/16-16 | -06 | 24211-08-06TZ | | 1AA8FR6 | | 4SA8FR6 | | | |
| 11/16-16 | -08 | | | 1AA6FR8 | | 4SA6FR8 | | | |
| 13/16-16 | -08 | 24211-08-08Z | | 1AA8FR8 | | 4SA8FR8 | | | |
| 1-14 | -08 | 24211-10-08TZ | | 1AA10FR8 | | 4SA10FR8 | | | |
| 1 3/16-12 | -08 | 24211-12-08TZ | | 1AA12FR8 | | | | | |
| 13/16-16 | -10 | | | 1AA8FR10 | | | | | |
| 1-14 | -10 | 24211-10-10Z | | 1AA10FR10 | | 4SA10FR10 | | | |
| 1 3/16-12 | -10 | 24211-12-10TZ | | 1AA12FR10 | | 4SA12FR10 | | | |
| 1-14 | -12 | 24211-10-12Z | | 1AA10FR12 | | 4SA10FR12 | | | |
| 1 3/16-12 | -12 | 24211-12-12Z | | 1AA12FR12 | | 4SA12FR12 | | | |
| 1 7/16-12 | -12 | 24211-16-12TZ | | 1AA16FR12 | | 4SA16FR12 | | | |
| 1 3/16-12 | -16 | 24211-12-16Z | | 1AA12FR16 | | 4SA12FR16 | | | |
| 1 7/16-12 | -16 | 24211-16-16TZ | | 1AA16FR16 | | 4SA16FR16 | | 6SA16FR16 | |
| 1 11/16-12 | -16 | 24211-20-16TZ | | 1AA20FR16 | | 4SA20FR16 | | 6SA20FR16 | |
| 1 11/16-12 | -20 | 24211-20-20WZ | | 1AA20FR20 | | 4SA20FR20 | | 6SA20FR20 | |
| 2-12 | -20 | | | 1AA24FR20 | | | | | |
| 2-12 | -24 | 24211-24-24TZ | | 1AA24FR24 | | 4SA24FR24 | | 6SA24FR24 | |



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## FR
### ORS Female

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 9/16-18 | -04 | DSR4J-0904 | | FJ9706-0404S | | FJ7044-0404S | | | |
| 11/16-16 | -04 | | | | | | | | |
| 9/16-18 | -06 | | | | | | | | |
| 11/16-16 | -06 | DSR4J-1106 | | FJ9706-0606S | | FJ7044-0606S | | | |
| 13/16-16 | -06 | | | | | | | | |
| 11/16-16 | -08 | | | | | | | | |
| 13/16-16 | -08 | DSR4J-1308 | | FJ9706-0808S | | FJ7044-0808S | | | |
| 1-14 | -08 | | | | | | | | |
| 1 3/16-12 | -08 | | | | | | | | |
| 13/16-16 | -10 | | | | | | | | |
| 1-14 | -10 | DSR4J-1610 | | FJ9706-1010S | | FJ7044-1010S | | | |
| 1 3/16-12 | -10 | | | | | | | | |
| 1-14 | -12 | | | | | | | | |
| 1 3/16-12 | -12 | DSR4J-1912 | | FJ9706-1212S | | FJ7044-1212S | | | |
| 1 7/16-12 | -12 | | | | | | | | |
| 1 3/16-12 | -16 | | | | | | | | |
| 1 7/16-12 | -16 | DSR4J-2316 | | FJ9706-1616S | | | | | |
| 1 11/16-12 | -16 | | | | | | | | |
| 1 11/16-12 | -20 | | | FJ9706-2020S | | | | | |
| 2-12 | -20 | | | | | | | | |
| 2-12 | -24 | | | FJ9706-2424S | | | | | |



AUS 11.indd 127 11/12/23 2:38 pm

## FRA
**ORS Female**
**45 degree**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 9/16-18 | -04 | 24241-04-04Z | 23.4 | 1AA4FRA4 | 10.2 | | | | |
| 11/16-16 | -04 | 24241-06-04TZ | 18.8 | 1AA6FRA4 | 10.9 | | | | |
| 9/16-18 | -06 | 24241-04-06Z | 23.4 | 1AA4FRA6 | 10.4 | | | | |
| 11/16-16 | -06 | 24241-06-06Z | 27.1 | 1AA6FRA6 | 10.9 | 4SA6FRA6 | 10.9 | | |
| 13/16-16 | -06 | 24241-08-06TZ | 20.3 | 1AA8FRA6 | 15.0 | 4SA8FRA6 | 15.0 | | |
| 11/16-16 | -08 | 24241-06-08Z | 29.3 | 1AA6FRA8 | 10.9 | | | | |
| 13/16-16 | -08 | 24241-08-08Z | 30.7 | 1AA8FRA8 | 15.0 | 4SA8FRA8 | 15.0 | | |
| 1-14 | -08 | 24241-10-08TZ | 23.3 | 1AA10FRA8 | 16.5 | 4SA10FRA8 | 16.5 | | |
| 1 3/16-12 | -08 | 24241-12-08TZ | 23.3 | IAA12FRA8 | 21.1 | | | | |
| 1-14 | -10 | 24241-10-10Z | 34.9 | 1AA10FRA10 | 16.5 | 4SA10FRA10 | 16.5 | | |
| 1 3/16-12 | -10 | | | 1AA12FRA10 | 21.1 | | | | |
| 1-14 | -12 | 24241-10-12Z | 38.5 | 1AA10FRA12 | 16.5 | | | | |
| 1 3/16-12 | -12 | 24241-12-12Z | 39.5 | 1AA12FRA12 | 21.1 | 4SA12FRA12 | 24.0 | | |
| 1 7/16-12 | -12 | | | 1AA16FRA12 | 23.9 | 4SA16FRA12 | 28.0 | | |
| 1 3/16-12 | -16 | 24241-12-16TZ | 41.0 | 1AA12FRA16 | 21.1 | | | | |
| 1 7/16-12 | -16 | 24241-16-16TZ | 29.7 | 1AA16FRA16 | 23.9 | 4SA16FRA16 | 28.0 | 6SA16FRA16 | 28.0 |
| 1 11/16-12 | -16 | | | | | 4SA20FRA16 | 31.0 | 6SA20FRA16 | 31.0 |
| 1 11/16-12 | -20 | 24241-20-20WZ | 49.0 | 1AA20FRA20 | 25.4 | 4SA20FRB20 | 31.0 | 6SA20FRA20 | 31.0 |
| 2-12 | -20 | | | 1AA24FRA20 | 27.2 | | | | |
| 2-12 | -24 | 24241-24-24TZ | 37.7 | 1AA24FRA24 | 27.2 | 4SA24FRA24 | 43.0 | 6SA24FRA24 | 43.0 |



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## FRA
**ORS Female**
**45 degree**

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195 EC215 | | FC350 FC300 FC234 | | FC332 FC598 2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 9/16-18 | -04 | DSR7J-0904 | 14.0 | FJ9707-0404S | 10.4 | FJ7023-0404S | 10.4 | | |
| 11/16-16 | -04 | | | | | | | | |
| 9/16-18 | -06 | | | | | | | | |
| 11/16-16 | -06 | DSR7J-1106 | 19.3 | FJ9707-0606S | 10.9 | FJ7023-0606S | 11.2 | | |
| 13/16-16 | -06 | | | | | | | | |
| 11/16-16 | -08 | | | | | | | | |
| 13/16-16 | -08 | DSR7J-1308 | 23.2 | FJ9707-0808S | 15.0 | FJ7023-0808S | 15.0 | | |
| 1-14 | -08 | | | | | | | | |
| 1 3/16-12 | -08 | | | | | | | | |
| 1-14 | -10 | DSR7J-1610 | 25.7 | FJ9707-1010S | 16.5 | | | | |
| 1 3/16-12 | -10 | | | | | | | | |
| 1-14 | -12 | | | | | | | | |
| 1 3/16-12 | -12 | DSR7J-1912 | 28.5 | FJ9707-1212S | 21.1 | FJ7023-1212S | 21.1 | | |
| 1 7/16-12 | -12 | | | | | | | | |
| 1 3/16-12 | -16 | | | | | | | | |
| 1 7/16-12 | -16 | DSR7J-2316 | 30.0 | FJ9707-1616S | 23.9 | | | | |
| 1 11/16-12 | -16 | | | | | | | | |
| 1 11/16-12 | -20 | | | FJ9707-2020S | 25.4 | | | | |
| 2-12 | -20 | | | | | | | | |
| 2-12 | -24 | | | FJ9707-2424S | 27.2 | | | | |



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## FRB
**ORS Female**
**90 degree**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 9/16-18 | -04 | 24291-04-04Z | 41.0 | 1AA4FRB4 | 20.8 | | | | |
| 11/16-16 | -04 | 24291-06-04TZ | 34.5 | 1AA6FRB4 | 22.9 | | | | |
| 9/16-18 | -06 | | | 1AA4FRB6 | 20.8 | | | | |
| 11/16-16 | -06 | 24291-06-06Z | 42.5 | 1AA6FRB6 | 22.9 | 4SA6FRB6 | 22.9 | | |
| 13/16-16 | -06 | 24291-08-06TZ | 39.8 | 1AA8FRB6 | 29.2 | 4SA8FRB6 | 29.2 | | |
| 11/16-16 | -08 | 24291-06-08Z | 49.4 | | | | | | |
| 13/16-16 | -08 | 24291-08-08Z | 57.5 | 1AA8FRB8 | 29.2 | 4SA8FRB8 | 29.2 | | |
| 1-14 | -08 | 24291-10-08TZ | 46.0 | 1AA10FRB8 | 32.3 | 4SA10FRB8 | 32.3 | | |
| 1 3/16-12 | -08 | 24291-12-08TZ | 51.5 | 1AA12FBB8 | 47.8 | 4SA12FRB8 | 47.8 | | |
| 13/16-16 | -10 | | | | | | | | |
| 1-14 | -10 | 24291-10-10Z | 66.0 | 1AA10FRB10 | 32.3 | 4SA10FRB10 | 32.3 | | |
| 1 3/16-12 | -10 | | | 1AA12FRB10 | 47.8 | 4SA12FRB10 | 47.8 | | |
| 1-14 | -12 | 24291-10-12Z | 66.0 | 1AA10FRB12 | 32.3 | 4SA10FRB12 | 32.3 | | |
| 1 3/16-12 | -12 | 24291-12-12Z | 77.0 | 1AA12FRB12 | '47.8 | 4SA12FRB12 | 58.0 | | |
| 1 7/16-12 | -12 | 24291-16-12TZ | 63.0 | 1AA16FRB12 | 56.1 | 4SA16FRB12 | 71.0 | | |
| 1 3/16-12 | -16 | | | | | 4SA12FRB16 | 58.0 | | |
| 1 7/16-12 | -16 | 24291-16-16TZ | 67.5 | 1AA16FRB16 | 56.1 | 4SA16FRB16 | 71.0 | 6SA16FRB16 | 71.0 |
| 1 11/16-12 | -16 | 24291-20-16TZ | 67.5 | 1AA20FRB16 | '63.8 | 4SA20FRB16 | 78.0 | 6SA20FRB16 | 78.0 |
| 1 11/16-12 | -20 | 24291-20-20WZ | 100.0 | 1AA20FRB20 | 63.8 | 4SA20FRB20 | 78.0 | 6SA20FRB20 | 78.0 |
| 2-12 | -20 | | | 1AA24FRB20 | 68.6 | 4S24FRB20 | 86.0 | | |
| 2-12 | -24 | 24291-24-24TZ | 92.0 | 1AA24FRB24 | 68.6 | 4SA24FRB24 | 104.0 | 6SA24FRB24 | 104.0 |



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## FRB
**ORS Female**
**90 degree**

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195 EC215 | | FC350 FC300 FC234 | | FC332 FC598 2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 9/16-18 | -04 | DSR6J-0904 | 25.5 | FJ9708-0404S | 20.8 | FJ7358-0404S | 20.8 | | |
| 11/16-16 | -04 | | | | | | | | |
| 9/16-18 | -06 | | | | | | | | |
| 11/16-16 | -06 | DSR6J-1106 | 35.0 | FJ9708-0606S | 22.9 | FJ7358-0606S | 23.1 | | |
| 13/16-16 | -06 | | | | | | | | |
| 11/16-16 | -08 | | | | | | | | |
| 13/16-16 | -08 | DSR6J-1308 | 42.2 | FJ9708-0808S | 29.2 | FJ7358-0808S | 29.2 | | |
| 1-14 | -08 | | | | | | | | |
| 1 3/16-12 | -08 | | | | | | | | |
| 13/16-16 | -10 | | | | | | | | |
| 1-14 | -10 | DSR6J-1610 | 43.5 | FJ9708-1010S | 32.3 | | | | |
| 1 3/16-12 | -10 | | | | | | | | |
| 1-14 | -12 | | | | | | | | |
| 1 3/16-12 | -12 | DSR6J-1912 | 58.7 | FJ9708-1212S | 47.8 | FJ7358-1212S | 48.3 | | |
| 1 7/16-12 | -12 | | | | | | | | |
| 1 3/16-12 | -16 | | | | | | | | |
| 1 7/16-12 | -16 | DSR6J-2316 | 65.0 | FJ9708-1616S | 56.1 | | | | |
| 1 11/16-12 | -16 | | | | | | | | |
| 1 11/16-12 | -20 | | | FJ9708-2020S | 63.8 | | | | |
| 2-12 | -20 | | | | | | | | |
| 2-12 | -24 | | | FJ9708-2424S | 68.6 | | | | |



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## FRC
**ORS Female long**
**90 degree**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 9/16-18 | -04 | | | 1AA4FRC4 | 47.5 | | | | |
| 11/16-16 | -04 | | | 1AA6FRC4 | 54.1 | | | | |
| 13/16-16 | -04 | | | 1AA8FRC4 | 64.8 | | | | |
| 11/16-16 | -06 | | | 1AA6FRC6 | 54.1 | 4SA6FRC6 | 54.1 | | |
| 13/16-16 | -06 | | | 1AA8FRC6 | 64.8 | 4SA8FRC6 | 64.8 | | |
| 11/16-16 | -08 | | | | | | | | |
| 13/16-16 | -08 | | | 1AA8FRC8 | 64.8 | 4SA8FRC8 | 64.8 | | |
| 1-14 | -08 | | | 1AA10FRC8 | 70.1 | 4SA10FRC8 | 70.1 | | |
| 1 3/16-12 | -08 | | | | | | | | |
| 13/16-16 | -10 | | | | | | | | |
| 1-14 | -10 | | | 1AA10FRC10 | 70.1 | 4SA10FRC10 | 70.1 | | |
| 1 3/16-12 | -10 | | | | | | | | |
| 1-14 | -12 | | | | | 4SA10FRC12 | 70.0 | | |
| 1 3/16-12 | -12 | | | 1AA12FRC12 | 96.0 | 4SA12FRC12 | 96.0 | | |
| 1 7/16-12 | -12 | | | 1AA16FRC12 | 114.3 | 4SA16FRC12 | 114.0 | | |
| 1 3/16-12 | -16 | | | | | | | | |
| 1 7/16-12 | -16 | | | 1AA16FRC16 | 114.3 | 4SA16FRC16 | 114.0 | | |
| 1 11/16-12 | -16 | | | | | | | | |
| 1 11/16-12 | -20 | | | 1AA20FRC20 | 129.3 | 4SA20FRC20 | 120.0 | | |
| 2-12 | -20 | | | 1AA24FRC20 | 140.7 | 4SA24FRC20 | 141.0 | | |
| 2-12 | -24 | | | 1AA24FRC24 | 140.7 | 4SA24FRC24 | 141.0 | | |



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## FRC
**ORS Female long**
**90 degree**

| | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 9/16-18 | -04 | | | FJ9709-0404S | | | | | |
| 11/16-16 | -04 | | | | | | | | |
| 9/16-18 | -06 | | | | | | | | |
| 11/16-16 | -06 | | | FJ9709-0606S | 54.1 | | | | |
| 13/16-16 | -06 | | | | | | | | |
| 11/16-16 | -08 | | | | | | | | |
| 13/16-16 | -08 | | | FJ9709-0808S | 63.8 | | | | |
| 1-14 | -08 | | | | | | | | |
| 1 3/16-12 | -08 | | | | | | | | |
| 13/16-16 | -10 | | | | | | | | |
| 1-14 | -10 | | | FJ9709-1010S | 70.1 | | | | |
| 1 3/16-12 | -10 | | | | | | | | |
| 1-14 | -12 | | | | | | | | |
| 1 3/16-12 | -12 | | | FJ9709-1212S | 96.0 | | | | |
| 1 7/16-12 | -12 | | | | | | | | |
| 1 3/16-12 | -16 | | | | | | | | |
| 1 7/16-12 | -16 | | | FJ9709-1616S | 114.3 | | | | |
| 1 11/16-12 | -16 | | | | | | | | |
| 1 11/16-12 | -20 | | | FJ9709-2020S | 129.3 | | | | |
| 2-12 | -20 | | | | | | | | |
| 2-12 | -24 | | | | | | | | |



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## LS
**Life Saver**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Bore | Hose | Part No. | "H" | Part No. | "H' | Part No. | "H' | Part No. | "H' |
| 1/4" | -04 | | | 1A4LS4 | | | | | |
| 5/16" | -05 | | | | | | | | |
| 3/8" | -06 | | | 1A6LS6 | | | | | |
| 1/2" | -08 | | | 1A8LS8 | | | | | |
| 5/8" | -10 | | | 1A10LS10 | | | | | |
| 3/4" | -12 | | | 1A12LS12 | | | | | |
| 1" | -16 | | | 1A16LS16 | | | | | |
| 1 1/4" | -20 | | | 1AT20LS20 | | | | | |
| 1 1/2" | -24 | | | 1A24LS24 | | | | | |
| 2" | -32 | | | 1A32LS32 | | | | | |



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## LS
**Life Saver**

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H' | Part No. | "H' | Part No. | "H' | Part No. | "H' |
| 1/4" | -04 | | | 190000-4S | | | | | |
| 5/16" | -05 | | | 190000-5S | | | | | |
| 3/8" | -06 | | | 190000-6S | | | | | |
| 1/2" | -08 | | | 190000-8S | | | | | |
| 5/8" | -10 | | | 190000-10S | | | | | |
| 3/4" | -12 | | | 190000-12S | | | | | |
| 1" | -16 | | | 190000-16S | | | | | |
| 1 1/4" | -20 | | | 190000-20S | | | | | |
| 1 1/2" | -24 | | | 190000-24S | | | | | |
| 2" | -32 | | | 190000-32S | | | | | |



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## MJ
**Male JIC**

| | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|
| | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 7/16-20 | -04 | 16711-04-04Z | | 1AA4MJ4 | | | | | |
| 1/2-20 | -04 | 16711-05-04Z | | 1AA5MJ4 | | | | | |
| 9/16-18 | -04 | 16711-06-04Z | | 1AA6MJ4 | | | | | |
| 9/16-18 | -06 | 16711-06-06Z | | 1AA6MJ6 | | 4SA6MJ6 | | | |
| 3/4-16 | -06 | 16711-08-06Z | | 1AA8MJ6 | | 4SA8MJ6 | | | |
| 3/4-16 | -08 | 16711-08-08Z | | 1AA8MJ8 | | 4SA8MJ8 | | | |
| 7/8-14 | -08 | 16711-10-08Z | | 1AA10MJ8 | | 4SA10MJ8 | | | |
| 1 1/16-12 | -08 | 16711-12-08Z | | 1AA12MJ8 | | 4SA12MJ8 | | | |
| 7/8-14 | -10 | 16711-10-10Z | | 1AA10MJ10 | | 4SA10MJ10 | | | |
| 1 1/16-12 | -10 | 16711-12-10Z | | 1AA12MJ10 | | 4SA12MJ10 | | | |
| 7/8-14 | -12 | 16711-10-12Z | | 1AA10MJ12 | | 4SA10MJ12 | | | |
| 1 1/16-12 | -12 | 16711-12-12Z | | 1AA12MJ12 | | 4SA12MJ12 | | | |
| 1 3/16-12 | -12 | 16711-14-12Z | | 1AA14MJ12 | | 4SA14MJ12 | | | |
| 1 5/16-12 | -12 | 16711-16-12Z | | 1AA16MJ12 | | 4SA16MJ12 | | | |
| 1 5/16-12 | -16 | 16711-16-16Z | | 1AA16MJ16 | | 4SA16MJ16 | | | |
| 1 5/8-12 | -20 | 16711-20-20Z | | 1AA20MJ20 | | 4SA20MJ20 | | | |
| 1 7/8-12 | -24 | 16711-24-24Z | | 1AA24MJ24 | | 4SA24MJ24 | | | |
| 2 1/2-12 | -32 | 16711-32-32Z | | 1AA32MJ32 | | 4SA32MJ32 | | | |



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## MJ
**Male JIC**

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195<br>EC215 | | FC350 FC300<br>FC234 | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 7/16-20 | -04 | DSR09-0704 | | 4414-4S | | 190672-4B | | | |
| 1/2-20 | -04 | DSR09-0804 | | | | | | | |
| 9/16-18 | -04 | DSR09-0904 | | | | | | | |
| 9/16-18 | -06 | DSR09-0906 | | 4414-6S | | 190672-6B | | | |
| 3/4-16 | -06 | DSR09-1206 | | | | | | | |
| 3/4-16 | -08 | DSR09-1208 | | 4414-8S | | | | | |
| 7/8-14 | -08 | DSR09-1408 | | | | | | | |
| 1 1/16-12 | -08 | DSR09-1708 | | | | | | | |
| 7/8-14 | -10 | DSR09-1410 | | 4414-10S | | | | | |
| 1 1/16-12 | -10 | DSR09-1710 | | 4414-12-10S | | | | | |
| 7/8-14 | -12 | | | | | | | | |
| 1 1/16-12 | -12 | DSR09-1712 | | 4414-12S | | | | | |
| 1 3/16-12 | -12 | DSR09-1712 | | | | | | | |
| 1 5/16-12 | -12 | DSR09-2112 | | 4414-16-12S | | | | | |
| 1 5/16-12 | -16 | DSR09-2116 | | 4414-16S | | | | | |
| 1 5/8-12 | -20 | | | 4414-20S | | | | | |
| 1 7/8-12 | -24 | | | 4414-24S | | | | | |
| 2 1/2-12 | -32 | | | 4414-32S | | | | | |



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## MP
**NPT Male**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 1/8-27 | -04 | 15611-02-04Z | | 1AA2MP4 | | | | | |
| 1/4-18 | -04 | 15611-04-04Z | | 1AA4MP4 | | | | | |
| 3/8-18 | -04 | 15611-06-04Z | | 1AA6MP4 | | | | | |
| 1/4-18 | -05 | | | | | | | | |
| 1/4-18 | -06 | 15611-04-06Z | | 1AA4MP6 | | | | | |
| 3/8-18 | -06 | 15611-06-06Z | | 1AA6MP6 | | 4SA6MP6 | | | |
| 1/2-14 | -06 | 15611-08-06Z | | 1AA8MP6 | | 4SA8MP6 | | | |
| 1/4-18 | -08 | | | 1AA4MP8 | | 4SA4MP8 | | | |
| 3/8-18 | -08 | 15611-06-08Z | | 1AA6MP8 | | 4SA6MP8 | | | |
| 1/2-14 | -08 | 15611-08-08Z | | 1AA8MP8 | | 4SA8MP8 | | | |
| 3/4-14 | -08 | 15611-1208Z | | 1AA12MP8 | | 4SA12MP8 | | | |
| 1/2-14 | -10 | 15611-08-10Z | | 1AA8MP10 | | 4SA8MP10 | | | |
| 3/4-14 | -10 | 15611-12-10Z | | 1AA12MP10 | | 4SA12MP10 | | | |
| 1/2-14 | -12 | 15611-08-12Z | | 1AA8MP12 | | 4SA8MP12 | | | |
| 3/4-14 | -12 | 15611-12-12Z | | 1AA12MP12 | | 4SA12MP12 | | | |
| 1-11 1/2 | -12 | 15611-16-12Z | | 1AA16MP12 | | 4SA16MP12 | | | |
| 3/4-14 | -16 | 15611-12-16Z | | 1AA12MP16 | | 4SA12MP16 | | | |
| 1-11 1/2 | -16 | 15611-16-16Z | | 1AA16MP16 | | 4SA16MP16 | | 6SA16MP16 | |
| 1 1/4-11 1/2 | -16 | 15611-20-16Z | | 1AA20MP16 | | 4SA20MP16 | | | |
| 1-11 1/2 | -20 | | | 1AA16MP20 | | 4SA16MP20 | | | |
| 1 1/4-11 1/2 | -20 | 15611-20-20Z | | 1AA20MP20 | | 4SA20MP20 | | 6SA20MP20 | |
| 1 1/2-11 1/2 | -24 | 15611-24-24Z | | 1AA24MP24 | | 4SA24MP24 | | 6SA24MP24 | |
| 2-11 1/2 | -32 | 15611-32-32Z | | 1AA32MP32 | | 4SA32MP32 | | 6SA32MP32 | |



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## MP
### NPT Male

| | | Reusable | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 & 2 wire | | SAE100R5 | | Socketless | | Teflon | |
| | | GH781 GH195 EC215 | | FC350 FC300 FC234 | | FC332 FC598 2556 | | 2807 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 1/8-27 | -04 | DSR10-0204 | | 4412-2-4S | | 4738-2-4B | | 38-190627-2-4 | |
| 1/4-18 | -04 | DSR10-0404 | | 4412-4-4S | | 4738-4-4B | | 38-190627-4-4 | |
| 3/8-18 | -04 | | | | | | | | |
| 1/4-18 | -05 | | | 4412-4-5S | | | | 38-190627-4-5 | |
| 1/4-18 | -06 | DSR10-0406 | | 4412-4-6S | | 4738-4-6B | | 38-190627-4-6 | |
| 3/8-18 | -06 | DSR10-0606 | | 4412-6-6S | | 4738-6-6B | | 38-190627-6-6 | |
| 1/2-14 | -06 | | | | | | | | |
| 1/4-18 | -08 | | | | | | | | |
| 3/8-18 | -08 | DSR10-0608 | | 4412-6-8S | | 4738-6-8B | | 38-190627-6-8 | |
| 1/2-14 | -08 | DSR10-0808 | | 4412-8-8S | | 4738-8-8B | | | |
| 3/4-14 | -08 | | | | | | | | |
| 1/2-14 | -10 | | | 4412-8-10S | | 4738-8-10B | | 38-190627-8-10 | |
| 3/4-14 | -10 | DSR10-1210 | | 4412-12-10S | | | | | |
| 1/2-14 | -12 | | | 4412-8-12S | | | | | |
| 3/4-14 | -12 | DSR10-1212 | | 4412-12-12S | | 4738-12-12B | | 38-190627-12-12 | |
| 1-11 1/2 | -12 | | | | | | | | |
| 3/4-14 | -16 | | | | | | | | |
| 1-11 1/2 | -16 | DSR10-1616 | | 412-16-16S | | | | 38-190627-16-16 | |
| 1 1/4-11 1/2 | -16 | | | | | | | | |
| 1-11 1/2 | -20 | | | | | | | | |
| 1 1/4-11 1/2 | -20 | | | 412-20-20S | | | | 38-190627-20-20 | |
| 1 1/2-11 1/2 | -24 | | | 412-24-24S | | | | | |
| 2-11 1/2 | -32 | | | 412-32-32S | | | | | |



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## JF
### JIS Female

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| 1/4-19 | -04 | 29611-04-04Z | | 1A4JF4 | | | | | |
| 3/8-19 | -06 | 29611-06-06Z | | 1A6JF6 | | 4S6JF6 | | | |
| 1/2-14 | -08 | 29611-08-08Z | | 1A8JF8 | | 4S8JF8 | | | |
| 3/4-14 | -12 | 29611-12-12Z | | 1A12JF12 | | 4S12JF12 | | | |
| 1-11 | -16 | 29611-16-16Z | | 1A16JF16 | | 4S16JF16 | | | |
| 1 1/4-11 | -20 | 29611-20-20WZ | | 1A20JF20 | | 4S20JF20 | | | |
| 1 1/2-11 | -24 | 29611-24-24WZ | | | | | | | |
| 2-11 | -32 | 29611-32-32WZ | | | | | | | |



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## KF
**Komatsu female**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| M14 X 1.5 | -04 | 28611-14-04Z | | 1A4KF4 | | | | | |
| M18 X 1.5 | -06 | 28611-18-06Z | | 1A6KF6 | | | | | |
| M22 X 1.5 | -08 | 28611-22-08Z | | 1A8KF8 | | 4S8KF8 | | | |
| M24 X 1.5 | -10 | 28611-24-10Z | | 1A10KF10 | | | | | |
| M24 X 1.5 | -12 | 28611-24-12Z | | 1A10KF12 | | | | | |
| M30 X 1.5 | -12 | 28611-30-12Z | | 1A12KF12 | | 4S12KF12 | | | |
| M33 X 1.5 | -16 | 28611-33-16Z | | 1A16KF16 | | 4S16KF16 | | | |
| M36 X 1.5 | -20 | 28611-36-20Z | | 1A20KF20 | | 4S20KF20 | | | |
| M42 X 1.5 | -24 | 28611-42-24WZ | | | | | | | |



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## KS
**Komatsu flange**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -10 | -10 | | | 1A10KS10 | | | | | |

## KSA
**Komatsu female**
**45 deg**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | List |
| -10 | -10 | | | 1A10KSA10 | 21.8 | | | | |



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## MF
### Male inverted flare

| | | Reusable | | | |
|---|---|---|---|---|---|
| | | Socketless | | Teflon | |
| | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" |
| 7/16-24 | -04 | 190111-4S | | 4740-4B | |
| 1/2-20 | -04 | | | 4740-5-4B | |
| 1/2-20 | -05 | 190111-5S | | | |
| 1/2-20 | -06 | 190111-5-6S | | | |
| 5/8-18 | -06 | 190111-6S | | 4740-6B | |
| 5/8-18 | -08 | 190111-6-8S | | | |
| 3/4-18 | -08 | 190111-8S | | 4740-8B | |

## MF
### Male inverted flare
### 15 deg swept blend

| | | Reusable | | | |
|---|---|---|---|---|---|
| | | Socketless | | Teflon | |
| | | FC332 FC598<br>2556 | | 2807 | |
| | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" |
| 5/8-18 | -06 | 190350-6S | 9.4 | | |



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## KSB
**Komatsu flange**
**90 deg**

| | | Winner Braided Hose | | Braided Hose | | Four Spiral Hose | | Six Spiral Hose | |
|---|---|---|---|---|---|---|---|---|---|
| | | Two Piece Fittings | | TTC | | 4S | | 6S | |
| | | EC215<br>USE 03310-SIZE SOCKETS | | GH681 GH781 GH735<br>GH195 FC619 FC693<br>EC215 FC613 FC579<br>EC881 GH194 WH004 | | GH493 FC736 FC636<br>GH506 EC525<br>FC500 (-12 TO -24 )<br>EC600 ( -12 & -16 ) | | GH466 ( -20 & -24 )<br>FC500-32<br>EC600-20 to -32 | |
| | | | | | | | | | |
| Flange | Hose | Part No. | "H" | Part No. | "H" | Part No. | "H" | Part No. | "H" |
| -10 | -10 | | | 1A10KSB10 | 51.3 | | | | |



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## MFA
**Male inverted flare**
**45 deg swept blend**

| | | SAE100R5 | | Socketless | |
|---|---|---|---|---|---|
| | | FC350 FC300 FC234 | | FC332 FC598 2556 | |
| | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" |
| 7/16-24 | -04 | 190371-4S | 24.4 | 190944-4S | 24.4 |
| 1/2-20 | -05 | 190371-5S | 24.4 | | |
| 5/8-18 | -06 | 190371-6S | 24.4 | 190944-6S | 24.4 |
| 3/4-18 | -08 | 190371-8S | 23.6 | | |
| 7/8-18 | -10 | 190371-10S | 26.2 | | |

## MFB
**Male inverted flare**
**90 deg swept blend**

| | | SAE100R5 | | Socketless | |
|---|---|---|---|---|---|
| | | | | | |
| Thread | Hose | Part No. | "H" | Part No. | "H" |
| 7/16-24 | -04 | 190235-4S | 42.9 | 190327-4S | 42.9 |
| 1/2-20 | -05 | 190235-5S | 42.9 | 190327-6S | 43.9 |
| 1/2-20 | -06 | 190235-5-6S | 43.9 | | |
| 5/8-18 | -06 | 190235-6S | 43.9 | | |
| 11/16-18 | -06 | 190235-7-6S | 43.9 | | |
| 5/8-18 | -08 | 190235-6-8S | 43.9 | | |
| 11/16-18 | -08 | 190235-7-8S | 43.9 | | |
| 3/4-18 | -08 | 190235-8S | 44.5 | | |



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## Bump tube
**'O' Ring swivel**

| | Reusable |
|---|---|
| | SAE100R5 |
| | FC350 FC300<br>FC234 |
| | |

| Thread | Hose | Part No. | "H" |
|---|---|---|---|
| 5/8-18 | -06 | FC7048-0606S | |
| 3/4-16 | -08 | FC7048-0808S | |
| 7/8-14 | -10 | FC7048-1010S | |
| 1 1/16-14 | -12 | FC7048-1212S | |

## Bump tube
**Male**

| | Reusable |
|---|---|
| | SAE100R5 |
| | FC350 FC300<br>FC234 |
| | |

| Thread | Hose | Part No. | "H" |
|---|---|---|---|
| 5/8-18 | -06 | FC7646-0606S | |
| 3/4-18 | -08 | FC7646-0808S | |
| 7/8-18 | -10 | FC7646-1010S | |

## Bump tube
**'O' Ring swivel**
**90 deg swept bend**

| | Reusable |
|---|---|
| | SAE100R5 |
| | |

| Thread | Hose | Part No. | "H" |
|---|---|---|---|
| 5/8-18 | -06 | FC7573-0606S | |
| 3/4-16 | -08 | FC7573-0808S | |
| 7/8-14 | -10 | FC7573-1010S | |
| 1 1/16-14 | -12 | FC7573-1212S | |

## Bump tube
**Male**
**90 deg swept bend**

| | Reusable |
|---|---|
| | SAE100R5 |
| | |

| Thread | Hose | Part No. | "H" |
|---|---|---|---|
| 5/8-18 | -06 | FC7662-0606S | |
| 7/8-18 | -10 | FC7662-1010S | |



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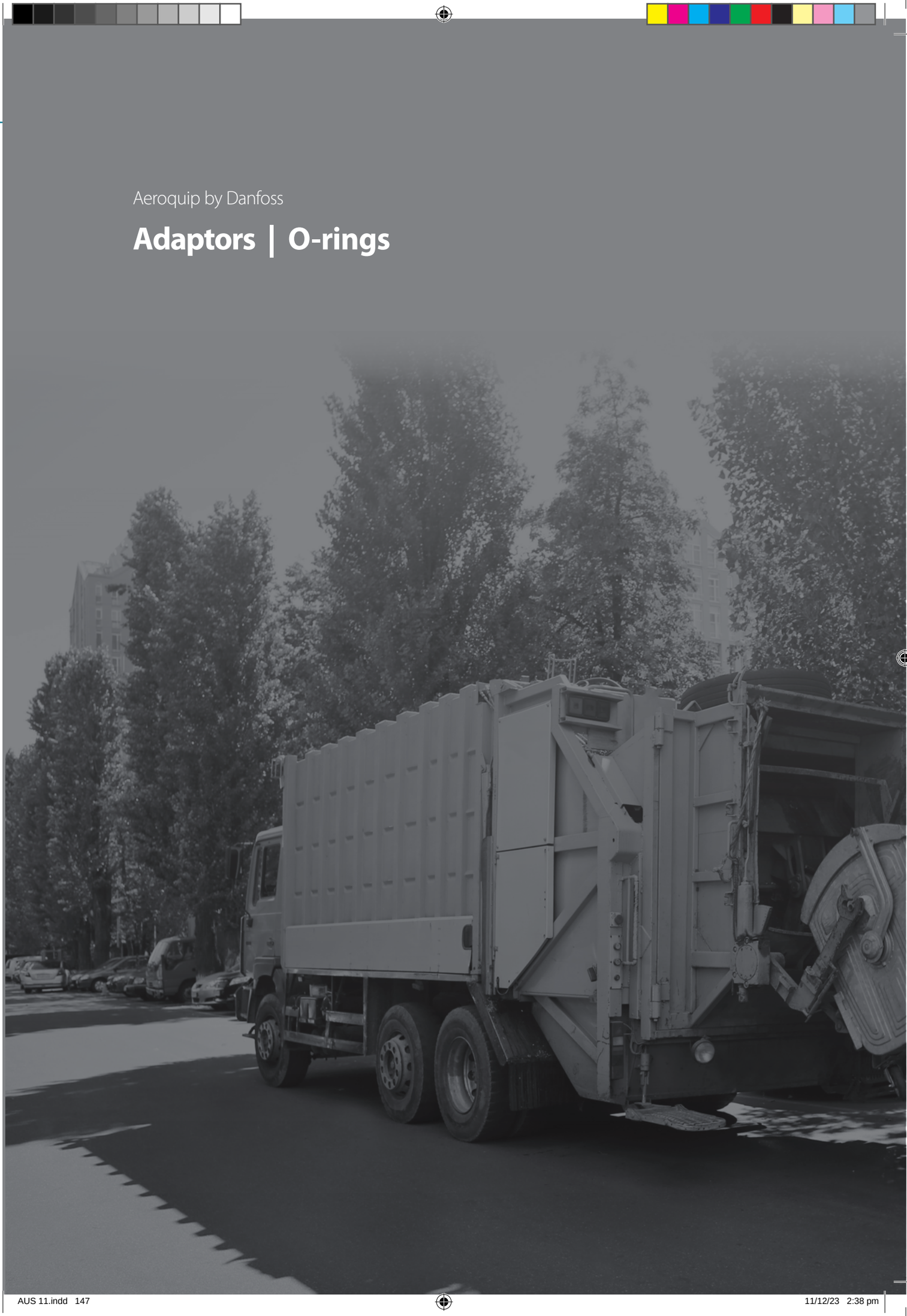
Aeroquip by Danfoss

# Adaptors | O-rings



# O-Rings

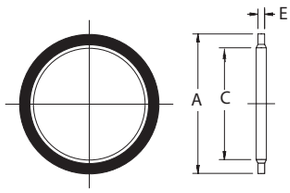
## O-Ring seal kit FF16087-01

Includes: metal box,
O-Rings for ORS –4 through –24,
O-Ring boss –04 through –32,
Split flange –08 through –32,
24 packages with twelve
90 durometer nitrile
O-Ring per package.
Replacement O-Ring can be ordered individually by part number listed.

FF16087-01

| O-Ring seal kit | | |
|---|---|---|
| Connection | Size | Individual O-Ring part # |
| ORS | -04 | **FF9446–11** |
| ORS | -06 | **FF9446–12** |
| ORS | -08 | **FF9446–14** |
| ORS | -10 | **FF9446–16** |
| ORS | -12 | **FF9446–18** |
| ORS | -16 | **FF9446–21** |
| ORS | -20 | **FF9446–25** |
| ORS | -24 | **FF9446–29** |
| O-Ring Boss | -04 | **22617–4** |
| O-Ring Boss | -05 | **22617–5** |
| O-Ring Boss | -06 | **22617–6** |
| O-Ring Boss | -08 | **22617–8** |
| O-Ring Boss | -10 | **22617–10** |
| O-Ring Boss | -12 | **22617–12** |
| O-Ring Boss | -16 | **22617–16** |
| O-Ring Boss | -20 | **22617–20** |
| O-Ring Boss | -24 | **22617–24** |
| O-Ring Boss | -32 | **22617–32** |
| Split Flange | -08 | **FF9446–210** |
| Split Flange | -12 | **FF9446–214** |
| Split Flange | -16 | **FF9446–219** |
| Split Flange | -20 | **FF9446–222** |
| Split Flange | -24 | **FF9446–225** |
| Split Flange | -32 | **FF9446–228** |

BSPP bonded seal
for DIN 3852-2 ports
FF9895




| O-Ring for split flange | | | | |
|---|---|---|---|---|
| Bonded Seal Part # | BSPP Thread Size | A Ref | B Ref | C ref |
| | inch | inch | inch | inch |
| **FF9895-02** | 1/8-28 | 0.625 | 0.403 | 0.080 |
| **FF9895-04** | 1/4-19 | 0.810 | 0.536 | 0.080 |
| **FF9895-06** | 3/8-19 | 0.937 | 0.675 | 0.080 |
| **FF9895-08** | 1/2-14 | 1.125 | 0.843 | 0.097 |
| **FF9895-10** | 5/8-14 | 1.250 | 0.920 | 0.097 |
| **FF9895-12** | 3/4-14 | 1.375 | 1.060 | 0.097 |
| **FF9895-16** | 1-11 | 1.685 | 1.329 | 0.133 |
| **FF9895-20** | 1 1/4-11 | 2.062 | 1.685 | 0.133 |
| **FF9895-24** | 1 1/2-11 | 2.307 | 1.902 | 0.133 |
| **FF9895-32** | 2-11 | 2.875 | 2.380 | 0.133 |

Material: steel with bonded nitrile (buna-n) seal.



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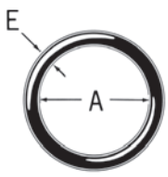
# O-Rings & kits

## Designating separate ORS O-Ring boss

To order Danfoss O-Ring separately without fittings specify the size and material by using the O-Ring base number and dash size. The charts offer a simple method to assure the correct O-Ring for your application.




| ORS O-Rings | | |
|---|---|---|
| O-Ring Base # | Material | Operating temperature range |
| **FF9446 (Standard)** | Buna–N Nitrile Rubber 90 Durometer | –40°F to +250°F (–40°C to +121°C) |
| **FF9807** | EPDM Ethylene propylene diene monomer | –65°F to +300°F (–55°C to +150°C) |
| **22046** | Viton Fluoroelastomer 90 Durometer | –15°F to +400°F (–25°C to +205°C) |
| **FF9855** | Buna–N, Low Temperature Nitrile Rubber 90 Durometer | –65°F to +225°F (–55°C to +107°C) |
| **22546** | Neoprene 90 Durometer | –65°F to +300°F (–55°C to +150°C) |

| ORS O-Ring size | | | | | |
|---|---|---|---|---|---|
| O-Ring dash size | Tube size | A | | E | |
| | mm | mm | in | mm | in |
| -11 | -04 | 7,6 | 0.301 | 1,8 | 0.07 |
| -12 | -06 | 9,2 | 0.364 | 1,8 | 0.07 |
| -14 | -08 | 12,4 | 0.489 | 1,8 | 0.07 |
| -16 | -10 | 15,6 | 0.614 | 1,8 | 0.07 |
| -18 | -12 | 18,8 | 0.739 | 1,8 | 0.07 |
| -21 | -16 | 23,5 | 0.926 | 1,8 | 0.07 |
| -25 | -20 | 29,9 | 1.176 | 1,8 | 0.07 |
| -29 | -24 | 37,8 | 1.489 | 1,8 | 0.07 |



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## BSPT

4008/135

BSPT X BSPT

Page No D8

B2015

BSPT X BSPP

Page No D8

E135/E136

BSPP M/Dowty

Page No D8

B2082

BSPT Plug

Page No D9

B2247

BSPT Male 45

Page No D9

B2257

BSPT Tee

Page No D9

B2045

BSP X BSPT F X M

Page No D10

4813

BSPT Red Bush

Page No D10

B2096

BSPT Socket

Page No D10

B2049

BSPT X BSPP M X F

Page No D11

B2047

BSPT M X F SW 90

Page No D11

2087

BSPT Fem 90

Page No D11

B2089

BSPT M X F 90

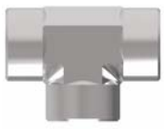
Page No D11

4012

BSPT Male 90

Page No D11

B2090



BSPT Fem Tee

Page No D11

## BSPP

B2046

BSPP M X F

Page No D12

B2086

BSPP Plug

Page No D12

## BSPP

D275

BSPP M B'Head

Page No D13

B2093

BSP M X F X M Tee

Page No D13

B210292

BSPP Fem Cap

Page No D13

## BSPT X JIC

4009

BSPT X JIC M X M

Page No D14

GG210

BSPT X JIC M 45

Page No D14

6720

BSPT X JIC M 90

Page No D14

B2250

BSPT X JIC F

Page No D15



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## BSPP X JIC

| GG106 | D226 | GG206 | GG306 | DA226 |
|---|---|---|---|---|
| | | | | |
| BSPP X JIC M X M | BSPP X JIC M X M | BSPP X JIC M 45 | BSPP X JIC M 90 | BSPP X JIC M X F |
| | Encaptulated o ring | | | |
| Page No D15 | Page No D15 | Page No D16 | Page No D16 | Page No D16 |

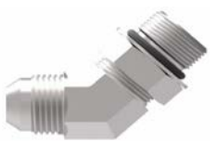
## BSPT X UNO'

| 6821 |
|---|
| |
| BSPT X UNO Male |
| Page No D17 |

## BSPP X UNO'

| B6831 | B2032 |
|---|---|
| | |
| BSPP X UNO Male | BSPPX UNO M 90 |
| Page No D17 | Page No D17 |

## UNO' X JIC

| 202702 | 2061 | 2062 | 2266 | 900598 | 203003 |
|---|---|---|---|---|---|
| |  | | | | |
| UNO' x JIC M | UNO' x JIC M 45 | UNO' x JIC M 90 | UNO' M x JIC F | UNO' CAP | UNO' x JIC M TEE |
| Page No D18 | Page No D18 | Page No D18 | Page No D19 | Page No D19 | Page No D19 |

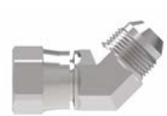
## UNO' X JIC

| 203005 |
|---|
| |
| UNO' x JIC M TEE |
| Page No D19 |

## JIC X JIC

| 2027 | 2041 | 2042 | 2039 |
|---|---|---|---|
| | | | |
| JIC M X M | JIC M X M B'HEAD | JIC M B'HEAD 45 | JIC M X M 90 |
| Page No D20 | Page No D20 | Page No D20 | Page No D20 |

## JIC X JIC

| 2043 | 2033 | 221501 | 2215 | 2070 | 2071 |
|---|---|---|---|---|---|
| | | | |  | |
| JIC M B'HEAD 90 | JIC MALE TEE | JIC F X M REDUCER | JIC F X M | JIC F X M 45 | JIC F X M 90 |
| Page No D20 | Page No D20 | Page No D21 | Page No D21 | Page No D21 | Page No D22 |

## JIC X JIC

| FF5163 | FF5164 | 500454 | 504095 | 203101 | 203102 |
|---|---|---|---|---|---|
| | | | | | |
| JIC F X M 90 | JIC F X M 90 LONG | JIC F X M 90 | JIC F X M 90 LONG | JIC M X M X F TEE | JIC F X M X M TEE |
| Page No D22 | Page No D22 | Page No D22 | Page No D22 | Page No D22 | Page No D23 |

## JIC X JIC

| 900599 | 210292 | 73014 | TW25 | 1290 | FC2875 |
|---|---|---|---|---|---|
| | | | | | |
| JIC PLUG | JIC CAP | JIC M TUBEWELD | JIC F TUBEWELD | JIC FLARE NUT | JIC FLARELESS NUT |
| Page No D23 | Page No D23 | Page No D23 | Page No D23 | Page No D24 | Page No D24 |

## JIC X JIC

| 900605 | FF9605 |
|---|---|
| | |
| JIC FLARE SLEEVE | JIC F'LESS SLEEVE |
| Page No D24 | Page No D24 |

## JIC X CD61 Flange

## JIC X CD62 Flange

| 500025 | 500053 | 500024 | FF5541 | FF5539 | FF5540 |
|---|---|---|---|---|---|
| | | | | | |
| JICM X CD61 FLANGE | JICM X CD61 FLANGE 45 | JICM X CD61 FLANGE 90 | JICM X CD62 FLANGE | JICM X CD62 FLANGE 45 | JICM X CD62 FLANGE 90 |
| Page No D25 | Page No D25 | Page No D25 | Page No D26 | Page No D26 | Page No D26 |

## NPT X NPT

| 2083 | 2085 | 2257 | 2081 | 2045 | 2049 |
|---|---|---|---|---|---|
| | | | | | |
| NPT MALE | NPT MALE 90 | NPT MALE TEE | NPT M X F BUSH | NPT M X F | NPT M X F 45 DEG |
| Page No D26 | Page No D26 | Page No D26 | Page No D27 | Page No D27 | Page No D27 |



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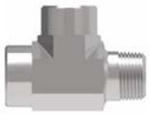
## NPT X NPT

| 2047 | 2091 | 2092 | 2096 | 2087 |
|---|---|---|---|---|
| | |  | | |
| NPT M X F 90 DEG | NPT F X F XM TEE | NPT M X F X F TEE | NPT FEM SOCKET | NPT F X F 90 DEG |
| Page No D28 | Page No D28 | Page No D28 | Page No D28 | Page No D28 |

## NPT X NPT

| 2090 | 2082 |
|---|---|
| | |
| NPT FEMALE TEE | NPT PLUG |
| Page No D29 | Page No D29 |

## NPT X JIC

| 2021 | 2023 | 2024 | 2028 | 2022 | 2025 |
|---|---|---|---|---|---|
| | | | | | |
| NPT X JIC MALE | NPT X JIC MALE 45 | NPT X JIC MALE 90 | NPT X JIC M TEE | NPT X JIC F X M | NPT X JIC F X M 90 |
| Page No D30 | Page No D30 | Page No D30 | Page No D31 | Page No D31 | Page No D31 |

## ORS X UNO'

| FF1852 | FF1854 | FF2086 | FF1868 | FF1861 | FF1865 |
|---|---|---|---|---|---|
| | | | | | |
| ORS X UNO MALE | ORS X UNO M LONG | ORS X UNO M 45 | ORS X UNO M 90 | ORS X UNO M TEE | ORS X UNO M TEE |
| Page No D32 | Page No D32 | Page No D32 | Page No D34 | Page No D34 | Page No D34 |

## ORS X ORS

| FF2000 | FF1994 | FF2035 | FF2030 | FF1898 | FF2281 |
|---|---|---|---|---|---|
| | | | | | |
| ORS M X M | ORS M X M B'HEAD | ORS M X M 90 | ORS M B'HEAD 90 | ORS MALE TEE | ORS M X F |
| Page No D34 | Page No D34 | Page No D34 | Page No D35 | Page No D35 | Page No D35 |

## ORS X ORS

| FF2098 | FF2114 | FF1857 | FF9863 | FF9767 |
|---|---|---|---|---|
| | | | | |
| ORS M X F 90 | ORS F X M X M TEE | ORS M X M X F TEE | ORS CAP | ORS PLUG |
| Page No D35 | Page No D35 | Page No D35 | Page No D36 | Page No D36 |

## ORS X BSPP

| B2033 | B2034 |
|---|---|
| | |
| ORS X BSPP MXM | ORS F X M 90 |
| Page No D36 | Page No D36 |

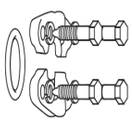
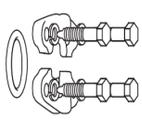
## MET X JIC

| D147 |
|---|
| |
| MET X JIC MXM |
| Page No D37 |

## SPLIT FLANGES

| 449-74446 | FC3245 |
|---|---|
| | |
| CODE 61 SPLIT FL | CODE 62 SPLIT FL |
| Page No D37 | Page No D37 |

## SPLIT FLANGE KITS

| FF593 | FF595 |
|---|---|
|  |  |
| CD 61 KIT | CD 62 KIT |
| Page No D38 | Page No D38 |

## RUBBER RINGS

| FF9446 | FF90319 | FF91157 | FF9446/FF9016 /22046 | DS | DMS |
|---|---|---|---|---|---|
| | | | | | |
| ORS O RING | CAT D RING | 4S/6S STEM O RING | FLANGE O RINGS | BSP DOWTY | METRIC DOWTY |
| Page No D39 | Page No D39 | Page No D39 | Page No D39 | Page No D40 | Page No D40 |



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| BSPT | | | | |
|---|---|---|---|---|
| | | BSPT X BSPT<br>M X M | BSPT X BSPP<br>M X M | BSPP MALE<br>Use Dowty seal |
| Thread 1 | Thread 2 | Part No. | Part No. | Part No. |
| BSP | BSP | | | |
| 1/8-28 | 1/8-28 | 4008-2 | | E136-2 |
| 1/8-28 | 1/4-19 | 135-2-4 | | |
| 1/8-28 | 3/8-19 | 135-2-6 | | |
| 1/4-19 | 1/4-19 | 4008-4 | B2015-4-4 | E136-4 |
| 1/4-19 | 3/8-19 | 135-4-6 | B2015-4-6 | |
| 1/4-19 | 1/2-14 | 135-4-8 | | |
| 3/8-19 | 1/4-19 | | B2015-6-4 | E135-6-4 |
| 3/8-19 | 3/8-19 | 4008-6 | B2015-6-6 | E136-6 |
| 3/8-19 | 1/2-14 | 135-6-8 | B2015-6-8 | |
| 1/2-14 | 1/4-19 | | B2015-8-4 | E135-8-4 |
| 1/2-14 | 3/8-19 | | B2015-8-6 | E135-8-6 |
| 1/2-14 | 1/2-14 | 4008-8 | B2015-8-8 | E136-8 |
| 1/2-14 | 5/8-14 | 135-8-10 | | |
| 1/2-14 | 3/4-14 | 135-8-12 | B2015-8-12 | |
| 1/2-14 | 1-11 | 135-8-16 | | |
| 5/8-14 | 1/2-14 | | | E135-10-8 |
| 5/8-14 | 5/8-14 | 4008-10 | | E136-10 |
| 5/8-14 | 3/4-14 | 135-10-12 | | |
| 3/4-14 | 1/4-19 | | | E135-12-4 |
| 3/4-14 | 1/2-14 | | B2015-12-8 | E135-12-8 |
| 3/4-14 | 3/4-14 | 4008-12 | B2015-12-12 | E136-12 |
| 3/4-14 | 1-11 | 135-12-16 | | |
| 3/4-14 | 1 1/4-11 | 135-12-20 | | |
| 1-11 | 3/4-14 | | B2015-16-12 | E135-16-12 |
| 1-11 | 1 1/4-11 | 4008-16 | B2015-16-16 | E136-16 |
| 1-11 | 1 1/4-11 | 135-16-20 | | E135-20-16 |
| 1 1/4-11 | 1 1/4-11 | 4008-20 | B2015-20-20 | E136-20 |
| 1 1/4-11 | 1 1/2-11 | 135-20-24 | | E135-24-20 |
| 1 1/2-11 | 1 1/2-11 | 4008-24 | B2015-24-24 | E136-24 |
| 1 1/2-11 | 2-11 | 135-24-32 | | |
| 2-11 | 2-11 | 4008-32 | B2015-32-32 | E136-32 |



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| BSPT | | | | |
|---|---|---|---|---|
| | | BSPT PLUG | BSPT X BSPT ELBOW 45 M X M | BSPT MALE TEE |
| Thread 1 | Thread 2 | Part No. | Part No. | Part No. |
| BSP | BSP | | | |
| 1/8-28 | 1/8-28 | B2082-2 | | B2257-2 |
| 1/4-19 | 1/4-19 | B2082-4 | B2247-4-4 | B2257-4 |
| 3/8-19 | 3/8-19 | B2082-6 | B2247-6-6 | B2257-6 |
| 3/8-19 | 1/2-14 | | | |
| 1/2-14 | 1/2-14 | B2082-8 | B2247-8-8 | B2257-8 |
| 1/2-14 | 3/4-14 | | | |
| 3/4-14 | 1/2-14 | | | |
| 3/4-14 | 3/4-14 | B2082-12 | B2247-12-12 | B2257-12 |
| 1-11 | 1-11 | B2082-16 | B2247-16-16 | B2257-16 |
| 1 1/4-11 | 1 1/4-11 | B2082-20 | | |
| 1 1/2-11 | 1 1/2-11 | B2082-24 | | |
| 2-11 | 2-11 | B2082-32 | | |



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| BSPT | | | | |
|---|---|---|---|---|
| | | BSPTM X BSPF | BSPT REDUCING BUSH | BSPT FEMALE SOCKET |
| Thread 1 | Thread 2 | Part No. | Part No. | Part No. |
| BSP | BSP | | | |
| 1/8-28 | 1/8-28 | | | B2096-2 |
| 1/4-19 | 1/8-28 | | 4813-4-2 | |
| 1/4-19 | 1/4-19 | B2045-4 | | B2096-4 |
| 3/8-19 | 1/8-28 | | 4813-6-2 | |
| 3/8-19 | 1/4-19 | | 4813-6-4 | |
| 3/8-19 | 3/8-19 | B2045-6 | | B2096-6 |
| 1/2-14 | 1/8-28 | | 4813-8-2 | |
| 1/2-14 | 1/4-19 | | 4813-8-4 | |
| 1/2-14 | 3/8-19 | | 4813-8-6 | |
| 1/2-14 | 1/2-14 | B2045-8 | | B2096-8 |
| 3/4-14 | 1/2-14 | | 4813-12-4 | |
| 3/4-14 | 3/8-19 | | 4813-12-6 | |
| 3/4-14 | 1/2-14 | | 4813-12-8 | |
| 3/4-14 | 3/4-14 | B2045-12 | | B2096-12 |
| 1-11 | 3/8-19 | | 4813-16-6 | |
| 1-11 | 1/2-14 | | 4813-16-8 | |
| 1-11 | 3/4-14 | | 4813-16-12 | |
| 1-11 | 1-11 | B2045-16 | | B2096-16 |
| 1 1/4-11 | 3/4-14 | | 4813-20-12 | |
| 1 1/4-11 | 1-11 | | 4813-20-16 | |
| 1 1/4-11 | 1 1/4-11 | B2045-20 | | B2096-20 |
| 1/ 12-11 | 3/4-14 | | 4813-24-12 | |
| 1 1/2-11 | 1-11 | | 4813-24-16 | |
| 1-11 | 1 1/4-11 | | 4813-24-20 | |
| 1 1/4-11 | 1-11 | | 4813-32-16 | |
| 2-11 | 1 1/4-11 | | 4813-32-20 | |
| 2-11 | 1 1/2-11 | | 4813-32-24 | |



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## BSPT

| | | | | |
|---|---|---|---|---|
| | | BSPT X BSPP M X F 45 DEG | BSPT M x F 90 DEG | BSPT X BSPT FEMALE 90 DEG |
| Thread 1 | Thread 2 | | | |
| BSP | BSP | Part No. | Part No. | Part No. |
| 1/8-28 | 1/8-28 | | B2047-2 | |
| 1/4-19 | 1/4-19 | B2049-4 | B2047-4 | B2087-4-4 |
| 3/8-19 | 1/4-19 | | B2047-6-4 | B2087-4-4 |
| 3/8-19 | 3/8-19 | B2049-6 | B2047-6 | B2087-6-6 |
| 1/2-14 | 1/2-14 | B2049-8 | B2047-8 | B2087-8-8 |
| 1/2-14 | 3/4-14 | | | |
| 3/4-14 | 3/4-14 | B2049-12 | B2047-12 | B2087-12-12 |
| 1-11 | 1-11 | B2049-16-16 | B2047-16 | B2087-16-16 |
| 1 1/4-11 | 1 1/4-11 | | B2047-20 | B2087-20-20 |
| 1 1/2-11 | 1 1/2-11 | | | B2087-24-24 |
| 2-11 | 2-11 | | | B2087-32-32 |

## BSPT

| | | | | |
|---|---|---|---|---|
| | | BSPT X BSPT M X F 90 | BSPT MALE 90 DEG | BSPT FEMALE T |
| Thread 1 | Thread 2 | Part No. | Part No. | Part No. |
| BSP | BSP | | | |
| 1/8-28 | 1/8-28 | B2089-2-2 | 4012-2 | B2090-2 |
| 1/4-19 | 1/4-19 | B2089-4-4 | 4012-4 | B2090-4 |
| 3/8-19 | 1/4-19 | | 4012-6-4 | |
| 3/8-19 | 3/8-19 | B2089-6-6 | 4012-6 | B2090-6 |
| 1/2-14 | 3/8-19 | | 4012-8-6 | |
| 1/2-14 | 1/2-14 | B2089-8-8 | 4012-8 | B2090-8 |
| 3/4-14 | 1/2-14 | | 4012-12-8 | |
| 3/4-14 | 3/4-14 | B2089-12-12 | 4012-12 | B2090-12 |
| 1-11 | 3/4-14 | | 4012-16-12 | |
| 1-11 | 1-11 | B2089-16-16 | 4012-16 | B2090-16 |
| 1 1/4-11 | 1 1/4-11 | | 4012-20-20 | B2090-20 |



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| BSPP | | T1 T2 | T1 | |
|---|---|---|---|---|
| | | BSPP M X F | BSPP PLUG | |
| Thread 1 | Thread 2 | Part No | Part No | |
| BSPP | BSPP | | | |
| 1/4-19 | 1/4-19 | B2046-4-4 | B2086-4 | |
| 3/8-19 | 1/4-19 | | | |
| 3/8-19 | 3/8-19 | B2046-6-6 | B2086-6 | |
| 1/2-14 | 1/4-19 | | | |
| 1/2-14 | 3/8-19 | | | |
| 1/2-14 | 1/2-14 | B2046-8-8 | B2086-8 | |
| 3/4-14 | 3/8-19 | | | |
| 3/4-14 | 1/2-14 | | | |
| 3/4-14 | 3/4-14 | B2046-12-12 | B2086-12 | |
| 1-11 | 1/2-14 | | | |
| 1-11 | 3/4-14 | | | |
| 1-11 | 1-11 | B2046-16-16 | B2086-16 | |
| 1 1/4-11 | 1-11 | | | |
| 1 1/4-11 | 1 1/4-11 | B2046-20-20 | B2086-20 | |
| 1 1/2-11 | 1 1/4-11 | | | |
| 1 1/2-11 | 1 1/2-11 | B2046-24-24 | B2086-24 | |
| 2-11 | 2-11 | | B2086-32 | |



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| BSPP | | T1 | T1 | T1 |
|---|---|---|---|---|
| | | BSPP MALE B'HEAD | BSP M X F X M TEE | BSPP CAP |
| Thread 1 | Thread 2 | Part No | Part No | Part No |
| BSPP | BSPP | | | |
| 1/4-19 | 1/4-19 | D274-0404 | B2093-4-4 | B210292-4 |
| 3/8-19 | 1/4-19 | | | |
| 3/8-19 | 3/8-19 | D274-0606 | B2093-6-6 | B210292-6 |
| 1/2-14 | 1/4-19 | | | |
| 1/2-14 | 3/8-19 | | | |
| 1/2-14 | 1/2-14 | D274-0808 | B2093-8-8 | B210292-8 |
| 3/4-14 | 3/8-19 | | | |
| 3/4-14 | 1/2-14 | | | |
| 3/4-14 | 3/4-14 | D274-1212 | B2093-12-12 | B210292-12 |
| 1-11 | 1/2-14 | | | |
| 1-11 | 3/4-14 | | | |
| 1-11 | 1-11 | D274-1616 | B2093-16-16 | B210292-16 |
| 1 1/4-11 | 1-11 | | | |
| 1 1/4-11 | 1 1/4-11 | D274-2020 | | B210292-20 |
| 1 1/2-11 | 1 1/4-11 | | | |
| 1 1/2-11 | 1 1/2-11 | | | B210292-24 |
| 2-11 | 2-11 | | | |



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# BSPT / JIC

| Thread 1 | Thread 2 | BSPT X JIC M X M | BSPT X JIC F X M 45 DEG | BSPT X JIC F X M |
|---|---|---|---|---|
| BSPT | JIC | Part No. | Part No. | Part No. |
| 1/8-28 | 7/16-20 | 4009-2-4 | | 6720-2-4 |
| 1/8-28 | 1/2-20 | 4009-2-5 | | 6720-2-5 |
| 1/8-28 | 9/16-18 | 4009-2-6 | | 6720-2-6 |
| 1/4-19 | 7/16-20 | 4009-4-4 | GG210-NP04-04 | 6720-4-4 |
| 3/8-19 | 1/2-20 | 4009-4-5 | | 6720-4-5 |
| 1/4-19 | 9/16-18 | 4009-4-6 | | 6720-4-6 |
| 1/4-19 | 3/4-16 | 4009-4-8 | | 6720-4-8 |
| 3/8-19 | 7/16-20 | 4009-6-4 | | 6720-6-4 |
| 3/8-19 | 1/2-20 | 4009-6-5 | | 6720-6-5 |
| 3/8-19 | 9/16-18 | 4009-6-6 | GG210-NP06-06 | 6720-6-6 |
| 3/8-19 | 3/4-16 | 4009-6-8 | | 6720-6-8 |
| 3/8-19 | 7/8-14 | 4009-6-10 | | 6720-6-10 |
| 3/8-19 | 1 1/6-12 | 4009-6-12 | | |
| 1/2-14 | 7/16-20 | 4009-8-4 | | |
| 1/2-14 | 9/16-18 | 4009-8-6 | | |
| 1/2-14 | 3/4-16 | 4009-8-8 | GG210-NP08-08 | 6720-8-8 |
| 1/2-14 | 7/8-14 | 4009-8-10 | | 6720-8-10 |
| 1/2-14 | 1 1/6-12 | 4009-8-12 | | 6720-8-12 |
| 3/4-14 | 9/16-18 | 4009-12-6 | | |
| 3/4-14 | 3/4-16 | 4009-12-8 | | 6720-12-8 |
| 3/4-14 | 7/8-14 | 4009-12-10 | | 6720-12-10 |
| 3/4-14 | 1 1/16-12 | 4009-12-12 | GG210-NP12-12 | 6720-12-12 |
| 3/4-14 | 1 3/16-12 | 4009-12-14 | | |
| 3/4-14 | 1 5/16-12 | 4009-12-16 | | 6720-12-16 |
| 1-11 | 3/4-16 | 4009-16-8 | | |
| 1-11 | 1 1/16-12 | 4009-16-12 | | 6720-16-12 |
| 1-11 | 1 3/16-12 | 4009-16-14 | | |
| 1-11 | 1 5/16-12 | 4009-16-16 | GG210-NP16-16 | 6720-16-16 |
| 1-11 | 1 5/8-12 | 4009-16-20 | | 6720-16-20 |
| 1 1/4-11 | 1 5/16-12 | 4009-20-16 | | |
| 1 1/4-11 | 1 5/8-12 | 4009-20-20 | | 6720-20-20 |
| 1 1/4-11 | 1 7/8-12 | 4009-20-24 | | |
| 1 1/2-11 | 1 7/8-12 | 4009-24-24 | | |
| 1 1/2-11 | 1 5/8-12 | 4009-24-20 | | |
| 2-11 | 2 1/2-12 | 4009-32-32 | | |



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| BSPT / JIC | | | BSPP / JIC | |
|---|---|---|---|---|
| | | | | |
| | | BSPT X JICF | BSPP X JIC M X M | BSPP X JIC MALE ENCAPTULATED SEAL |
| Thread 1 | Thread 2 | | | |
| JIC | BSPP | Part No | Part No | Part No |
| 7/16-20 | 1/8-28 | | GG106-NP04-02 | |
| 7/16-20 | 1/4-19 | B2250-4-4 | GG106-NP04-04 | D226-0407 |
| 7/16-20 | 3/8-19 | | GG106-NP04-06 | D226-0409 |
| 9/16-18 | 1/4-19 | B2250-4-6 | GG106-NP06-04 | |
| 9/16-18 | 3/8-19 | B2250-6-6 | GG106-NP06-06 | |
| 9/16-18 | 1/2-14 | | GG106-NP06-08 | D226-0809 |
| 3/4-16 | 3/8-19 | B2250-6-8 | GG106-NP08-06 | |
| 7/8-14 | 3/8-19 | | GG106-NP10-06 | |
| 3/4-16 | 1/2-14 | | GG106-NP08-08 | D226-0812 |
| 7/8-14 | 1/2-14 | B2250-8-10 | GG106-NP10-08 | D226-0814 |
| 1 1/16-12 | 1/2-14 | B2250-8-12 | GG106-NP12-08 | D226-0817 |
| 3/4-16 | 3/4-14 | | GG106-NP08-12 | |
| 7/8-14 | 3/4-14 | | GG106-NP10-12 | |
| 1 1/16-12 | 3/4-14 | B2250-12-12 | GG106-NP12-12 | D226-1217 |
| 1 1/16-12 | 1-11 | | GG106-NP12-16 | D226-1617 |
| 1 5/16-12 | 3/4-14 | | GG106-NP16-12 | |
| 1 1/16-12 | 1 1/4-11 | | GG106-NP12-20 | |
| 1 5/16-12 | 1-11 | B2250-16-16 | GG106-NP16-16 | D226-1621 |
| 1 5/16-12 | 1 1/4-11 | | GG106-NP16-20 | |
| 1 5/8-12 | 1-11 | | GG106-NP20-16 | |
| 1 5/8-12 | 1 1/4-11 | B2250-20-20 | GG106-NP20-20 | D226-2026 |
| 1 5/8-12 | 1 1/2-11 | | GG106-NP20-24 | |
| 1 7/8-12 | 1 1/4-11 | | GG106-NP24-20 | |
| 1 7/8-12 | 1 1/2-11 | | GG106-NP24-24 | |
| 2 1/2-12 | 2-11 | | GG106-NP32-32 | |



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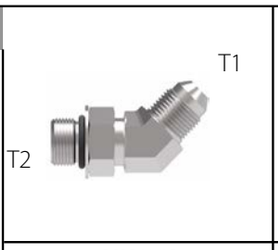
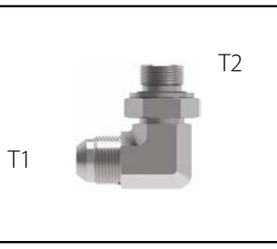
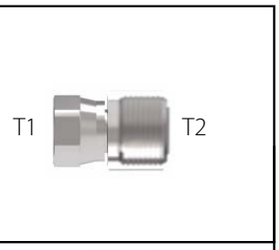
# BSPP / JIC

| | |  |  |  |
|---|---|---|---|---|
| | | BSPP X JIC | BSPP X JIC | BSPP X JIC |
| Thread 1 | Thread 2 | M X M 45 | M X M 90 | M X F |
| JIC / UNO | BSPP | Part No | Part No. | Part No. |
| 7/16-20 | 1/8-28 | | GG306-NP04-02 | |
| 7/16-20 | 1/4-19 | GG206-NP04-04 | GG306-NP04-04 | DA226-0407 |
| 7/16-20 | 3/8-19 | | GG306-NP04-06 | |
| 9/16-18 | 1/4-19 | | GG306-NP06-04 | DA226-0409 |
| 9/16-18 | 3/8-19 | GG206-NP06-06 | GG306-NP06-06 | DA226-0609 |
| 9/16-18 | 1/2-14 | | GG306-NP06-08 | |
| 3/4-16 | 3/8-19 | | GG306-NP08-06 | DA226-0612 |
| 7/8-14 | 3/8-19 | | GG306-NP10-06 | |
| 3/4-16 | 1/2-14 | GG206-NP08-08 | GG306-NP08-08 | DA226-0812 |
| 7/8-14 | 1/2-14 | | GG306-NP10-08 | DA226-0814 |
| 1 1/16-12 | 1/2-14 | | GG306-NP12-08 | |
| 3/4-16 | 3/4-14 | | GG306-NP08-12 | |
| 7/8-14 | 3/4-14 | | GG306-NP10-12 | |
| 1 1/16-12 | 3/4-14 | GG206-NP12-12 | GG306-NP12-12 | DA226-1217 |
| 1 1/16-12 | 1-11 | | GG306-NP12-16 | DA226-1617 |
| 1 5/16-12 | 3/4-14 | | GG306-NP16-12 | |
| 1 1/16-12 | 1 1/4-11 | | GG306-NP12-20 | |
| 1 5/16-12 | 1-11 | GG206-NP16-16 | GG306-NP16-16 | DA226-1621 |
| 1 5/16-12 | 1 1/4-11 | | | |
| 1 5/8-12 | 1-11 | | GG306-NP20-16 | |
| 1 5/8-12 | 1 1/4-11 | GG206-NP20-20 | GG306-NP20-20 | DA226-2026 |
| 1 5/8-12 | 1 1/2-11 | | GG306-NP20-24 | |
| 1 7/8-12 | 1 1/4-11 | | GG306-NP24-20 | |
| 1 7/8-12 | 1 1/2-11 | | GG306-NP24-24 | |
| 2 1/2-12 | 2-11 | | | |



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| BSPT / UNO | | | BSPP / UNO | |
|---|---|---|---|---|
| | | UNO X BSPT | BSPP X UNO | UNO X BSPP |
| Thread 1 | Thread 2 | M X M | M X M | M X M |
| UNO | BSPT / BSPP | | Part No. | Part No. |
| 7/16-20 | 1/8-28 | | | |
| 7/16-20 | 1/4-19 | | B6831-4-4S | B2032-4-4S |
| 9/16-18 | 1/4-19 | | B6831-4-6S | B2032-6-4S |
| 7/16-20 | 1/2-14 | | | |
| 7/16-20 | 3/8-19 | | B6831-6-4S | B2032-4-6S |
| 9/16-18 | 3/8-19 | | B6831-6-6S | B2032-6-6S |
| 3/4-16 | 3/8-19 | | B6831-6-8S | |
| 9/16-18 | 1/2-14 | | B6831-8-6S | B2032-6-8S |
| 3/4-16 | 3/8-19 | 6821-8-6 | | |
| 7/8-14 | 3/8-19 | | | |
| 3/4-16 | 1/2-14 | 6821-8-8 | B6831-8-8S | B2032-8-8S |
| 7/8-14 | 1/2-14 | 6821-10-8 | | |
| 3/4-16 | 3/4-14 | | B6831-12-8S | B2032-8-12S |
| 7/8-14 | 3/4-14 | 6821-10-12 | | |
| 1 1/16-12 | 1/2-14 | 6821-12-8 | | |
| 1 1/16-12 | 3/4-14 | 6821-12-12 | B6831-12-12S | B2032-12-12S |
| 1 5/16-12 | 1-11 | 6821-16-16 | B6831-16-16S | |



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## UNO' X JIC

| Thread 1 | Thread 2 | UNO' X JIC | UNO' X JIC M X M 45 | UNO' X JIC M X M 90 |
|---|---|---|---|---|
| UNO | JIC | Part No | Part No | Part No |
| 7/16-20 | 7/16-20 | 202702-4-4S | 2061-4-4S | 2062-4-4S |
| 7/16-20 | 9/16-18 | 202702-4-6S | | 2062-4-6S |
| 7/16-20 | 3/4-16 | 202702-4-8S | | |
| 1/2-20 | 7/16-20 | 202702-5-4S | | |
| 1/2-20 | 1/2-20 | 202702-5-5S | | 2062-5-5S |
| 1/2-20 | 9/16-18 | 202702-5-6S | | |
| 9/16-18 | 7/16-20 | 202702-6-4S | | 2062-6-4S |
| 9/16-18 | 9/16-18 | 202702-6-6S | 2061-6-6S | 2062-6-6S |
| 9/16-18 | 3/4-16 | 202702-6-8S | | 2062-6-8S |
| 9/16-18 | 7/8-14 | 202702-6-10S | | |
| 3/4-16 | 7/16-20 | 202702-8-4S | | |
| 3/4-16 | 9/16-18 | 202702-8-6S | | 2062-8-6S |
| 3/4-16 | 3/4-16 | 202702-8-8S | 2061-8-8S | 2062-8-8S |
| 3/4-16 | 7/8-14 | 202702-8-10S | 2061-8-10S | 2062-8-10S |
| 3/4-16 | 1 1/16-12 | 202702-8-12S | | |
| 7/8-14 | 9/16-18 | 202702-10-6S | | 2062-10-6S |
| 7/8-14 | 3/4-16 | 202702-10-8S | 2061-10-8S | 2062-10-8S |
| 7/8-14 | 7/8-14 | 202702-10-10S | 2061-10-10S | 2062-10-10S |
| 7/8-14 | 1 1/16-12 | 202702-10-12S | | 2062-10-12S |
| 7/8-14 | 1 5/16-12 | 202702-10-16S | | |
| 1 1/16-12 | 3/4-16 | 202702-12-8S | | 2062-12-8S |
| 1 1/16-12 | 7/8-14 | 202702-12-10S | | 2062-12-10S |
| 1 1/16-12 | 1 1/16-12 | 202702-12-12S | 2061-12-12S | 2062-12-12S |
| 1 1/16-12 | 1 5/16-12 | 202702-12-16S | | 2062-12-16S |
| 1 5/16-12 | 3/4-16 | 202702-16-8S | | |
| 1 5/16-12 | 7/8-14 | 202702-16-10S | | |
| 1 5/16-12 | 1 1/16-12 | 202702-16-12S | 2061-16-12S | 2062-16-12S |
| 1 5/16-12 | 1 5/16-12 | 202702-16-16S | 2061-16-16S | 2062-16-16S |
| 1 5/16-12 | 1 5/8-12 | 202702-16-20S | | 2062-16-20S |
| 1 5/8-12 | 1 1/16-12 | 202702-20-12S | 2061-20-12S | |
| 1 5/8-12 | 1 5/16-12 | 202702-20-16S | 2061-20-16S | 2062-20-16S |
| 1 5/8-12 | 1 5/8-12 | 202702-20-20S | 2061-20-20S | 2062-20-20S |
| 1 7/8-12 | 1 5/16-12 | 202702-24-16S | | |
| 1 7/8-12 | 1 5/8-12 | 202702-24-20S | | |
| 1 7/8-12 | 1 7/8-12 | 202702-24-24S | | 2062-24-24S |



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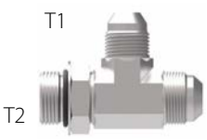
## UNO' X JIC

| Thread 1 | Thread 2 | UNO' X JIC M X F | UNO' PLUG | UNO' X JIC TEE M X M X M |
|---|---|---|---|---|
| UNO | JIC | Part No | Part No | Part No |
| 7/16-20 | 7/16-20 | 2266-4-4S | 900598-4S | 203003-4-4S |
| 1/2-20 | 1/2-20 | | 900598-5S | 203003-5-5S |
| 9/16-18 | 7/16-20 | | | 203003-6-4S |
| 9/16-18 | 9/16-18 | 2266-6-6S | 900598-6S | 203003-6-6S |
| 9/16-18 | 3/4-16 | 2266-6-8S | | |
| 3/4-16 | 3/4-16 | 2266-8-8S | 900598-8S | 203003-8-8S |
| 3/4-16 | 7/8-14 | | | 203003-8-10S |
| 7/8-14 | 7/8-14 | 2266-10-10S | 900598-10S | 203003-10-10S |
| 1 1/16-12 | 1 1/16-12 | 2266-12-12S | 900598-12S | 203003-12-12S |
| 1 5/16-12 | 1 5/16-12 | 2266-16-16S | 900598-16S | |
| 1 5/8-12 | 1 5/8-12 | | 900598-20S | |
| 1 7/8-12 | 1 7/8-12 | | 900598-24S | |
| 2 1/2-12 | 2 1/2-12 | | | |

## UNO' X JIC




| Thread 1 | Thread 2 | UNO' X JIC MALE TEE |
|---|---|---|
| UNO | JIC | Part No |
| 7/16-20 | 7/16-20 | 203005-4-4S |
| 1/2-20 | 1/2-20 | |
| 9/16-18 | 7/16-20 | |
| 9/16-18 | 9/16-18 | 203005-6-6S |
| 3/4-16 | 3/4-16 | 203005-8-8S |
| 7/8-14 | 3/4-16 | |
| 7/8-14 | 7/8-14 | 203005-10-10S |
| 1 1/16-12 | 1 1/16-12 | 203005-12-12S |
| 1 5/16-12 | 1 5/16-12 | 203005-16-16S |
| 1 5/8-12 | 1 5/8-12 | |



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## JIC X JIC

| | | | | |
|---|---|---|---|---|
| | | JIC X JIC | JIC X JIC | JIC X JIC |
| Thread 1 | Thread 2 | P/No | BULKHEAD | BULKHEAD 45 |
| JIC | JIC | Part No. | Part No. | Part No. |
| 7/16-20 | 7/16-20 | 2027-4-4S | 2041-4-4S | |
| 1/2-20 | 7/16-20 | 2027-5-4S | | |
| 1/2-20 | 1/2-20 | 2027-5-5S | 2041-5-5S | |
| 9/16-18 | 7/16-20 | 2027-6-4S | | |
| 9/16-18 | 1/2-20 | 2027-6-5S | | |
| 9/16-18 | 9/16-18 | 2027-6-6S | 2041-6-6S | 2042-6-6S |
| 3/4-16 | 9/16-18 | 2027-8-6S | | |
| 3/4-16 | 3/4-16 | 2027-8-8S | 2041-8-8S | 2042-8-8S |
| 7/8-14 | 3/4-16 | 2027-10-8S | | |
| 7/8-14 | 7/8-14 | 2027-10-10S | 2041-10-10S | 2042-10-10S |
| 1 1/16-12 | 7/8-14 | 2027-12-10S | | |
| 1 1/16-12 | 1 1/16-12 | 2027-12-12S | 2041-12-12S | 2042-12-12S |
| 1 1/16-12 | 3/4-16 | 2027-12-8S | | |
| 1 5/16-12 | 1 1/16-12 | 2027-16-12S | | |
| 1 5/16-12 | 1 5/16-12 | 2027-16-16S | 2041-16-16S | 2042-16-16S |
| 1 5/8-12 | 1 5/8-12 | 2027-20-20S | 2041-20-20S | |
| 1 7/8-12 | 1 7/8-12 | 2027-24-24S | 2041-24-24S | |

## JIC X JIC

| | | | | |
|---|---|---|---|---|
| | | JIC X JIC | JIC X JIC | JIC |
| Thread 1 | Thread 2 | M X M 90 | BLKHEAD 90 | MALE TEE |
| JIC | JIC | Part No. | Part No. | Part No. |
| 7/16-20 | 7/16-20 | 2039-4-4S | 2043-4-4S | 2033-4-4S |
| 1/2-20 | 1/2-20 | 2039-5-5S | | 2033-5-5S |
| 9/16-18 | 9/16-18 | 2039-6-6S | 2043-6-6S | 2033-6-6S |
| 3/4-16 | 9/16-18 | 2039-8-6S | | |
| 3/4-16 | 3/4-16 | 2039-8-8S | 2043-8-8S | 2033-8-8S |
| 7/8-14 | 3/4-16 | 2039-10-8S | | 2033-10-8S |
| 7/8-14 | 7/8-14 | 2039-10-10S | 2043-10-10S | 2033-10-10S |
| 1 1/16-12 | 1 1/16-12 | 2039-12-12S | 2043-12-12S | 2033-12-12S |
| 1 5/16-12 | 1 1/16-12 | 2039-16-16S | 2043-16-16S | 2033-16-16S |
| 1 5/16-12 | 1 5/16-12 | 2039-20-20S | 2043-20-20S | 2033-20-20S |



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## JIC X JIC

| Thread 1 | Thread 2 | JICF X JICM | JICF X JICM | JICF X JIC M 45 DEG |
|---|---|---|---|---|
| JIC | JIC | Part No. | Part No | Part No |
| 7/16-20 | 7/16-20 | | | 2070-4-4S |
| 1/2-20 | 1/2-20 | | | 2070-5-5S |
| 9/16-18 | 7/16-20 | 221501-6-4S | 2215-4-6S | |
| 9/16-18 | 9/16-18 | | | 2070-6-6S |
| 3/4-16 | 7/16-20 | 221501-8-4S | | |
| 3/4-16 | 9/16-18 | 221501-8-6S | | |
| 3/4-16 | 3/4-16 | | | 2070-8-8S |
| 7/8-14 | 9/16-18 | 221501-10-6S | | |
| 7/8-14 | 3/4-16 | 221501-10-8S | 2215-10-8S | |
| 7/8-14 | 7/8-14 | | | 2070-10-10S |
| 7/8-14 | 1 1/16-12 | | 2215-10-12S | |
| 1 1/16-12 | 7/16-20 | 221501-12-4S | | |
| 1 1/16-12 | 9/16-18 | 221501-12-6S | | |
| 1 1/16-12 | 3/4-16 | 221501-12-8S | | |
| 1 1/16-12 | 7/8-14 | 221501-12-10S | 2215-12-10S | |
| 1 1/16-12 | 1 1/16-12 | | | 2070-12-12S |
| 1 1/16-12 | 1 5/16-12 | | 2215-12-16S | |
| 1 5/16-12 | 9/16-18 | 221501-16-6S | | |
| 1 5/16-12 | 3/4-16 | 221501-16-8S | | |
| 1 5/16-12 | 1 1/16-12 | 221501-16-12S | | |
| 1 5/16-12 | 1 5/16-12 | | | 2070-16-16S |
| 1 5/16-12 | 1 5/8-12 | | 2215-16-20S | |
| 1 5/8-12 | 1 5/16-12 | 221501-20-16S | | |
| 1 5/8-12 | 1 5/8-12 | | | 2070-20-20S |
| 1 7/8-12 | 1 5/8-12 | | 2215-24-20S | |
| 1 7/8-12 | 1 7/8-12 | | | 2070-24-24S |
| 2 1/2-12 | 2 1/2-12 | | | 2070-32-32S |



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## JIC X JIC

| | | T1 | T1 | T1 |
|---|---|---|---|---|
| | | JIC X JIC | JIC X JIC | JIC X JIC |
| Thread 1 | Thread 2 | F X M 90 | F X M 90 | F X M 90 LONG |
| JIC | JIC | Part No | Part No. | Part No. |
| 7/16-20 | 7/16-20 | 2071-4-4S | | |
| 1/2-20 | 1/2-20 | 2071-5-5S | | |
| 9/16-18 | 9/16-18 | 2071-6-6S | | |
| 3/4-16 | 3/4-16 | 2071-8-8S | FF5163-0808S | FF5164-0808S |
| 7/8-14 | 7/8-14 | 2071-10-10S | | |
| 7/8-14 | 1 1/16-12 | | | |
| 1 1/16-12 | 1 1/16-12 | 2071-12-12S | FF5163-1212S | FF5164-1212S |
| 1 5/16-12 | 1 1/16-12 | | | |
| 1 5/16-12 | 1 5/16-12 | 2071-16-16S | FF5163-1616S | FF5164-1616S |
| 1 5/8-12 | 1 5/8-12 | 2071-20-20S | FF5163-2020S | FF5164-2020S |
| 1 7/8-12 | 1 7/8-12 | 2071-24-24S | FF5163-2424S | |

## JIC X JIC

| | | T1 | T1 | T1 |
|---|---|---|---|---|
| | | JIC X JIC | JIC X JIC | JIC TEE |
| Thread 1 | Thread 2 | F X M 90 | F X M 90 LONG | M X M X F |
| JIC | JIC | Part No | Part No | Part No |
| 7/16-20 | 7/16-20 | 500454-4S | 504095-4S | 203101-4-4S |
| 1/2-20 | 1/2-20 | 500454-5S | 504095-5S | 203101-5-5S |
| 9/16-18 | 9/16-18 | 500454-6S | 504095-6S | 203101-6-6S |
| 3/4-16 | 3/4-16 | 500454-8S | 504095-8S | 203101-8-8S |
| 7/8-14 | 7/8-14 | 500454-10S | 504095-10S | 203101-10-10S |
| 1 1/16-12 | 1 1/16-12 | 500454-12S | 504095-12S | 203101-12-12S |
| 1 5/16-12 | 1 5/16-12 | 500454-16S | 504095-16S | 203101-16-16S |
| 1 5/8-12 | 1 5/8-12 | 500454-20S | 504905-20S | 203101-20-20S |



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## JIC X JIC

| Thread 1 | Thread 2 | JIC TEE M X F X M | JIC PLUG | JIC CAP |
|---|---|---|---|---|
| JIC | JIC | Part No | Part No | Part No |
| 3/8-24 | 3/8-24 | | 900599-3S | 210292-3S |
| 7/16-20 | 7/16-20 | 203102-4-4S | 900599-4S | 210292-4S |
| 1/2-20 | 1/2-20 | 203102-5-5S | 900599-5S | 210292-5S |
| 9/16-18 | 9/16-18 | 203102-6-6S | 900599-6S | 210292-6S |
| 3/4-16 | 3/4-16 | 203102-8-8S | 900599-8S | 210292-8S |
| 7/8-14 | 7/8-14 | 203102-10-10S | 900599-10S | 210292-10S |
| 1 1/16-12 | 1 1/16-12 | 203102-12-12S | 900599-12S | 210292-12S |
| 1 5/16-12 | 1 5/16-12 | 203102-16-16S | 900599-16S | 210292-16S |
| 1 5/8-12 | 1 5/8-12 | 203102-20-20S | 900599-20S | 210292-20S |
| 1 7/8-12 | 1 7/8-12 | 203102-24-24S | 900599-24S | 210292-24S |
| 2 1/2-12 | 2 1/2-12 | | 900599-32S | 210292-32S |

## JIC X JIC

| Thread 1 | Tube | JIC MALE TUBEWELD | JIC FEMALE TUBEWELD |
|---|---|---|---|
| JIC | OD | Part No. | Part No. |
| 7/16-20 | 1/4" | 73014-4S | |
| 9/16-18 | 3/8" | 73014-6S | TW25-0906 |
| 9/16-18 | 1/2" | | TW25-0908 |
| 3/4-16 | 3/8" | | TW25-1206 |
| 3/4-16 | 1/2" | 73014-8S | TW25-1208 |
| 3/4-16 | 5/8" | | TW25-1210 |
| 7/8-14 | 1/2" | | TW25-1408 |
| 7/8-14 | 5/8" | 73014-10S | TW25-1410 |
| 7/8-14 | 3/4" | | TW25-1412 |
| 7/8-14 | 7/8" | | TW25-1414 |
| 1 1/16-12 | 3/4" | 73014-12S | TW25-1712 |
| 1 1/16-12 | 7/8" | | TW25-1714 |
| 1 1/16-12 | 1" | | TW25-1716 |
| 1 5/16-12 | 1" | 73014-16S | TW25-2116 |
| 1 5/16-12 | 1 1/8" | | TW25-2118 |
| 1 5/8-12 | 1 1/4" | | TW25-2120 |
| 1 5/8-12 | 1 1/4" | 73014-20S | TW25-2620 |
| 1 5/8-12 | 1 1/4" | | TW25-2620 |
| 1 7/8-12 | 1 1/2" | | TW25-2624 |
| 1 7/8-12 | 1 1/2" | 73014-24S | TW25-3024 |
| 2 1/2-12 | 2" | 73014-32S | TW25-4032 |



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## JIC TUBE NUTS

| | | T1 | T1 |
|---|---|---|---|
| | | JIC FEMALE TUBE NUT | JIC FEMALE TUBE NUT |
| Thread 1 | | FLARE TYPE | FLARELESS TYPE |
| JIC | | Part No. | Part No. |
| 7/16-20 | | 1290-4S | FC2875-04S |
| 1/2-20 | | 1290-5S | FC2875-05S |
| 9/16-18 | | 1290-6S | FC2875-06S |
| 3/4-16 | | 1290-8S | FC2875-08S |
| 7/8-14 | | 1290-10S | FC2875-10S |
| 1 1/16-12 | | 1290-12S | FC2875-12S |
| 1 3/16-12 | | 1290-14S | |
| 1 5/16-12 | | 1290-16S | FC2875-16S |
| 1 5/8-12 | | 1290-20S | FC2875-20S |
| 1 7/8-12 | | 1290-24S | FC2875-24S |
| 2 1/2-12 | | | |

## TUBE SLEEVES

| | | | |
|---|---|---|---|
| | | TUBE SLEEVE | TUBE SLEEVE |
| Tube | | FLARE TYPE | FLARELESS TYPE |
| OD | | Part No. | Part No. |
| 1/4" | | 900605-4S | FF9605-04S |
| 3/8" | | 900605-6S | FF9605-06S |
| 1/2" | | 900605-8S | FF9605-08S |
| 5/8" | | 900605-10S | FF9605-10S |
| 3/4" | | 900605-12S | FF9605-12S |
| 7/8" | | 900605-14S | |
| 1" | | 900605-16S | FF9605-16S |
| 1 1/4" | | 900605-20S | FF9605-20S |
| 1 1/2" | | 900605-24S | FF9605-24S |



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## JIC X C61 Flange

| | | | | |
|---|---|---|---|---|
| | | JIC X CD61 FLANGE | JIC X CD61 FLANGE 45 | JIC X CD61 FLANGE 90 |
| Flange | Thread 2 | | | |
| Inch | JIC | Part No | Part No. | Part No. |
| 1/2 | 3/4-16 | 500025-8S | 500023-8S | 500024-8S |
| 3/4 | 1 1/16-12 | 500025-12S | 500023-12S | 500024-12S |
| 3/4 | 3/4-16 | 500025-12-8S | 500023-12-8S | 500024-12-8S |
| 3/4 | 7/8-14 | | | 500024-12-10S |
| 1 | 1 5/16-12 | 500025-16S | 500023-16S | 500024-16S |
| 1 | 7/8-14 | 500025-16-10S | 500023-16-10S | 500024-16-10S |
| 1 | 1 1/16-12 | 500025-16-12S | 500023-16-12S | 500024-16-12S |
| 1/1/4 | 1 5/8-12 | 500025-20S | 500023-20S | 500024-20S |
| 1/1/4 | 1 1/16-12 | | 500023-20-12S | 500024-20-12S |
| 1/1/4 | 1 5/16-12 | 500025-20-16S | 500023-20-16S | 500024-20-16S |
| 1/1/4 | 1 7/8-12 | 500025-20-24S | | 500024-20-24S |
| 1 1/2 | 1 7/8-12 | 500025-24S | 500023-24S | 500024-24S |
| 1 1/2 | 1 5/16-12 | 500025-24-16S | 500023-24-16S | 500024-24-16S |
| 1 1/2 | 1 5/8-12 | 500025-24-20S | 500023-24-20S | 500024-24-20S |
| 1 1/2 | 2 1/2-12 | | 500023-24-32S | 500024-24-32S |
| 2 | 2 1/2-12 | 500025-32S | 500023-32S | 500024-32S |
| 2 | 1 5/16-12 | 500025-32-16S | | |
| 2 | 1 5/8-12 | 500025-32-20S | | 500024-32-20S |
| 2 | 1 7/8-12 | 500025-32-24S | | 500024-32-24S |
| 2 1/2 | 1 5/8-12 | | | 500024-40-20S |
| 2 1/2 | 1 7/8 | | 500023-40-24S | 500024-40-24S |
| 2 1/2 | 2 1/2 | | | 500024-40-32S |
| 2 1/2 | 3 | | 500023-40S | 500024-40-40S |



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## JIC X C62 Flange

JIC X CD62 FLANGE

JIC X CD61 FLANGE 45

JIC X CD61 FLANGE 90

| Flange | Thread 2 | | | |
|---|---|---|---|---|
| Inch | JIC | Part No | Part No. | Part No. |
| 3/4 | 1 1/16-12 | FF5541-1212S | FF5539-1212S | FF5540-1212S |
| 1 | 1 1/16-12 | | FF5539-1612S | FF5540-1612S |
| 1 | 1 5/16-12 | FF5541-1616S | FF5539-1616S | FF5540-1616S |
| 1/1/4 | 1 1/16-12 | | | FF5540-2016S |
| 1/1/4 | 1 5/8-12 | FF5541-2020S | FF5539-2020S | FF5540-2020S |
| 1/1/4 | 1 5/16-12 | FF5541-2016S | | |
| 1/1/4 | 1 7/8-12 | | | |
| 1 1/2 | 1 7/8-12 | FF5541-2424S | FF5539-2424S | FF5540-2424S |
| 1 1/2 | 1 5/16-12 | FF5541-2416S | FF5539-2416S | FF5540-2416S |
| 1 1/2 | 1 5/8-12 | FF5541-2420S | FF5539-2420S | FF5540-2420S |

## NPT X NPT

NPT X NPT
M X M

NPT X NPT
M X M 90

NPT
MALE TEE

| Thread 1 | Thread 2 | | | |
|---|---|---|---|---|
| NPT | NPT | Part No | Part No | Part No |
| 1/8-27 | 1/8-27 | 2083-2-2S | 2085-2-2S | 2257-2-2S |
| 1/4-18 | 1/8-27 | 2083-4-2S | | |
| 1/4-18 | 1/4-18 | 2083-4-4S | 2085-4-4S | 2257-4-4S |
| 3/8-18 | 1/4-18 | 2083-6-4S | 2085-6-4S | |
| 3/8-18 | 3/8-18 | 2083-6-6S | 2085-6-6S | 2257-6-6S |
| 1/2-14 | 3/8-18 | 2083-8-6S | 2085-8-6S | |
| 1/2-14 | 1/2-14 | 2083-8-8S | 2085-8-8S | 2257-8-8S |
| 3/4-14 | 1/2-14 | 2083-12-8S | 2085-12-8S | |
| 3/4-14 | 3/4-14 | 2083-12-12S | 2085-12-12S | 2257-12-12S |
| 1-11 1/2 | 3/4-14 | 2083-16-12S | 2085-16-12S | |
| 1-11 1/2 | 1-11 1/2 | 2083-16-16S | 2085-16-16S | 2257-16-16S |
| 1 1/4-11 1/2 | 1-11 1/2 | 2083-20-16S | | |
| 1 1/4-11 1/2 | 1 1/4-11 1/2 | 2083-20-20S | | |
| 1 1/2-11 1/2 | 1 1/2-11 1/2 | 2083-24-24S | | |
| 2-11 1/2 | 2-11 1/2 | 2083-32-32S | | |



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| NPT X NPT | | T1 T2 | T1 T2 | T1 T2 |
|---|---|---|---|---|
| | | NPT X NPT<br>F X M BUSH | NPSM X NPT<br>F X M | NPSM X NPT<br>F X M 45 |
| Thread 1 | Thread 2 | P/No | Part No | Part No |
| NPT | NPT | | | 2049-2-2S |
| 1/8-27 | 1/8-27 | | 2045-2-2S | |
| 1/4-18 | 1/8-27 | 2081-4-2S | | |
| 1/4-18 | 1/4-18 | | 2045-4-4S | |
| 3/8-18 | 1/8-27 | 2081-6-2S | | 2049-4-4S |
| 3/8-18 | 1/4-18 | 2081-6-4S | 2045-6-4S | |
| 3/8-18 | 3/8-18 | | 2045-6-6S | 2049-6-6S |
| 3/8-18 | 1/2-14 | | | 2049-6-8S |
| 1/2-14 | 1/8-27 | 2081-8-2S | | |
| 1/2-14 | 1/4-18 | 2081-8-4S | | |
| 1/2-14 | 3/8-18 | 2081-8-6S | 2045-8-6S | 2049-8-6S |
| 1/2-14 | 1/2-14 | | 2045-8-8S | 2049-8-8S |
| 3/4-14 | 1/4-18 | 2081-12-4S | | |
| 3/4-14 | 3/8-18 | 2081-12-6S | | |
| 3/4-14 | 1/2-14 | 2081-12-8S | | |
| 3/4-14 | 3/4-14 | | 2045-12-12S | 2049-12-12S |
| 1-111/2 | 3/4-14 | 2081-16-12S | 2045-16-12S | |
| 1-11 1/2 | 1/2-14 | 2081-16-8S | | |
| 1-11 1/2 | 1-11 1/2 | | 2045-16-16S | 2049-16-16S |
| 1 1/4-11 1/2 | 3/4-14 | 2081-20-12S | | |
| 1 1/4-11 1/2 | 1-11 1/2 | 2081-20-16S | | |
| 1 1/2-11 1/2 | 3/4-14 | 2081-24-12S | | |
| 1 1/4-11 1/2 | 1 1/4-11 1/2 | | 2045-20-20S | |
| 1 1/2-11 1/2 | 1-11 1/2 | 2081-24-16S | | |
| 1 1/2-11 1/2 | 1 1/4-11 1/2 | 2081-24-20S | | |
| 1 1/2-11 1/2 | 1 1/2-11 1/2 | | 2045-24-24S | |
| 2-11 1/2 | 3/4-14 | 2081-32-12S | | |
| 2-11 1/2 | 1-11 1/2 | 2081-32-16S | | |
| 2-11 1/2 | 1 1/4-11 1/2 | 2081-32-20S | | |
| 2-11 1/2 | 2-11 1/2 | | 2045-32-32S | |
| 2 1/2-8 | 2-11 1/2 | 2081-40-32S | | |



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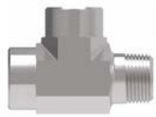
## NPT X NPT

| | | T1 / T2 | T1 / T2 | T1 / T2  |
|---|---|---|---|---|
| | | NPSM X NPT<br>F X M 90 | NPT TEE<br>F X F X M | NPT TEE<br>M X F X F |
| Thread 1 | Thread 2 | P/No | Part No | Part No |
| NPT | NPT | | | |
| 1/8-27 | 1/8-27 | 2047-2-2S | 2091-2-2S | 2092-2-2S |
| 1/4-18 | 1/4-18 | 2047-4-4S | 2091-4-4S | 2092-4-4S |
| 1/4-18 | 3/8-18 | 2047-4-6S | 2091-6-6S | 2092-6-6S |
| 3/8-18 | 3/8-18 | 2047-6-6S | 2091-6-6S | 2092-6-6S |
| 1/2-14 | 1/2-14 | 2047-8-8S | 2091-8-8S | 2092-8-8S |
| 3/4-14 | 3/4-14 | 2047-12-12S | 2091-12-12S | 2092-12-12S |
| 1-11 1/2 | 1-11 1/2 | 2047-16-16S | 2091-16-16S | 2092-16-16S |
| 1 1/4-11 1/2 | 1 1/4-11 1/2 | | 2091-12-12S | 2092-12-12S |

## NPT X NPT

| | | T1 / T2 | T1 / T2 |
|---|---|---|---|
| | | NPT SOCKET | NPT FEMALE 90 DEG |
| Thread 1 | Thread 2 | Part No | Part No |
| NPT | NPT | | |
| 1/8-27 | 1/8-27 | 2096-2S | 2087-2-2S |
| 1/4-18 | 1/8-27 | | 2087-4-2S |
| 1/4-18 | 1/4-18 | 2096-4S | 2087-4-4S |
| 3/8-18 | 1/4-18 | | 2087-6-4S |
| 1/2-14 | 1/2-14 | 2096-6S | 2087-6-6S |
| 1/2-14 | 3/8-18 | | 2087-8-6S |
| 1/2-14 | 1/2-14 | 2096-8S | 2087-8-8S |
| 3/4-14 | 1/2-14 | | 2087-12-8S |
| 3/4-14 | 3/4-14 | 2096-12S | 2087-12-12S |
| 1 1/4-11 1/2 | 1 1/4-11 1/2 | | |
| 3/4-14 | 3/4-14 | | |
| 1-11 1/2 | 1-11 1/2 | 2096-16S | 2087-16-16S |



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| NPT X NPT | | T1 T2 | T1 |
|---|---|---|---|
| | | NPT FEMALE TEE | NPT PLUG |
| Thread 1 | Thread 2 | | |
| NPT | NPT | Part No | Part No |
| 1/8-27 | 1/8-27 | 2090-2-2S | 2082-2S |
| 1/4-18 | 1/4-18 | 2090-4-4S | 2082-4S |
| 1/4-18 | 3/8-18 | | |
| 3/8-18 | 3/8-18 | 2090-6-6S | 2082-6S |
| 1/2-14 | 1/2-14 | 2090-8-8S | 2082-8S |
| 3/4-14 | 3/4-14 | 2090-12-12S | 2082-12S |
| 1-11 1/2 | 1-11 1/2 | 2090-16-16S | 2082-16S |
| 1 1/4-11 1/2 | 1 1/4-11 1/2 | | 2082-20S |



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## NPT X JIC

| Thread 1 | Thread 2 | NPT X JIC | NPT X JIC M X M 45 | NPT X JIC M X M 90 |
|---|---|---|---|---|
| NPT | JIC | Part No | Part No | Part No |
| 1/8-27 | 3/8-24 | 2021-2-3S | | 2024-2-3S |
| 1/8-27 | 7/16-20 | 2021-2-4S | 2023-2-4S | 2024-2-4S |
| 1/8-27 | 1/2-20 | 2021-2-5S | 2023-2-5S | 2024-2-5S |
| 1/8-27 | 9/16-18 | 2021-2-6S | | 2024-2-6S |
| 1/4-18 | 7/16-20 | 2021-4-4S | 2023-4-4S | 2024-4-4S |
| 1/4-18 | 1/2-20 | 2021-4-5S | 2023-4-5S | 2024-4-5S |
| 1/4-18 | 9/16-18 | 2021-4-6S | 2023-4-6S | 2024-4-6S |
| 1/4-18 | 3/4-16 | | 2023-4-8S | 2024-4-8S |
| 3/8-18 | 7/16-20 | 2021-6-4S | | 2024-6-4S |
| 1/4-18 | 3/4-16 | 2021-4-8S | | |
| 3/8-18 | 9/16-18 | 2021-6-6S | 2023-6-6S | 2024-6-6S |
| 3/8-18 | 3/4-16 | 2021-6-8S | 2023-6-8S | 2024-6-8S |
| 1/2-14 | 9/16-18 | 2021-8-6S | | |
| 3/8-18 | 7/8-14 | 2021-6-10S | 2023-6-10S | 2024-6-10S |
| 1/2-14 | 9/16-18 | | 2023-8-6S | 2024-8-6S |
| 1/2-14 | 3/4-16 | 2021-8-8S | 2023-8-8S | 2024-8-8S |
| 1/2-14 | 7/8-14 | 2021-8-10S | 2023-8-10S | 2024-8-10S |
| 3/4-14 | 3/4-16 | 2021-12-8S | | |
| 1/2-14 | 1 1/16-12 | 2021-8-12S | 2023-8-12S | 2024-8-12S |
| 3/4-14 | 9/16-18 | | | 2024-12-6S |
| 3/4-14 | 3/4-16 | | 2023-12-8S | 2024-12-8S |
| 3/4-14 | 7/8-14 | 2021-12-10S | 2023-12-10S | 2024-12-10S |
| 3/4-14 | 1 1/16-12 | 2021-12-12S | 2023-12-12S | 2024-12-12S |
| 3/4-14 | 1 5/16-12 | 2021-12-16S | 2023-12-16S | |
| 3/4-14 | 1 5/16-12 | | | 2024-12-16S |
| 1-11 1/2 | 1 1/16-12 | 2021-16-12S | | 2024-16-12S |
| 1-11 1/2 | 1 5/16-12 | 2021-16-16S | 2023-16-16S | 2024-16-16S |
| 1-11 1/2 | 1 5/8-12 | 2021-16-20S | | 2024-16-20S |
| 1 1/4-11 1/2 | 1 5/16-12 | 2021-20-16S | | |
| 1 1/4-11 1/2 | 1 5/8-12 | 2021-20-20S | 2023-20-20S | 2024-20-20S |
| 1 1/2-11 1/2 | 1 7/8-12 | 2021-24-24S | | 2024-24-24S |
| 2-11 1/2 | 2 1/2-12 | 2021-32-32S | | 2024-32-32S |



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## NPT X JIC

| | | | | |
|---|---|---|---|---|
| | | NPT X JIC MALE TEE | NPT X JIC F X M | NPT X JIC F X M 90 |
| Thread 1 | Thread 2 | | | |
| NPT | JIC | Part No | Part No | Part No |
| 1/8-27 | 3/8-24 | 2028-2-3S | | |
| 1/8-27 | 7/16-20 | 2028-2-4S | 2022-2-4S | 2025-2-4S |
| 1/8-27 | 1/2-20 | 2028-2-5S | | 2025-2-5S |
| 1/8-27 | 9/16-18 | | | 2025-2-6S |
| 1/4-18 | 7/16-20 | 2028-4-4S | 2022-4-4S | 2025-4-4S |
| 1/4-18 | 1/2-20 | 2028-4-5S | 2022-4-5S | 2025-4-5S |
| 1/4-18 | 9/16-18 | 2028-4-6S | 2022-4-6S | 2025-4-6S |
| 1/4-18 | 3/4-16 | | | 2025-4-8S |
| 3/8-18 | 7/16-20 | | | 2025-6-4S |
| 3/8-18 | 9/16-18 | 2028-6-6S | 2022-6-6S | 2025-6-6S |
| 3/8-18 | 3/4-16 | 2028-6-8S | 2022-6-8S | 2025-6-8S |
| 3/8-18 | 7/8-14 | 2028-6-10S | | |
| 1/2-14 | 9/16-18 | 2028-8-6S | | 2025-8-6S |
| 1/2-14 | 3/4-16 | 2028-8-8S | 2022-8-8S | 2025-8-8S |
| 1/2-14 | 7/8-14 | 2028-8-10S | 2022-8-10S | 2025-8-10S |
| 1/2-14 | 1 1/16-12 | | 2022-8-12S | 2025-8-12S |
| 3/4-14 | 7/8-14 | | 2022-12-10S | |
| 3/4-14 | 1 1/16-12 | 2028-12-12S | 2022-12-12S | 2025-12-12S |
| 3/4-14 | 1 5/16-12 | 2028-12-16S | | |
| 1-11 1/2 | 1 5/16-12 | 2028-16-16S | 2022-16-16S | 2025-16-16S |
| 1 1/4-11 1/2 | 1 5/8-12 | 2028-20-20S | | 2025-20-20S |
| 1 1/2-11 1/2 | 1 7/8-12 | | | 2025-24-24S |
| 2-11 1/2 | 2 1/2-12 | | | 2025-32-32S |



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## ORS X UNO'

| | | ORS X UNO' M X M | ORS X UNO' M X M LONG | ORS X UNO' M X M 45 |
|---|---|---|---|---|
| Thread 1 | Thread 2 | Part No | Part No | Part No |
| ORS | UNO | | | |
| 9/16-18 | 7/16-20 | FF1852T0404S | FF1854T0404S | FF2068T0404S |
| 9/16-18 | 9/16-18 | FF1852T0406S | | FF2068T0406S |
| 9/16-18 | 3/4-16 | FF1852T0408S | | FF2068T0408S |
| 11/16-16 | 7/16-20 | FF1852T0604S | | FF2068T0604S |
| 11/16-16 | 9/16-18 | FF1852T0606S | FF1854T0606S | FF2068T0606S |
| 11/16-16 | 3/4-16 | FF1852T0608S | FF1854T0608S | FF2068T0608S |
| 11/16-16 | 7/8-14 | FF1852T0610S | | |
| 11/16-16 | 1 1/16-12 | FF1852T0612S | | |
| 13/16-16 | 9/16-18 | FF1852T0806S | | FF2068T0806S |
| 13/16-16 | 3/4-16 | FF1852T0808S | FF1854T0808S | FF2068T0808S |
| 13/16-16 | 7/8-14 | FF1852T0810S | | FF2068T0810S |
| 13/16-16 | 1 1/16-12 | FF1852T0812S | | |
| 1-14 | 3/4-16 | FF1852T1008S | | FF2068T1008S |
| 1-14 | 7/8-14 | FF1852T1010S | FF1854T1010S | FF2068T1010S |
| 1-14 | 1 1/16-12 | FF1852T1012S | | FF2068T1012S |
| 1 3/16-12 | 3/4-16 | FF1852T1208S | | |
| 1 3/16-12 | 7/8-14 | FF1852T1210S | | FF2068T1210S |
| 1 3/16-12 | 1 1/16-12 | FF1852T1212S | FF1854T1212S | FF2068T1212S |
| 1 3/16-12 | 1 5/16-12 | FF1852T1216S | | FF2068T1216S |
| 1 7/16-12 | 1 1/16-12 | FF1852T1612S | | FF2068T1612S |
| 1 7/16-12 | 1 5/16-12 | FF1852T1616S | FF1854T1616S | FF2068T1616S |
| 1 7/16-12 | 1 5/8-12 | FF1852T1620S | | |
| 1 11/16-12 | 1 5/16-12 | FF1852T2016S | | |
| 1 11/16-12 | 1 5/8-12 | FF1852T2020S | FF1854T2020S | FF2068T2020S |



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## ORS X UNO'

| | | | | |
|---|---|---|---|---|
| | | ORS X UNO' | ORS X UNO' | ORS X UNO' |
| Thread 1 | Thread 2 | M X M 90 DEG | MALE TEE | MALE TEE |
| ORS | UNO | Part No | Part No | Part No |
| 9/16-18 | 7/16-20 | FF1868T0404S | FF1861T0404S | FF1865T0404S |
| 9/16-18 | 9/16-18 | FF1868T0406S | | FF1865T0406S |
| 11/16-16 | 7/16-20 | FF1868T0604S | | FF1865T0604S |
| 11/16-16 | 9/16-18 | FF1868T0606S | FF1861T0606S | FF1865T0606S |
| 11/16-16 | 3/4-14 | FF1868T0608S | FF1861T0608S | |
| 11/16-16 | 7/8-14 | FF1868T0610S | | |
| 13/16-16 | 9/16-18 | FF1868T0806S | | FF1865T0806S |
| 13/16-16 | 3/4-14 | FF1868T0808S | FF1861T0808S | FF1865T0808S |
| 13/16-16 | 7/8-14 | FF1868T0810S | | |
| 13/16-16 | 1 1/16-12 | FF1868T0812S | | FF1865T0812S |
| 1-14 | 3/4-14 | FF1868T1008S | | |
| 1-14 | 7/8-14 | FF1868T1010S | FF1861T1010S | FF1865T1010S |
| 1-14 | 1 1/16-12 | FF1868T1012S | | FF1865T1012S |
| 1 3/16-12 | 7/8-14 | FF1868T1210S | FF1861T1210S | |
| 1 3/16-12 | 1 1/16-12 | FF1868T1212S | FF1861T1212S | FF1865T1212S |
| 1 3/16-12 | 1 5/16-12 | FF1868T1216S | | |
| 1 7/16-12 | 1 1/16-12 | FF1868T1612S | | |
| 1 7/16-12 | 1 5/16-12 | FF1868T1616S | FF1861T1616S | FF1865T1616S |
| 1 11/16-12 | 1 5/16-12 | FF1868T2016S | | |
| 1 11/16-12 | 1 5/8-12 | FF1868T2020S | FF1861T2020S | FF1865T2020S |



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## ORS X ORS

| | | ORS X ORS M X M | ORS X ORS M X M BULKHEAD | ORS X ORS M X M 90 |
|---|---|---|---|---|
| Thread 1 | Thread 2 | Part No | Part No | Part No |
| ORS | ORS | | | |
| 9/16-18 | 9/16-18 | FF2000T0404S | FF1994T0404S | FF2035T0404S |
| 11/16-16 | 9/16-18 | FF2000T0604S | | FF2035T0604S |
| 11/16-16 | 11/16-16 | FF2000T0606S | FF1994T0606S | FF2035T0606S |
| 13/16-16 | 13/16-16 | FF2000T0808S | FF1994T0808S | FF2035T0808S |
| 1-14 | 13/16-16 | FF2000T1008S | | |
| 1-14 | 1-14 | FF2000T1010S | FF1994T1010S | FF2035T1010S |
| 1 3/16-12 | 13/16-16 | | | FF2035T1208S |
| 1 3/16-12 | 1-14 | FF2000T1210S | | |
| 1 3/16-12 | 1 3/16-12 | FF2000T1212S | FF1994T1212S | FF2035T1212S |
| 1 7/16-12 | 1 3/16-12 | FF2000T1612S | | |
| 1 7/16-12 | 1 7/16-12 | FF2000T1616S | FF1994T1616S | FF2035T1616S |
| 1 11/16-12 | 1 11/16-12 | FF2000T2020S | FF1994T2020S | FF2035T2020S |
| 2-12 | 2-12 | FF2000T2424S | FF1994T2424S | FF2035T2424S |



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## ORS X ORS

| Thread 1 | Thread 2 | ORS X ORS M X M BULKHEAD 90 | ORS X ORS MALE TEE | ORS X ORS M X F |
|---|---|---|---|---|
| ORS | ORS | Part No | Part No | Part No |
| 9/16-18 | 9/16-18 | FF2030T0404S | FF1898T0404S | |
| 9/16-18 | 11/16-16 | | | FF2281T0406S |
| 9/16-18 | 13/16-16 | | | FF2281T0408S |
| 9/16-18 | 1-14 | | | FF2281T0410S |
| 9/16-18 | 1 3/16-12 | | | FF2281T0412S |
| 11/16-16 | 11/16-16 | FF2030T0606S | FF1898T0606S | |
| 11/16-16 | 13/16-16 | | FF1898T0608S | FF2281T0608S |
| 11/16-16 | 1-14 | | | FF2281T0610S |
| 11/16-16 | 1 3/16-12 | | | FF2281T0612S |
| 13/16-16 | 11/16-16 | FF2030T0806S | | |
| 13/16-16 | 13/16-16 | FF2030T0808S | FF1898T0808S | |
| 13/16-16 | 1-14 | | | FF2281T0810S |
| 13/16-16 | 1 3/16-12 | | | FF2281T0812S |
| 13/16-16 | 1 7/16-12 | | | FF2281T0816S |
| 1-14 | 1-14 | FF2030T1010S | FF1898T1010S | |
| 1 3/16-12 | 1 3/16-12 | FF2030T1212S | FF1898T1212S | |
| 1 7/16-12 | 1 3/16-12 | | FF1898T1216S | |
| 1 7/16-12 | 1 7/16-12 | FF2030T1616S | FF1898T1616S | FF2281T1616S |
| 1 7/16-12 | 1 11/16-12 | | | FF2281T1620S |
| 1 11/16-12 | 1 7/16-12 | | FF1898T2016S | |
| 1 11/16-12 | 1 11/16-12 | FF2030T2020S | FF1898T2020S | |
| 2-12 | 2-12 | FF2030T2424S | FF1898T2424S | |

## ORS X ORS

| Thread 1 | Thread 2 | ORS X ORS M X F | ORS X ORS F X M X M | ORS X ORS M X M X F TEE |
|---|---|---|---|---|
| ORS | ORS | Part No | Part No | Part No |
| 9/16-18 | 9/16-18 | FF2098T0404S | FF2114T0404S | FF1857T0404S |
| 11/16-16 | 11/16-16 | FF2098T0606S | FF2114T0606S | FF1857T0606S |
| 13/16-16 | 13/16-16 | FF2098T0808S | FF2114T0808S | FF1857T0808S |
| 1-14 | 1-14 | FF2098T1010S | FF2114T1010S | FF1857T1010S |
| 1 3/16-12 | 13/16-16 | FF2098T1212S | FF2114T1212S | FF1857T1212S |
| 1 7/16-12 | 1 7/16-12 | FF2098T1616S | FF2114T1616S | FF1857T1616S |
| 1 11/16-12 | 1 11/16-12 | | FF2114T2020S | FF1857T2020S |
| 2-12 | 2-12 | | FF2114T2424S | FF1857T2424S |



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## ORS X ORS

| Thread 1 | | ORS CAP | ORS PLUG | |
|---|---|---|---|---|
| ORS | | Part No | Part No | |
| 9/16-18 | | FF9863-04S | FF9767-04S | |
| 11/16-16 | | FF9863-06S | FF9767-06S | |
| 13/16-16 | | FF9863-08S | FF9767-08S | |
| 1-14 | | FF9863-10S | FF9767-10S | |
| 1 3/16-12 | | FF9863-12S | FF9767-12S | |
| 1 7/16-12 | | FF9863-16S | FF9767-16S | |
| 1 11/16-12 | | FF9863-20S | FF9767-20S | |
| 2-12 | | FF9863-24S | FF9767-24S | |

## ORS X BSPP

| Thread 1 | Thread 2 | ORS X BSPP M X M | ORS X BSPP M X M 90 DEG | |
|---|---|---|---|---|
| ORS | BSPP | Part No | Part No | |
| 9/16-18 | 1/4-19 | B2033-4-4S | B2034-4-4S | |
| 9/16-18 | 3/8-19 | B2033-4-6S | B2034-4-6S | |
| 9/16-18 | 1/2-14 | B2033-4-8S | B2034-4-8S | |
| 9/16-18 | 1/4-19 | B2033-4-4S | | |
| 11/16-16 | 1/4-19 | B2033-6-4S | B2034-6-4S | |
| 11/16-16 | 3/8-19 | B2033-6-6S | B2034-6-6S | |
| 11/16-16 | 1/2-14 | B2033-6-8S | B2034-6-8S | |
| 13/16-16 | 3/8-19 | B2033-8-6S | | |
| 13/16-16 | 1/2-14 | B2033-8-8S | B2034-8-8S | |
| 13/16-16 | 3/4-14 | B2033-8-12S | B2034-8-12S | |
| 1-14 | 3/4-14 | B2033-10-12S | | |
| 1 3/16-12 | 3/4-14 | B2033-12-12S | B2034-12-12S | |
| 1 3/16-12 | 1-11 | B2033-12-16S | | |
| 1 7/16-12 | 3/4-14 | B2033-16-12S | | |
| 1 7/16-12 | 1-11 | B2033-16-16S | | |
| 1 7/16-12 | 1 1/4-11 | B2033-16-20S | | |
| 1 11/16-12 | 1-11 | B2033-20-16S | | |
| 1 11/16-12 | 1 1/4-11 | B2033-20-20S | | |
| 2-12 | 1 1/2-11 | B2033-24-24S | | |



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## MET X JIC

| Thread 1 | Thread 2 | Metric X JIC M X M |
|---|---|---|
| JIC | Metric | Part No |
| 7/16-20 | M10 X 1 | D147-0710 |
| 7/16-20 | M12 X 1.5 | D147-0712 |
| 9/16-18 | M14 X 1.5 | D147-0914 |
| 9/16-18 | M18 X 1.5 | D147-0918 |
| 9/16-18 | M20 X 1.5 | D147-0920 |
| 3/4-16 | M18 X 1.5 | D147-1218 |
| 3/4-16 | M20 X 1.5 | D147-1220 |
| 3/4-16 | M22 X 1.5 | D147-1222 |
| 7/8-14 | M18 X 1.5 | D147-1418 |
| 7/8-14 | M20 X 1.5 | D147-1420 |
| 1 1/16-12 | M22 X 1.5 | D147-1722 |
| 1 1/16-12 | M26 X 1.5 | D147-1726 |
| 1 1/16-12 | M27 X 1.5 | D147-1727 |
| 1 5/16-12 | M26 X 1.5 | D147-2126 |
| 1 5/16-12 | M33 X 2 | D147-2133 |
| 1 5/8-12 | M42 X 2 | D147-2642 |

## FLANGE

| Thread 1 | Thread 2 | CODE 61 SPLIT FLANGE | CODE 62 SPLIT FLANGE |
|---|---|---|---|
| Flange | "A" | P/No | Part No |
| 1/2 | 1.50 | 449-74446-8 | FC3425-8-449 |
| 3/4 | 1.88 | 449-74446-12 | FC3425-12-449 |
| 1 | 2.06 | 449-74446-16 | FC3425-16-449 |
| 1 1/4 | 2.31 | 449-74446-20 | FC3425-20-449 |
| 1 1/2 | 2.75 | 449-74446-24 | FC3425-24-449 |
| 2 | 3.06 | 449-74446-32 | FC3425-32-449 |



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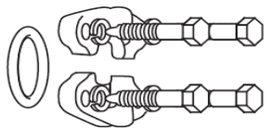
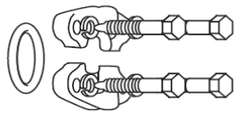
# SPLIT FLANGE KITS CD 61 SAE J518



| Size | Complete Kit | Flange Halves - Two required | Buna N O Ring - One required | Bolts* & Lock Washers# - Four required of each part |
|---|---|---|---|---|
| 1/2 | FF593-08 | 449-74446-8 | FF9446-210 | FF9442-0520-94* |
| | | | | 210104-5S# |
| 3/4 | FF593-12 | 449-74446-12 | FF9446-214 | FF9442-0620-94* |
| | | | | 210104-6S# |
| 1 | FF593-16 | 449-74446-16 | FF9446-219 | FF9442-0620-94* |
| | | | | 210104-2-6S# |
| 1 1/4 | FF593-20 | 449-74446-20 | FF9446-222 | FF9442-0724-94* |
| | | | | 210104-7S# |
| 1 1/2 | FF593-24 | 449-74446-24 | FF9446-225 | FF9442-0824-94* |
| | | | | 210104-8S# |
| 2 | FF593-32 | 449-74446-32 | FF9446-228 | FF9442-0824-94* |
| | | | | 210104-8S# |
| 2 1/2 | FF593-40 | 449-74446-40 | FF9446-232 | FF9442-0828-94* |
| | | | | 210104-8S# |
| 3 | FF593-48 | 449-74446-48 | FF9446-237 | FF9442-1028-94* |
| | | | | 210104-10# |

# SPLIT FLANGE KITS CD 62 SAE J518



| Size | Complete Kit | Flange Halves | Buna N O Ring | Bolts* & Lock Washers# |
|---|---|---|---|---|
| 3/4 | FF595-12 | FC3425-12-449 | FF9446-214 | FF9442-0624-94* |
| | | | | 210104-6S# |
| 1 | FF595-16 | FC3425-16-449 | FF9446-219 | FF9442-0728-94* |
| | | | | 210104-7S# |
| 1 1/4 | FF595-20 | FC3425-20-449 | FF9446-222 | FF9442-0828-94* |
| | | | | 210104-8S# |
| 1 1/2 | FF595-24 | FC3425-24-449 | FF9446-225 | FF9442-1036-94* |
| | | | | 210104-10S# |
| 2 | FF595-32 | FC3425-32-449 | FF9446-228 | FF9442-1244-94* |
| | | | | 210104-12S# |



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# O RINGS

| | | | | |
|---|---|---|---|---|
| | | ORS O RING | CAT 'D' SECTION | 4S/6S STEM O RINGS |
| Size | | Part No | Part No | Part No |
| -4 | | | | |
| -6 | | FF9446-11 | | |
| -8 | | FF9446-12 | | |
| -10 | | FF9446-14 | | |
| -12 | | FF9446-16 | FF90319-12 | FF91157-12 |
| -16 | | FF9446-18 | FF90319-16 | FF91157-16 |
| -20 | | FF9446-21 | FF90319-20 | FF91157-20 |
| -24 | | FF9446-25 | FF90319-24 | FF91157-24 |
| -32 | | FF9446-29 | FF90319-32 | FF91157-32 |
| | | | | |
| | | FLANGE O RING BUNA N | FLANGE O RING EPDM | FLANGE O RING VITON |
| Size | | Part No | Part No | Part No |
| -4 | | | | |
| -6 | | | | |
| -8 | | FF9446-210 | FF9016-210 | 22046-210 |
| -10 | | | | |
| -12 | | FF9446-214 | FF9016-214 | 22046-214 |
| -16 | | FF9446-219 | FF9016-219 | 22046-219 |
| -20 | | FF9446-222 | FF9016-222 | 22046-222 |
| -24 | | FF9446-225 | FF9016-225 | 22046-225 |
| -32 | | FF9446-228 | FF9016-228 | 22046-228 |
| -40 | | FF9446-232 | FF9016-232 | 22046-232 |
| -48 | | FF9446-237 | FF9016-237 | 22046-237 |



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## DOWTY

| | | | | |
|---|---|---|---|---|
| | | BSP SEAL | METRIC SEAL | |
| Size Inch | Size MM ID | Part No | Part No | |
| -2 | 6.7 | DS-2 | DSM-6 | |
| -4 | 8.5 | DS-4 | DSM-8 | |
| -6 | 10.3 | DS-6 | DSM-10 | |
| -8 | 12.7 | DS-8 | DSM-12 | |
| -12 | 14.7 | DS-12 | DSM-14 | |
| -16 | 16.7 | DS-16 | DSM-16 | |
| -20 | 18.7 | DS-20 | DSM-18 | |
| -24 | 20.7 | DS-24 | DSM-20 | |
| -32 | | DS-32 | | |



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## ISO 'A' couplings - Female half

| Part No. | | |
|---|---|---|
| HA1501100 | 1/4" CPLG FHALF ISO A BSPP | |
| HA1502100 | 3/8"CPLG FHALF ISO A BSPP | |
| HA1503100 | 1/2"CPLG FHALF ISO A BSPP | |
| HA1504100 | 3/4"CPLG FHALF ISO A BSPP | |
| HA1505100 | 1" CPLG FHALF ISO A BSPP | |
| HA1521100 | 1/4"CPLG FHALF ISO A NPT | |
| HA1522100 | 3/8"CPLG FHALF ISO A NPT | |
| HA1523100 | 1/2"CPLG FHALF ISO A NPT | |
| HA1524100 | 3/4"CPLG FHALF ISO A NPT | |
| HA1525100 | 1" CPLG FHALF ISO A NPT | |

## ISO 'A' couplings - Male half

| Part No. | | |
|---|---|---|
| HA1501200 | 1/4"CPLG MHALF ISO A BSPP | |
| HA1502200 | 3/8"CPLG MHALF ISO A BSPP | |
| HA1503200 | 1/2"CPLG MHALF ISO A BSPP | |
| HA1504200 | 3/4"CPLG MHALF ISO A BSPP | |
| HA1505200 | 1"CPLG MHALF ISO A BSPP | |
| HA1521200 | 1/4"CPLG MHALF ISO A NPT | |
| HA1522200 | 3/8"CPLG MHALF ISO A NPT | |
| HA1523200 | 1/2"CPLG MHALF ISO A NPT | |
| HA1524200 | 3/4"CPLG MHALF ISO A NPT | |
| HA1525200 | 1"CPLG MHALF ISO A NPT | |



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## ISO 'A' couplings dust cap

Dust Cap

| Part No. | | |
|---|---|---|
| 5657-4 | CPLG DUST COVER | |
| 5657-6 | CPLG DUST COVER | |
| 5657-10 | CPLG DUST COVER | |
| 5657-12 | CPLG DUST COVER | |
| 5657-16 | CPLG DUST COVER | |

## ISO 'A' couplings dust plug

Dust Plug

| Part No. | | |
|---|---|---|
| 5659-4 | CPLG DUST PLUG | |
| 5659-6 | CPLG DUST PLUG | |
| 5659-10 | CPLG DUST PLUG | |
| 5659-12 | CPLG DUST PLUG | |
| 5659-16 | CPLG DUST PLUG | |

## FD49 Flat face female coupling HTMA Interchange

| Part No. | | |
|---|---|---|
| FD49-1001-06-06 | CPLG FHALF FLAT FACE NPT | |
| FD49-1001-08-06 | CPLG FHALF FLAT FACE NPT | |

## FD49 Flat face female coupling HTMA Interchange

| Part No. | | |
|---|---|---|
| FD49-1002-06-06 | CPLG MHALF FACE NPT F | |
| FD49-1002-08-06 | CPLG MHALF FLAT FACE NPT | |



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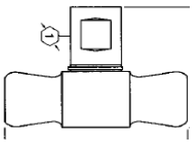
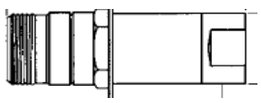
## 5100 Brass low spill coupling - Female



| Part No. | | |
|---|---|---|
| 5100-S5-4B | CPLG FHALF BRASS 1/18I N | |
| 5100-S5-6B | CPLG FHALF BRASS 1/4I NP | |
| 5100-S5-8B | CPLG FHALF BRASS 3/8I NP | |
| 5100-S5-10B | CPLG FHALF BRASS 1/2I NP | |
| 5100-S5-12B | CPLG FHALF BRASS 3/4I NP | |
| 5100-S5-16B | CPLG FHALF BRASS 1I NPT | |
| 5100-S5-20B | CPLG FHALF BRASS 1 1/4I | |
| 5100-S5-24B | CPLG FHALF BRASS 1 1/2I | |

## 5100 Brass low spill coupling - Male



| Part No. | | |
|---|---|---|
| 5100-S2-4B | MALE COUPLING HALF 1/8I | |
| 5100-S2-6B | CPLG MHALF BRASS 1/2I NP | |
| 5100-S2-8B | CPLG MHALF BRASS 3/8I NP | |
| 5100-S2-10B | CPLG MHALF BRASS 1/2I NP | |
| 5100-S2-12B | CPLG MHALF BRASS 3/4I NP | |
| 5100-S2-16B | CPLG MHALF BRASS 1I NPT | |
| 5100-S2-20B | CPLG MHALF BRASS 1 1/4I | |
| 5100-S2-24B | CPLG MHALF BRASS 1 1/2'Q | |

## FD69 Water blast coupling - Female

| Part No. | | |
|---|---|---|
| FD69-1001-08-08 | CPLG FHALF 700b W'BLAST | |

## FD69 Water blast coupling - Male

| Part No. | | |
|---|---|---|
| FD69-1002-08-08 | CPLG MHALF 700b W'BLAST | |



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## HK Series (Stainless steel)

ISO 7241-1 B Interchangeable

| Part No. | | |
|---|---|---|
| LL2H16BS | 1/4" CPLG FHALF ISO B BSPP STAINLESS | |
| LL3H21BS | 3/8" CPLG FHALF ISO B BSPP STAINLESS | |
| LL4HP26BS | 1/2" CPLG FHALF ISO B BSPP STAINLESS | |
| LL6HP31BS | 3/4" CPLG FHALF ISO B BSPP STAINLESS | |
| LL8HP38BS | 1" CPLG FHALF ISO B BSPP STAINLESS | |
| LL2K16BS | 1/4" CPLG MHALF ISO B BSPP STAINLESS | |
| LL3K21BS | 3/8" CPLG MHALF ISO B BSPP STAINLESS | |
| LL4KP26BS | 1/2" CPLG MHALF ISO B BSPP STAINLESS | |
| LL6KP31BS | 3/4" CPLG MHALF ISO B BSPP STAINLESS | |
| LL8KP38BS | 1" CPLG MHALF ISO B BSPP STAINLESS | |

## HKFR Series (Stainless steel)

ISO 7241-1 BOP ( Blow Out Preventer ) Lloyd's Register Certification

| Part No. | | |
|---|---|---|
| 4HFR26 | 1/2" CPLG FHALF ISO BOP STAINLESS 316L | |
| 4KFR26 | 1/2" CPLG MHALF ISO BOP STAINLESS 316L | |
| 6HFR31 | 3/4" CPLG FHALF ISO BOP STAINLESS 316L | |
| 6KFR31 | 3/4" CPLG MHALF ISO BOP STAINLESS 316L | |
| 8HFR36 | 1" CPLG FHALF ISO BOP STAINLESS 316L | |
| 8KFR36 | 1" CPLG MHALF ISO BOP STAINLESS 316L | |
| ML8HFR36 | 1" CPLG FHALF ISO BOP STAINLESS 316 | |
| ML8KFR36 | 1" CPLG MHALF ISO BOP STAINLESS 316 | |



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## ISO 16028 F/F couplings - Female half

| Part No. | | |
|---|---|---|
| 6FFS25BS | 1/4" BSPP FF CPLG FEMALE HALF 1/4" BODY ISO 16028 | |
| 10FFS37BS | 3/8" BSPP FF CPLG FEMALE HALF 3/8" BODY ISO 16028 | |
| 10FFS50BS | 1/2" BSPP FF CPLG FEMALE HALF 3/8" BODY ISO 16028 | |
| 12FFS50BS | 1/2" BSPP FF CPLG FEMALE HALF 1/2" BODY ISO 16028 | |
| 12FFS75BS | 3/4" BSPP FF CPLG FEMALE HALF 1/2" BODY ISO 16028 | |
| 19FFS75BS | 3/4" BSPP FF CPLG FEMALE HALF 3/4" BODY ISO 16028 | |
| 19FFS100BS | 1" BSPP FF CPLG FEMALE HALF 3/4" BODY ISO 16028 | |
| 25FFS100BS | 1" BSPP FF CPLG FEMALE HALF 1" BODY ISO 16028 | |
| 25FFS125BS | 1 1/4" BSPP FF CPLG FEMALE HALF 1" BODY ISO 16028 | |
| 40FFS150BS | 1 1/2" BSPP FF CPLG FEMALE HALF 1 1/2" BODY ISO 16028 | |
| 50FFS200BS | 2" BSPP FF CPLG FEMALE HALF 2" BODY ISO 16028 | |

## ISO 16028 F/F couplings - Male half

| Part No. | | |
|---|---|---|
| 6FFP25BS | 1/4" BSPP FF CPLG MALE HALF 1/4" BODY ISO 16028 | |
| 10FFP37BS | 3/8" BSPP FF CPLG MALE HALF 3/8" BODY ISO 16028 | |
| 10FFP50BS | 1/2" BSPP FF CPLG MALE HALF 3/8" BODY ISO 16028 | |
| 12FFP50BS | 1/2" BSPP FF CPLG MALE HALF 1/2" BODY ISO 16028 | |
| 12FFP75BS | 3/4" BSPP FF CPLG MALE HALF 1/2" BODY ISO 16028 | |
| 19FFP75BS | 3/4" BSPP FF CPLG MALE HALF 3/4" BODY ISO 16028 | |
| 19FFP100BS | 1" BSPP FF CPLG MALE HALF 3/4" BODY ISO 16028 | |
| 25FFP100BS | 1" BSPP FF CPLG MALE HALF 1" BODY ISO 16028 | |
| 25FFP125BS | 1 1/4" BSPP FF CPLG MALE HALF 1" BODY ISO 16028 | |
| 40FFP150BS | 1 1/2" BSPP FF CPLG MALE HALF 1 1/2" BODY ISO 16028 | |
| 50FFP200BS | 2" BSPP FF CPLG MALE HALF 2" BODY ISO 16028 | |



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## FD35 - 10,000 PSI Coupling - Female

| Part No. | | |
|---|---|---|
| FD35-1001-06-06 | CPLG FHALF 10000 PSI NPT | |

## FD35 - 10,000 PSI Coupling - Male

| Part No. | | |
|---|---|---|
| FD35-1002-06-06 | CPLG MHALF 10000 PSI NPT | |

## FD90 - Diagnostic coupling - Female

| Part No. | | |
|---|---|---|
| FD90-1021-02-04 | CPLG FHALF NPT F | |
| FD90-1021-04-04 | CPLG FHALF NPT F | |
| FD90-1041-04-04 | CPLG FHALF UNO' F | |

## FD90 - Diagnostic coupling - Male

| Part No. | | |
|---|---|---|
| FD90-1012-02-04 | CPLG MHALF NPT M | |
| FD90-1012-04-04 | CPLG MHALF NPT M | |
| FD90-1044-03-04 | CPLG MHALF UNO' | |
| FD90-1044-04-04 | CPLG MHALF UNO' | |
| FD90-1044-05-04 | CPLG MHALF UNO' | |
| FD90-1044-06-04 | CPLG MHALF UNO' | |



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## HK Series (Steel)

ISO 7241-1 B Interchangeable

| Part No. | | |
|---|---|---|
| 2H16BS | 1/4" CPLG FHALF ISO B BSPP STEEL | |
| 3H21BS | 3/8" CPLG FHALF ISO B BSPP STEEL | |
| 4HP26BS | 1/2" CPLG FHALF ISO B BSPP STEEL | |
| 6HP31BS | 3/4" CPLG FHALF ISO B BSPP STEEL | |
| 8HP38BS | 1" CPLG FHALF ISO B BSPP STEEL | |
| 2K16BS | 1/4" CPLG MHALF ISO B BSPP STEEL | |
| 3K21BS | 3/8" CPLG MHALF ISO B BSPP STEEL | |
| 4KP26BS | 1/2" CPLG MHALF ISO B BSPP STEEL | |
| 6KP31BS | 3/4" CPLG MHALF ISO B BSPP STEEL | |
| 8KP38BS | 1" CPLG MHALF ISO B BSPP STEEL | |

## HK Series (Brass)

ISO 7241-1 B Interchangeable

| Part No. | | |
|---|---|---|
| B2H16BS | 1/4" CPLG FHALF ISO B BSPP BRASS | |
| B3H21BS | 3/8" CPLG FHALF ISO B BSPP BRASS | |
| B4HP26BS | 1/2" CPLG FHALF ISO B BSPP BRASS | |
| B6HP31BS | 3/4" CPLG FHALF ISO B BSPP BRASS | |
| 8BHP38BS | 1" CPLG FHALF ISO B BSPP BRASS | |
| B2K16BS | 1/4" CPLG MHALF ISO B BSPP BRASS | |
| B3K21BS | 3/8" CPLG MHALF ISO B BSPP BRASS | |
| B4KP26BS | 1/2" CPLG MHALF ISO B BSPP BRASS | |
| B6KP31BS | 3/4" CPLG MHALF ISO B BSPP BRASS | |
| B8KP38BS | 1" CPLG MHALF ISO B BSPP BRASS | |



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## FS65000 90 Deg. Series

| Part No. | Description | |
|---|---|---|
| FS65000-0404-01 | SWIVEL JOINT NPSM X NPT M 1/4" | |
| FS65000-0606-01 | SWIVEL JOINT NPSM X NPT M 3/8" | |
| FS65000-0808-01 | SWIVEL JOINT NPSM X NPT M 1/2" | |
| FS65000-1212-01 | SWIVEL JOINT NPSM X NPT M 1/4" | |
| FS65000-1616-04 | SWIVEL JOINT NPSM X NPT M 1" | |

## FS65000 90 Deg Series seal kits

| Part No. | Description | |
|---|---|---|
| 10-62017-01 | SWIVEL JOINT SEAL KIT 1/4" | |
| 10-62018-01 | SWIVEL JOINT SEAL KIT 3/8" | |
| 10-62019-01 | SWIVEL JOINT SEAL KIT 1/2" | |
| 10-20201-01 | SWIVEL JOINT SEAL KIT 3/4" | |
| 10-62021-01 | SWIVEL JOINT SEAL KIT 1" | |



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## Imperial nominal bore pipe

| Part No. | Description | |
|---|---|---|
| NH1600C075B0250 | FLEXMASTER 0.75" NB PIPE | |
| NH1600C100B0288 | FLEXMASTER 1.00" NB PIPE | |
| NH1600C125B0325 | FLEXMASTER 1.25" NB PIPE | |
| NH1600C150B0350 | FLEXMASTER 1.50" NB PIPE | |
| NH1600C200B0400 | FLEXMASTER 2.00" NB PIPE | |
| NH1600C250B0650 | FLEXMASTER 2.50" NB PIPE | |
| NH1600C300B0650 | FLEXMASTER 3.00" NB PIPE | |
| NH1600C350B0650 | FLEXMASTER 3.50" NB PIPE | |
| NH1600C400B0650 | FLEXMASTER 4.00" NB PIPE | |
| NH1600C500B0650 | FLEXMASTER 5.00" NB PIPE | |
| NH1600C600B0650 | FLEXMASTER 6.00" NB PIPE | |

## Imperial tube

| Part No. | Description | |
|---|---|---|
| NH1625C075B0225 | FLEXMASTER 0.75" OD TUBE | |
| NH1625C100B0250 | FLEXMASTER 1.00" OD TUBE | |
| NH1625C125B0288 | FLEXMASTER 1.25" OD TUBE | |
| NH1625C150B0300 | FLEXMASTER 1.50" OD TUBE | |
| NH1625C175B0350 | FLEXMASTER 1.75" OD TUBE | |
| NH1625C200B0350 | FLEXMASTER 2.00" OD TUBE | |
| NH1625C225B0400 | FLEXMASTER 2.25" OD TUBE | |
| NH1600C250B0650 | FLEXMASTER 2.38" OD TUBE | |
| NH1625C250B0400 | FLEXMASTER 2.50" OD TUBE | |
| NH1625C275B0400 | FLEXMASTER 2.75" OD TUBE | |
| NH1625C300B0500 | FLEXMASTER 3.00" OD TUBE | |
| NH1625C325B0650 | FLEXMASTER 3.25" OD TUBE | |
| NH1600C300B0650 | FLEXMASTER 3.50" OD TUBE | |
| NH1600C400B0650 | FLEXMASTER 4.50" OD TUBE | |



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## Flexmaster gaskets

| Part No. | Description | |
|---|---|---|
| NK1000063C075 | 3/4 " PIPE FLEXMASTRER GASKET | |
| NK1000063C100 | 1 " PIPE FLEXMASTRER GASKET | |
| NK1000063C125 | 1 1/4 " PIPE FLEXMASTRER GASKET | |
| NK1000063C150 | 1 1/2 " PIPE FLEXMASTRER GASKET | |
| NK1000063C200 | 2 " PIPE FLEXMASTRER GASKET | |
| NK1000063C250 | 2 1/2 " PIPE FLEXMASTRER GASKET | |
| NK1000063C300 | 3 " PIPE FLEXMASTRER GASKET | |
| NK1000063C350 | 3 1/2 " PIPE FLEXMASTRER GASKET | |
| NK1000063C400 | 4 " PIPE FLEXMASTRER GASKET | |
| NK1000064C100 | 1 " TUBE FLEXMASTRER GASKET | |
| NK1000064C125 | 1 1/4 " TUBE FLEXMASTRER GASKET | |
| NK1000064C150 | 1 1/2 " TUBE FLEXMASTRER GASKET | |
| NK1000064C200 | 2 " TUBE FLEXMASTRER GASKET | |
| NK1000064C250 | 2 1/2 " TUBE FLEXMASTRER GASKET | |
| NK1000064C300 | 3 " TUBE FLEXMASTRER GASKET | |
| NK1000063C300 | 3 1/2 " TUBE FLEXMASTRER GASKET | |
| NK1000063C350 | 4 " TUBE FLEXMASTRER GASKET | |



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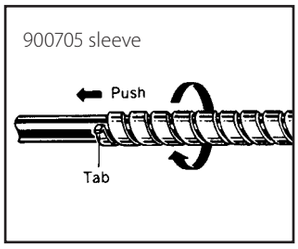
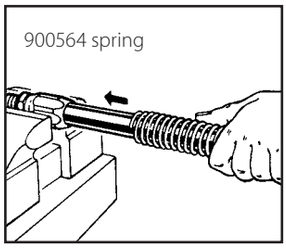
# Accessories

## Steel protective coil sleeve
**900705**

## Steel protective coil spring
**900564**




**Step 1**
Follow the appropriate assembly instructions through the assembly of one end fitting. Insert one end fitting in vise.

**Step 2**
Cut coil length. Coil should be cut to overall assembly length "OA" minus the sum of the overall length of each end fitting. ("A" dimension).

**Step 3**

**3a)** 900705 Steel Protective Coil Sleeve

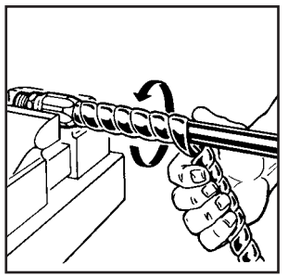
The hose and the coil should be held straight. Taping or capping the hose end can prevent frayed wire ends from snagging on the coil. Bend one end to the coil outward to form a slight tab to assist grasping. (Cut off or bend back when installation is complete.) Hold the tab with the thumb of one hand while twisting the coil clockwise approximately one foot back from the coil tab. When the coil opens up sufficiently, slip the tab end to the coil over the hose. Move the coil onto the hose by pulling at the tab end while pushing with the other hand. Be careful not to exceed the resiliency of the coil by stretching it too far.

**3b)** 900564 Steel Protective Coil Spring

Slide coil over hose.

**Step 4**
Proceed with assembly of second end fitting.

## Plastic coil sleeve
**900952**



**Step 1**
Follow the appropriate hose assembly instructions through the assembly of both end fittings. Insert end fitting in vise.

**Step 2**
Cut coil length. Coil should be cut to overall assembly length "OA" minus the sum of the overall length of each end fitting. ("A" dimension).

**Step 3**
Wrap the coil on the hose.



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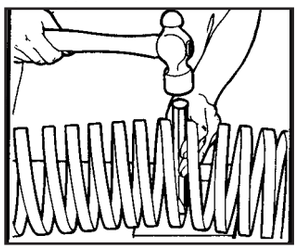
# Accessories

## Internal support coils

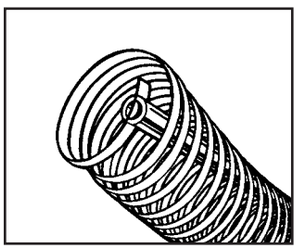
**222005, 222022**



### Step 1

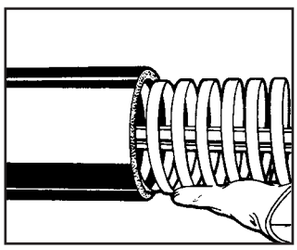
Cut coil length. The coils should be cut to the hose length, minus the nipple intrusion. For any given hose assembly the support coil length equals the overall hose assembly length minus the sum of the overall lengths of each end fitting. ("A" dimensions.)

Small size of the coil can usually be cut with strap cutters or sheet metal shears. The larger sizes are best cut with a heavy sharp chisel or bolt cutter. With small sizes skip directly to Step 3.



### Step 2

Compress the coil (large sizes only). It is necessary to reduce the coil diameter slightly in order to insert it into the hose. The easiest approach is to use a length of pipe with a notch cut in one end. Clamp the plain end of the pipe in a vise, slide the coil over the pipe and insert the free end of the coil into the notched end of the pipe. Then clamp the coil and pipe firmly together. Twist the coil to compress it prior to installation into the hose.



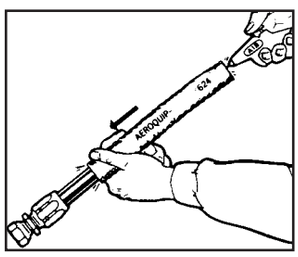
### Step 3

**Small sizes:** The coil can be worked into the hose by hand without difficulty. Remove all burrs from the coil prior to insertion. This will prevent cutting of the hose tube. Position the coil midway between hose ends.

**Large sizes:** With the pipe still in position, as in Step 2, assemble the hose over the coil. With the coil fully centered in the hose, remove the pipe and clamp.

## Firesleeve

**624**

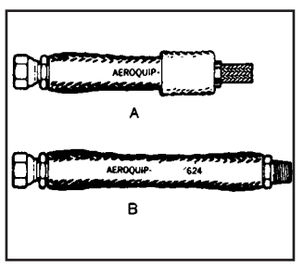



### Step 1

Follow the appropriate hose assembly instructions through the assembly of one end fitting. Cut firesleeve to same length as hose; using Firesleeve End Dip (AE13702–003) dip ends of firesleeve to a depth of three quarters of an inch and allow to dry at room temperature.

Start firesleeve over cut end of hose.

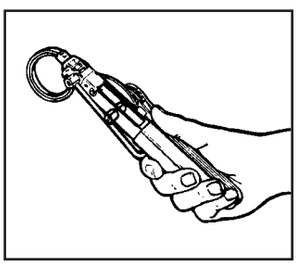
**NOTE: If applying sleeve over PTFE or stripped cover assemblies, wrap exposed wire with tape. Grasp sleeve and slip over the hose assembly as illustrated.**




### Step 2

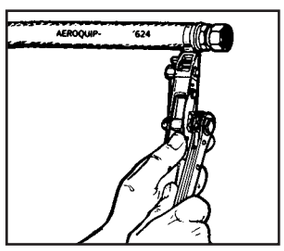
Skin sleeve back from cut end of hose enough to allow assembly of second end fitting. (2A)

Then center sleeve so that it completely covers both sockets. (2B)



### Step 3

Insert tail of band clamp into hand clamping tool.




### Step 4

Position band clamp over sleeve as shown and then draw tight with hand tool. Remove tool and cut free end of band clamp. Repeat on other end of assembly. To complete, bend protruding tail of clamp over clamp buckle. Also repair any scuffs or minor abrasions of firesleeve by brush application of End Dip AE13702–003.



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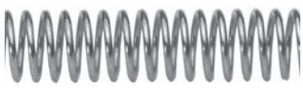
# 900564

## Steel protective coil spring



Protects hose cover and reinforcement from abrasion and accidental damage.

**Construction:** steel wire, rust resistant. This coil should fit snugly to the hose O.D. expanding the coil I.D. (unwind the coil) may be necessary for proper installation.

**For use with hose:**

see Accessories to hose chart pg 258 - 267

| 900564 | | |
|---|---|---|
| Sleeve dash # | Sleeve I.D. | |
| | **mm** | **in.** |
| -1S | 15,5 | 0.61 |
| -12S | 16,8 | 0.66 |
| -2S | 19,0 | 0.75 |
| -15S | 20,6 | 0.81 |
| -14S | 21,3 | 0.84 |
| -3S | 23,1 | 0.91 |
| -4S | 26,4 | 1.04 |
| -5S | 30,0 | 1.18 |
| -6S | 34,0 | 1.34 |
| -7S | 42,2 | 1.64 |
| -9S | 47,8 | 1.88 |
| -8S | 54,1 | 2.13 |
| -10S | 60,4 | 2.38 |
| -13S | 69,8 | 2.75 |
| -11S | 73,1 | 2.88 |

# 900705

## Steel protective coil sleeve

Recommended for use where hose lines are subjected to excessive abrasion, kinking or accidental damage.

**Construction:** spring steel, rust resistant. This coil should fit snugly to the hose O.D. expanding the coil I.D. (unwind the coil) may be necessary for proper installation.

**For use with hose:**

see Accessories to hose chart pg 258 - 267

| 900705 | | |
|---|---|---|
| Sleeve dash # | Sleeve I.D. | |
| | **mm** | **in.** |
| -17S | 11,2 | 0.44 |
| -1S | 12,7 | 0.50 |
| -13S | 14,5 | 0.57 |
| -2S | 16,0 | 0.63 |
| -3S | 19,0 | 0.75 |
| -4S | 22,3 | 0.88 |
| -5S | 26,2 | 1.03 |
| -14S | 28,2 | 1.11 |
| -6S | 31,0 | 1.22 |
| -7S | 37,3 | 1.47 |
| -9S | 42,9 | 1.69 |
| -8S | 48,5 | 1.91 |
| -10S | 54,1 | 2.13 |
| -11S | 65,0 | 2.56 |

# 900952

## Plastic protective coil spring

Recommended to protect hose from abrasion, this light weight plastic sleeve is unaffected by air, water, oil, gasoline, hydraulic and most other fluids. This coil can also be used for group bundling of hose lines. Temperature range of 0°F to +180°F.

**For use with hose:**

see Accessories to hose chart pg 258 - 267

| 900952 | | |
|---|---|---|
| Sleeve dash # | Sleeve I.D. | |
| | **mm** | **in.** |
| **900952-4** | 6,0 | 0.24 |
| **900952-6** | 9,5 | 0.37 |
| **900952-8** | 12,5 | 0.49 |
| **900952-10** | 16,0 | 0.63 |
| **900952-12** | 21,0 | 0.83 |
| **900952-16** | 27,0 | 1.06 |
| **900952-22** | 34,0 | 1.34 |
| **900952-30** | 40,0 | 1.58 |
| **900952-40** | 32,0 | 1.26 |
| **900952-48** | 79,0 | 3.11 |



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# 222005*, 222022

**Stainless steel internal support coils**

Recommended for vacuum service with most hose.

**For use with hose:**

see Accessories to hose chart pg 258 - 267

| 222005, 222022 | | |
|---|---|---|
| Part # O.D. | Coil | |
| | **mm** | **in.** |
| **222005-23C** | 8,6 | 0.34 |
| **222005-10C** | 10,7 | 0.42 |
| **222005-21C** | 12,9 | 0.51 |
| **222005-11C** | 15,2 | 0.60 |
| **222022-12C** | 17,8 | 0.70 |
| **222005-13C** | 18,5 | 0.73 |
| **222005-14C** | 23,9 | 0.94 |
| **222022-16C** | 24,6 | 0.97 |
| **222005-15C** | 30,2 | 1.19 |
| **222022-20C** | 31,7 | 1.25 |
| **222005-17C** | 36,6 | 1.44 |
| **222022-24C** | 38,1 | 1.50 |
| **222005-18C** | 47,7 | 1.88 |
| **222022-32C** | 50,0 | 1.97 |
| **222005-19C** | 62,0 | 2.44 |
| **222022-40C** | 67,8 | 2.67 |

*222005 is 301 stainless steel.

# FF9217

**Band style clamp**

Recommended for attaching sleeve to hose lines.

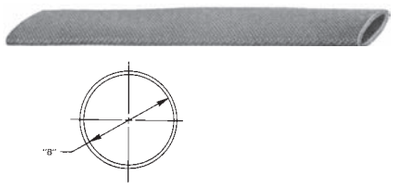
**Clamp numbers:**
FF9217- 0622S, FF9217-0648S; 3/8 inch wide
FF9217-0664C; 1/2 inch wide.

**For use with hose:**

see Accessories to hose chart pg 258 - 267

# FC425

**Nylon abrasion sleeve**
**Meets MSHA requirements**



Nylon sleeve protects hose from abrasion and allows bundling of hose lines.

**For use with hose:**

see Accessories to hose chart pg 258 - 267

| FC425 | | |
|---|---|---|
| Part # | Nominal Sleeve I.D.* "B" | |
| | **mm** | **in.** |
| **FC425-12** | 18,0 | 0.71 |
| **FC425-15** | 23,4 | 0.92 |
| **FC425-16** | 25,4 | 1.00 |
| **FC425-18** | 28,7 | 1.13 |
| **FC425-20** | 31,7 | 1.25 |
| **FC425-24** | 40,4 | 1.59 |
| **FC425-28** | 44,4 | 1.75 |
| **FC425-32** | 52,6 | 2.07 |
| **FC425-38** | 60,4 | 2.38 |
| **FC425-40** | 64,5 | 2.54 |
| **FC425-46** | 72,6 | 2.86 |
| **FC425-54** | 84,8 | 3.34 |
| **FC425-59** | 93,0 | 3.66 |

* The maximum O.D. of hose fittings must be allowed for if fittings are to be covered.

# F2636

**Band style clamp tool**

Installation tool for FF9217 clamps. Recommended for attaching sleeve to hose lines.

# 624

**Firesleeve**

Firesleeve will protect hose from direct flame. Firesleeve is constructed of a uniform single layer of braided fiberglass tubing impregnated with flame resistant silicone rubber. Temperature range of -65°F to +500°F.

**For use with hose:**

see Accessories to hose chart pg 258 - 267

| 624 | | | |
|---|---|---|---|
| Part # | I.D. | | Clamp # |
| | **mm** | **in.** | **(2 required)** |
| **624-5** | 7,9 | 0.31 | FF9217-0622S |
| **624-7** | 11,2 | 0.44 | FF9217-0622S |
| **624-8** | 12,7 | 0.50 | FF9217-0622S |
| **624-9** | 14,2 | 0.56 | FF9217-0622S |
| **624-10** | 15,7 | 0.62 | FF9217-0622S |
| **624-11** | 17,5 | 0.69 | FF9217-0622S |
| **624-12** | 19,0 | 0.75 | FF9217-0622S |
| **624-13** | 20,6 | 0.81 | FF9217-0622S |
| **624-14** | 22,3 | 0.88 | FF9217-0622S |
| **624-16** | 25,4 | 1.00 | FF9217-0622S |
| **624-18** | 28,4 | 1.12 | FF9217-0622S |
| **624-20** | 31,7 | 1.25 | FF9217-0648S |
| **624-22** | 35,0 | 1.38 | FF9217-0648S |
| **624-24** | 38,1 | 1.50 | FF9217-0648S |
| **624-26** | 41,1 | 1.62 | FF9217-0648S |
| **624-28** | 44,4 | 1.75 | FF9217-0648S |
| **624-30** | 47,7 | 1.88 | FF9217-0648S |
| **624-32** | 50,8 | 2.00 | FF9217-0648S |
| **624-38** | 60,4 | 2.38 | FF9217-0648S |
| **624-42** | 66,5 | 2.62 | FF9217-0648S |
| **624-46** | 73,1 | 2.88 | FF9217-0664C |
| **624-50** | 79,2 | 3.12 | FF9217-0664C |
| **624-54** | 85,8 | 3.38 | FF9217-0664C |
| **624-60** | 95,2 | 3.75 | FF9217-0664C |



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# FF90754

## Guardian sleeve

Danfoss' new Guardian Sleeve is designed to provide protection against hydraulic hose failure by containing pressure and fluids that may escape during a hose burst or pinhole leak.

**For use with hose:**

see Accessories to hose chart pg 258 - 267

| FF90754 | | |
|---|---|---|
| Properties | Specification | Description |
| Burst pressure | 16,000 psi | Capable to contain hose burst up to 16,000 psi |
| Pin hole leak pressure | 4,000 psi | Sustained 4,000 psi pin hole deflection from focused 1mm pin hole |
| Abrasion cycles | 250,000 | Holds up to 250,000 abrasion cycles per ISO 6945 |

**Denier:** 1260

**Melting Point:** 215˚C/420°F

**Material:** Polyamide 6, made with pre-dyed yarn

**Dim. Stability:** Great resistance to sun, atmospheric agents and aging

**Toxicity:** Non-Toxic

**Color:** Black

**Packing Requirements:** Danfoss Guardian Sleeve comes in a 300 foot roll with no more than 3 cuts per roll and no piece shorter than 30 feet.

**Note:** must be ordered by the roll.

| General and dimensional information | | | | |
|---|---|---|---|---|
| Part # | Nominal I.D. (in) | A – Flat width (in) +/- 0.125 | Weights in lbs per 300 ft Roll | Rolls per box |
| **FF90754-68** | 0.68 | 1.290 | 7.43 | 8 |
| **FF90754-79** | 0.79 | 1.400 | 8.50 | 7 |
| **FF90754-91** | 0.91 | 1.590 | 9.70 | 6 |
| **FF90754-98** | 0.98 | 1.590 | 10.13 | 6 |
| **FF90754-106** | 1.06 | 1.825 | 11.10 | 5 |
| **FF90754-122** | 1.22 | 2.076 | 12.60 | 4 |
| **FF90754-142** | 1.42 | 2.390 | 14.50 | 4 |
| **FF90754-157** | 1.57 | 2.650 | 16.10 | 3 |
| **FF90754-173** | 1.73 | 2.910 | 17.70 | 3 |
| **FF90754-185** | 1.85 | 3.100 | 18.80 | 3 |
| **FF90754-209** | 2.09 | 3.470 | 21.10 | 2 |
| **FF90754-219** | 2.19 | 3.630 | 22.10 | 2 |
| **FF90754-238** | 2.38 | 3.925 | 23.90 | 2 |
| **FF90754-288** | 2.88 | 4.714 | 28.60 | 2 |
| **FF90754-366** | 3.66 | 5.938 | 36.10 | 1 |

| Guardian sleeve chemical compatibility | |
|---|---|
| Chemical | Compatibility |
| Gasoline | Very Good |
| Oil | Very Good |
| Mineral and vegetable oil | Very Good |
| Ionic metallic solutions | Very Good |
| Alcohols | Very Good |
| Diluted bases | Very Good |
| Diluted acids * | Good |
| Benzene | Very Good |
| Acetone | Very Good |
| Ether | Very Good |
| Carbon Tetrachloride | Very Good |
| Chlorine based solvent | Very Good |
| Mold, bacteria, moths | Very Good |

*Strong and concentrated acids; ie. Hcl or Formic acid may have some corrosive action.

| Guardian sleeve selection chart | | | |
|---|---|---|---|
| Suggested sleeve part # | Sleeve I.D. (in) | Max hose OD that sleeve can accept (in) | Hose size as a ref. |
| **FF90754-68** | 0.68 | 0.52 | -4 |
| **FF90754-79** | 0.79 | 0.61 | -4 |
| **FF90754-91** | 0.91 | 0.70 | -6 |
| **FF90754-98** | 0.98 | 0.76 | -6 |
| **FF90754-106** | 1.06 | 0.80 | -6 |
| **FF90754-122** | 1.22 | 0.92 | -8 |
| **FF90754-142** | 1.42 | 1.02 | -10 |
| **FF90754-157** | 1.57 | 1.13 | -10 |
| **FF90754-173** | 1.73 | 1.24 | -12 |
| **FF90754-185** | 1.85 | 1.34 | -16 |
| **FF90754-209** | 2.09 | 1.50 | -16 |
| **FF90754-219** | 2.19 | 1.54 | -20 |
| **FF90754-238** | 2.38 | 1.70 | -20 |
| **FF90754-288** | 2.88 | 2.00 | -24 |
| **FF90754-366** | 3.66 | 2.40 | -24 |

## Assembly Instructions

Select the correct sleeve part number for the hose.

Cut the sleeve 2 inches longer than the cut length of the hose to allow full hose bend radius.

The ends of the sleeves must be seared to prevent sleeve from fraying.

Slide the sleeve over the hose.

Properly assemble the hose ends.

Secure the sleeve over hose sockets with a metal banding product.



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# 900729
## Support clamp

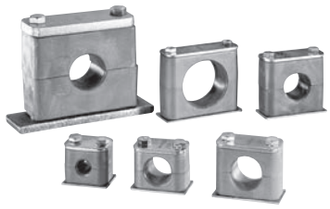
These lightweight vinyl-coated steel support clamps are designed to support hose where long runs are necessary. This clamp not only furnishes a cleaner installation, but prevents damage, exposure and chafing. The lining will withstand high ambient temperatures.

**Bolt hole dia:**
Clamp dash no. –01 thru –8, –18 thru –23 is .406; –9 thru –17, –24 thru –31 is .531.

**For use with hose:**
see Accessories to hose chart pg 258 - 267

| 900729 | | |
|---|---|---|
| Clamp dash # | Clamp I.D. Closed | |
| | **mm** | **in.** |
| -18 | 6,3 | 0.25 |
| -19 | 9,6 | 0.38 |
| -01 | 11,2 | 0.44 |
| -1 | 12,7 | 0.50 |
| -2 | 14,2 | 0.56 |
| -21 | 16,0 | 0.63 |
| -3 | 17,5 | 0.69 |
| -4 | 19,0 | 0.75 |
| -5 | 20,6 | 0.81 |
| -6 | 23,9 | 0.94 |
| -23 | 25,4 | 1.00 |
| -8 | 26,9 | 1.06 |
| -9 | 28,7 | 1.13 |
| -27 | 30,2 | 1.19 |
| -24 | 31,7 | 1.25 |
| -25 | 33,3 | 1.31 |
| -10 | 38,1 | 1.50 |
| -11 | 39,6 | 1.56 |
| -12 | 44,4 | 1.75 |
| -28 | 46,0 | 1.81 |
| -13 | 50,8 | 2.00 |
| -29 | 52,3 | 2.06 |
| -14 | 57,1 | 2.25 |
| -30 | 63,5 | 2.50 |
| -31 | 66,8 | 2.63 |
| -15 | 69,8 | 2.75 |
| -16 | 73,1 | 2.88 |
| -17 | 90,4 | 3.56 |

# FF90311
## Heavy duty hose support clamps



These heavy duty weld-based clamps are designed to securely hold hose in applications subject to impulsing, flexing and vibrating conditions. The clamps help prevent abrasion and extend hose life through proper routing. Clamps are rated to ambient temperature of +250°F.

**For use with hose:**
see Accessories to hose chart pg 258 - 267

| FF90311 | | |
|---|---|---|
| Clamp Part # | Inside diameter | |
| | **mm** | **in.** |
| **FF90311-127** | 12,7 | 0.50 |
| **FF90311-137** | 13,7 | 0.54 |
| **FF90311-150** | 15,0 | 0.59 |
| **FF90311-160** | 16,0 | 0.63 |
| **FF90311-171** | 17,1 | 0.67 |
| **FF90311-174** | 17,4 | 0.69 |
| **FF90311-190** | 19,0 | 0.75 |
| **FF90311-205** | 20,5 | 0.81 |
| **FF90311-222** | 22,2 | 0.87 |
| **FF90311-239** | 23,9 | 0.94 |
| **FF90311-254** | 25,4 | 1.00 |
| **FF90311-266** | 26,6 | 1.05 |
| **FF90311-280** | 28,0 | 1.10 |
| **FF90311-300** | 30,0 | 1.18 |
| **FF90311-320** | 32,0 | 1.26 |
| **FF90311-334** | 33,4 | 1.31 |
| **FF90311-357** | 35,7 | 1.41 |
| **FF90311-381** | 38,1 | 1.50 |
| **FF90311-400** | 40,0 | 1.57 |
| **FF90311-422** | 42,2 | 1.66 |
| **FF90311-445** | 44,5 | 1.75 |
| **FF90311-483** | 48,3 | 1.90 |
| **FF90311-508** | 50,8 | 2.00 |
| **FF90311-572** | 57,2 | 2.25 |
| **FF90311-635** | 63,5 | 2.50 |
| **FF90311-700** | 70,0 | 2.76 |



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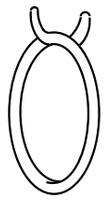
# Round-wire clamps



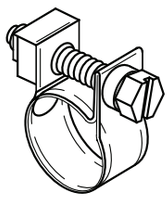
**Construction:**
Carbon steel spring wire, Zinc plated.

**Applications:**
- Industrial
- Automotive
- Agriculture
- General market applications

| Round-wire clamps | | | | | |
|---|---|---|---|---|---|
| Clamp size | Hose size | Part # | Minimum diameter | Maximum diameter | Nominal diameter |
| 06 | 1/4 | 1538 | .370 | .380 | .375 |
| 08 | 5/16 | 1539 | .551 | .573 | .562 |
| 10 | 3/8 | 1540 | .610 | .640 | .625 |

# 6207 E.F.I. hose clamps

**Electronic fuel injection hose clamps**

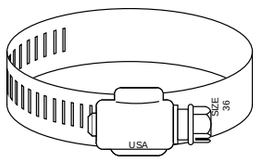


**Construction:**
Plated carbon steel
23/64' (9 mm) band width

| 6207 - E.F.I. hose clamps | | | | |
|---|---|---|---|---|
| Clamp size | Part # | Minimum diameter | Maximum diameter | Nominal diameter |
| 04 | **6207-004** | .433 | .551 | .512 |
| 05 | **6207-005** | .472 | .590 | .551 |
| 06 | **6207-006** | .551 | .669 | .630 |

# Partial stainless steel clamps

**Full-sized and micro-sized clamps**
**SAE J1508 Type F**




Partial stainless steel clamps utilize a 300 Series stainless steel band and housing with a steel case-hardened, zinc-plated screw. They feature a 14.3mm (9/16") band housing with a 8mm (5/16") hexagon and screwdriver slotted screw.

**Application:**
- Heavy-duty equipment
- Agriculture
- General industry

| 6205/6203 - Partial stainless steel clamps | | | | |
|---|---|---|---|---|
| Clamp size | Part # | Minimum diameter | Maximum diameter | Nominal diameter |
| *004 | **6205-004** | 7/32 | 5/8 | 1/4 |
| *006 | **6205-006** | 5/16 | 7/8 | 1/2 |
| 006 | **6203-006** | 3/8 | 7/8 | 1/2 |
| 008 | **6203-008** | 7/16 | 1 | 9/16 |
| 010 | **6203-010** | 9/16 | 1-1/16 | 5/8 |
| 012 | **6203-012** | 9/16 | 1-1/4 | 3/4 |
| 016 | **6203-016** | 11/16 | 1-1/2 | 1 |
| 020 | **6203-020** | 3/4 | 1-3/4 | 1-1/4 |
| 024 | **6203-024** | 1-1/16 | 2 | 1-1/2 |
| 028 | **6203-028** | 1-5/16 | 2-1/4 | 1-3/4 |
| 032 | **6203-032** | 1-9/16 | 2-1/2 | 2 |
| 036 | **6203-036** | 1-13/16 | 2-3/4 | 2-1/4 |
| 040 | **6203-040** | 2-1/16 | 3 | 2-1/2 |
| 044 | **6203-044** | 2-5/16 | 3-1/4 | 2-3/4 |
| 048 | **6203-048** | 2-9/16 | 3-1/2 | 3 |
| 052 | **6203-052** | 2-13/16 | 3-3/4 | 3-1/4 |
| 056 | **6203-056** | 3-1/16 | 4 | 3-1/2 |
| 064 | **6203-064** | 3-9/16 | 4-1/2 | 4 |
| 072 | **6203-072** | 4-1/16 | 5 | 4-1/2 |
| 080 | **6203-080** | 4-5/8 | 5-1/2 | 5 |
| 088 | **6203-088** | 4-3/32 | 6 | 5-1/2 |
| 096 | **6203-096** | 4-1/2 | 6-1/2 | 6 |
| 104 | **6203-104** | 5 | 7 | 6-1/2 |

*Micro-sized clamps



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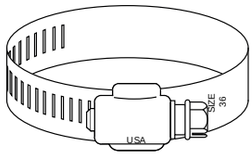
# All stainless steel clamps

**Full-sized and micro-sized clamps**
**SAE J1508 Type F**




Clamps with an all stainless steel construction offers maximum protection against corrosion.

Full-sized all stainless clamps have a 14.3mm (9/16") band and housing manufactured with 300 Series stainless steel. The 8mm (5/16") hexagon and screwdriver slotted screw features 410 stainless steel.

Micro-sized all stainless clamps have a 5/16" (8mm) band and housing manufactured with 300 Series stainless steel. The 6.35mm (1/4") hexagon and screwdriver slotted screw features 410 stainless steel.

**Applications:**

- Chemical
- Marine
- Food processing
- Dairy
- Automotive
- Electrical
- Plumbing

| All stainless steel clamps | | | | |
|---|---|---|---|---|
| Clamp size | Part # | Minimum diameter | Maximum diameter | Nominal diameter |
| *004 | **6206-004** | 7/32 | 5/8 | 1/4 |
| *006 | **6206-006** | 5/16 | 7/8 | 1/2 |
| 006 | **6204-006** | 3/8 | 7/8 | 1/2 |
| 008 | **6204-008** | 7/16 | 1 | 9/16 |
| 010 | **6204-010** | 9/16 | 1-1/16 | 5/8 |
| 012 | **6204-012** | 9/16 | 1-1/4 | 3/4 |
| 016 | **6204-016** | 11/16 | 1-1/2 | 1 |
| 020 | **6204-020** | 3/4 | 1-3/4 | 1-1/4 |
| 024 | **6204-024** | 1-1/16 | 2 | 1-1/2 |
| 028 | **6204-028** | 1-5/16 | 2-1/4 | 1-3/4 |
| 032 | **6204-032** | 1-9/16 | 2-1/2 | 2 |
| 036 | **6204-036** | 1-13/16 | 2-3/4 | 2-1/4 |
| 040 | **6204-040** | 2-1/16 | 3 | 2-1/2 |
| 044 | **6204-044** | 2-5/16 | 3-1/4 | 2-3/4 |
| 048 | **6204-048** | 2-9/16 | 3-1/2 | 3 |
| 052 | **6204-052** | 2-13/16 | 3-3/4 | 3-1/4 |
| 056 | **6204-056** | 3-1/16 | 4 | 3-1/2 |
| 064 | **6204-064** | 3-9/16 | 4-1/2 | 4 |
| 072 | **6204-072** | 4-1/16 | 5 | 4-1/2 |
| 080 | **6204-080** | 4-5/8 | 5-1/2 | 5 |
| 088 | **6204-088** | 4-3/32 | 6 | 5-1/2 |
| 096 | **6204-096** | 4-1/2 | 6-1/2 | 6 |
| 104 | **6204-104** | 5 | 7 | 6-1/2 |

*Micro-sized clamps

# A5950

**Hose bend restrictors**

For use in protecting the last section of hose at the fitting connection, bend restrictors are designed to allow for an appropriate degree of "bend" without compromising the integrity of hose assemblies. They are also recommended for hose assemblies that receive substantial handling, such as in pressure washer, air, oil, and hydraulic fluid transfer applications.

**Construction:**

Plastisol MR 436 gloss PVC

**For use with hose:**

see Accessories to hose chart pg 258 - 267

| A5950 hose bend restrictors | | |
|---|---|---|
| Restrictor I.D. (in.) | Part # | Restrictor length (in.) |
| 0.530 | **A5953** | 6 |
| 0.625 | **A5962** | 6 |
| 0.690 | **A5969** | 6 |
| 0.750 | **A5975** | 7 |
| 0.840 | **A5984** | 7 |
| 0.875 | **A5987** | 7 |



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# HP4, HP6, HP8 and HPM

## Hose protectors

Easy installation in minutes – no need to remove hose, formulated to resist solvents, oils, grease and gasoline.

| Hose protectors | |
|---|---|
| Part # | Description |
| **HP4** | 4" Hose protector case of 50 |
| **HP6** | 6" Hose protector case of 50 |
| **HP8** | 8" Hose protector case of 50 |
| **HPM** | Mixed hose protectors case of 60 |

**Features:**

- Operating temperature range is -40° to 430°F
- Exceptionally cost effective
- Packed in easy to assemble, colorful, counter display box
- Available in 3 sizes – 4", 6" and 8"– cable ties included

**Market applications:**

- Farming
- Industrial
- Trucking
- Mining
- Construction
- Aviation support
- Road maintenance
- Waste management
- Original equip. manuf.

# HLM-48

## Hose looms

| Hose looms | |
|---|---|
| Part # | Description |
| **HLM-48** | Case of 48 mixed hose looms |

**Features:**

- Prevents hose abrasion at points of contact
- Keeps multiple hoses organized
- Simplifies hose routing
- Prevents damage from unrestrained hoses
- Available in 4 sizes – 3/4", 1", 1-1/8", 1-3/8"
- Packed in colorful counter display boxes of 48
- Also available in mixed boxes of 48 (12 each size) or refill bags of 12

# HSM-48

## Hose spacers

| Hose spacers | |
|---|---|
| Part # | Description |
| **HSM-48** | Case of 48 mixed Hose Spacers |

**Features:**

- Prevents hose abrasion at points of contact
- Helps keep hoses organized
- Prevents damage from unrestrained hoses
- Available in 4 sizes – 3/4", 1", 1-1/8", 1-3/8"
- Packed in colorful counter display boxes of 48 – cable ties included
- Also available in mixed boxes of 48 (12 each size) or refill bags of 12

# FF90308

## Hose insertion gauge

Improve hose assembly reliability with these easy to use aluminum gages that are designed to ensure proper fitting depth during pre-assembly.

Simply bottom the hose in the appropriately marked cavity and scribe a mark on the hose flush with the top surface of the gauge. Insert the fitting until the back of the socket is aligned with scribe line.

| Hose insertion guage | |
|---|---|
| Part # | Usage |
| **FF90308-01** | For use with all hoses that mate with -4 through -16 1A (TTC)/Z series |
| **FF90308-02** | For use with all hoses that mate with -20 through -32 1A (TTC)/Z series |
| **FF90308-04** | For use with all hoses that mate with -06, -08, -10, -12, -16 spiral 4S/6S fittings |
| **FF90308-05** | For use with all hoses that mate with -20, -24, -32 spiral 4S/6S fittings |



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# Flaretite seals

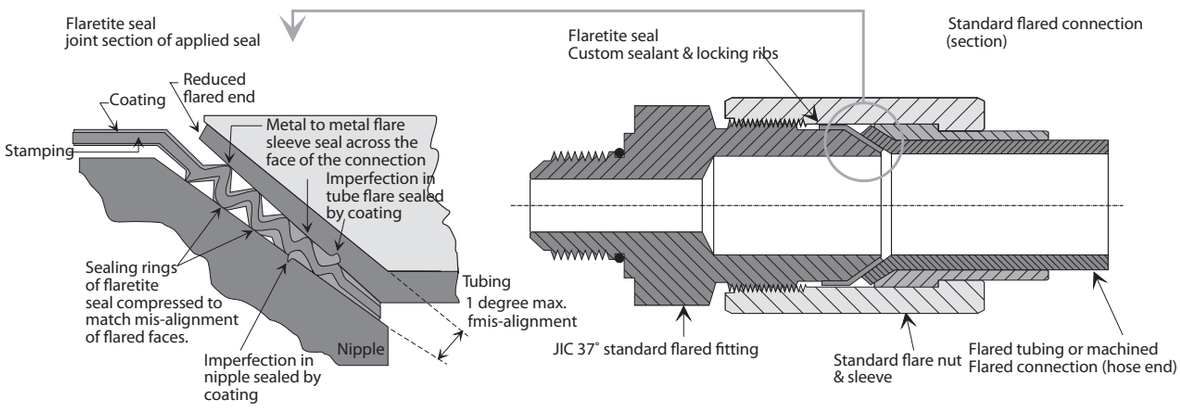
The ideal product to enhance new installations of SAE 37° connections, as well as seal off minor leaks and weeping connections.

**Features:**

- Ribbed insert design
- Coated with Loctite sealant
- Economical method to reduce minor leaks and weeping connections
- Built-in clip to attach the Flaretite seal to the nose of the SAE 37 degree connection
- Available sizes: -04 through -32

**Benefits:**

- Multiple surface contact points
- Locks the joint and fills surface imperfections
- Saves time & money associated with maintenance and rework
- Quick & easy assembly




| Flaretite seals | | |
|---|---|---|
| Seal size | Package part # | Number of seals per package |
| -04 | **FF13267** | 100 |
| -06 | **FF13268** | 100 |
| -08 | **FF13269** | 100 |
| -10 | **FF13270** | 100 |
| -12 | **FF13271** | 100 |
| -16 | **FF13272** | 50 |
| -20 | **FF13273** | 50 |
| -24 | **FF13570** | 25 |
| -32 | **FF13571** | 10 |

## Assembly and torque requirements

To assemble an SAE 37° connection using a Flaretite seal, simply push the Flaretite seal onto the male portion of the connection. The built-in clip will hold the Flaretite seal onto the male half.

During assembly ensure:

- The seal is fitted squarely to the conical nose of the JIC fitting -37° flare.
- The sealing faces of the flared connector part are clean and free of burrs.
- The flared joint is correctly tightened with recommended torque settings noted below.

| Recommended torque settings: | | | | | |
|---|---|---|---|---|---|
| Tolerance: +10% -0% | | | | | |
| -04 (1/4") | SAE 37°: 14lb-ft. | -10 (5/8") | SAE 37°: 80lb-ft. | -20 (1-1/4") | SAE 37°: 190lb-ft. |
| -06 (3/8") | SAE 37°: 26lb-ft. | -12 (3/4") | SAE 37°: 110lb-ft. | -24 (1-1/2") | SAE 37°: 220lb-ft. |
| -08 (1/2") | SAE 37°: 55lb-ft. | -16 (1") | SAE 37°: 140lb-ft. | -32 (2") | SAE 37°: 325lb-ft. |

* Flaretite is a registered trademark of Flaretite Inc.
All photos and the name Flaretite are the property of Flaretite Inc.
** Loctite is a registered trademark of the Henkel Corporation.



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## Accessories to hose chart

| Hose Part # | 900564 Steel protective coil spring* | 900705 Steel protective coil sleeve* | 900952 Plastic coil sleeve* | 222005 222022 Internal support coil | 900729 Support clamp | FF90311 Heavy duty support clamp | FC425 Nylon sleeve* | 624 Fire-sleeve* | FF9217 Band style clamp | FF90754 Guardian sleeve* | A5950 Bend restrictor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2651-4** | -1S | -1S | -6 | - | -1 | -127 | -12 | -11 | -0622S | -68 | A5950 |
| **2651-5** | -12S | -13S | -8 | - | -2 | -137 | -12 | -12 | -0622S | -79 | A5962 |
| **2651-6** | -2S | -2S | -10 | - | -21 | -171 | -16 | -14 | -0622S | -91 | A5962 |
| **2651-8** | -14S | -3S | -12 | -10C | -4 | -174 | -16 | -16 | -0622S | -106 | A5969 |
| **2651-10** | -4S | -4S | -12 | -21C | -5 | -222 | -20 | -18 | -0622S | -122 | A5984 |
| **2651-12** | -5S | -5S | -16 | -12C | -8 | -266 | -20 | -20 | -0648S | -157 | - |
| **2651-16** | -6S | -6S | -16 | - | -27 | -300 | -24 | -24 | -0648S | -173 | - |
| **2651-20** | -7S | -7S | -22 | -15C | -10 | -381 | -28 | -30 | -0648S | -209 | - |
| **2651-24** | -9S | -9S | -22 | -17C | -12 | -445 | -32 | -32 | -0648S | -238 | - |
| **2651-32** | -10S | -10S | -30 | -18C | -29 | -508 | -38 | -42 | -0648S | -366 | - |
| **2661-12** | -7S | -7S | -30 | -14C | -25 | -334 | -24 | -24 | -0648S | -219 | - |
| **2661-16** | -7S | -9S | 2 | -15C | -11 | -400 | -32 | -30 | -0648S | -288 | - |
| **2661-20** | -8S | -10S | - | -20C | -28 | -483 | -38 | -38 | -0648S | -366 | - |
| **2661-24** | -10S | -11S | - | -24C | -29 | -508 | -40 | -42 | -0648S | -366 | - |
| **2661-32** | -11S | 2 | - | - | -31 | -635 | -54 | -50 | -0664C | - | - |
| **2661-40** | - | - | - | -40C | -16 | - | -59 | -60 | -0664C | - | - |
| **2661-48** | - | - | - | -48C | -17 | - | - | - | - | - | - |
| **2807-3** | - | - | - | - | -18 | - | - | -5 | -0622S | -68 | A5953 |
| **2807-4** | - | - | - | - | -18 | - | - | -7 | -0622S | -68 | A5953 |
| **2807-5** | - | - | -4 | - | -19 | - | - | -9 | -0622S | -68 | A5953 |
| **2807-6** | - | -17S | -6 | -23C | -1 | - | - | -10 | -0622S | -68 | A5953 |
| **2807-8** | -1S | -1S | -8 | -10C | -1 | -137 | -12 | -12 | -0622S | -79 | A5962 |
| **2807-10** | -2S | -3S | -8 | -21C | -21 | -160 | -16 | -14 | -0630S | -91 | A5969 |
| **2807-12** | -2S | -3S | -10 | -13C | -4 | -190 | -16 | -16 | -0630S | -98 | A5984 |
| **2807-16** | -3S | -5S | -12 | -14C | -23 | -266 | -20 | -20 | -0630S | -157 | - |
| **2807-20** | -5S | -6S | -16 | -15C | -24 | -320 | -24 | -24 | -0648S | -185 | - |
| **2808-8** | -12S | -1S | -6 | -10C | -2 | -150 | -12 | -16 | -0622S | -79 | A5969 |
| **2808-10** | -2S | -2S | -8 | -21C | -3 | -174 | -16 | -18 | -0630S | -91 | A5975 |
| **2808-12** | -14S | -3S | -10 | -13C | -5 | -205 | -16 | -20 | -0630S | -122 | A5987 |
| **2808-16** | -5S | -5S | -16 | -14C | -8 | -280 | -20 | -26 | -0648S | -157 | - |
| **2808-20** | -7S | -6S | -16 | -15C | -25 | -334 | -24 | -32 | -0648S | -209 | - |
| **2808-24** | -7S | -7S | -22 | -17C | -11 | -422 | -28 | -38 | -0648S | -238 | - |
| **3TR7-02** | - | - | -6 | - | -18 | - | -12 | - | -0622S | -68 | A5953 |
| **3TR7-03** | - | - | -8 | - | -19 | - | -12 | - | -0622S | -79 | A5953 |
| **3TR7-04** | - | - | -10 | - | -01 | - | -12 | - | -0622S | -79 | A5953 |
| **3TR7-05** | - | - | -10 | - | -2 | -137 | -16 | - | -0622S | -91 | A5962 |
| **3TR7-06** | - | - | -12 | - | -21 | -160 | -16 | - | -0622S | -98 | A5969 |
| **3TR7-08** | - | - | -12 | - | -5 | -205 | -16 | - | -0622S | -142 | A5987 |
| **3TR7-10** | - | - | -16 | - | -5 | -222 | -18 | - | -0622S | -157 | - |

*Sizes indicated are based on Hose O.D. only. If sleeve is to be placed over fittings, a larger sleeve size may be required, depending on type of fitting used.



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## Accessories to hose chart

| Hose Part # | 900564 | 900705 | 900952 | 222005 222022 | 900729 | FF90311 | FC425 | 624 | FF9217 | FF90754 | A5950 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Steel protective coil spring*** | **Steel protective coil sleeve*** | **Plastic coil sleeve*** | **Internal support coil** | **Support clamp** | **Heavy duty support clamp** | **Nylon sleeve*** | **Fire-sleeve*** | **Band style clamp** | **Guardian sleeve*** | **Bend restrictor** |
| | | | | | | | | | | | |
| **3TR7-12** | - | - | -16 | - | -23 | -254 | -20 | - | -0648S | -173 | - |
| **3TR7-16** | - | - | -22 | - | -25 | -334 | -24 | - | -0648S | -209 | - |
| **3TR7N-02** | - | - | -6 | - | -18 | - | -12 | - | -0622S | -68 | A5953 |
| **3TR7N-03** | - | - | -8 | - | -19 | - | -12 | - | -0622S | -79 | A5953 |
| **3TR7N-04** | - | - | -10 | - | -01 | - | -12 | - | -0622S | -79 | A5953 |
| **3TR7N-05** | - | - | -10 | - | -2 | -137 | -16 | - | -0622S | -91 | A5962 |
| **3TR7N-06** | - | - | -12 | - | -21 | -160 | -16 | - | -0622S | -98 | A5969 |
| **3TR7N-08** | - | - | -12 | - | -5 | -205 | -16 | - | -0622S | -142 | A5987 |
| **3TR7N-10** | - | - | -16 | - | -5 | -222 | -18 | - | -0622S | -157 | - |
| **3TR7N-12** | - | - | -16 | - | -23 | -254 | -20 | - | -0648S | -173 | - |
| **3TR7N-16** | - | - | -22 | - | -25 | -334 | -24 | - | -0648S | -209 | - |
| **3TR8-04** | - | - | -10 | - | -2 | -150 | -16 | - | -0622S | -98 | A5969 |
| **3TR8-06** | - | - | -12 | - | -3 | -174 | -16 | - | -0622S | -106 | A5984 |
| **3TR8-08** | - | - | -16 | - | -5 | -222 | -18 | - | -0622S | -142 | - |
| **3TR8-12** | - | - | -22 | - | -8 | -280 | -20 | - | -0648S | -173 | - |
| **3TR8-16** | - | - | -30 | - | -25 | -357 | -24 | - | -0648S | -219 | - |
| **3TR8N-04** | - | - | -10 | - | -2 | -150 | -16 | - | -0622S | -98 | A5969 |
| **3TR8N-06** | - | - | -12 | - | -3 | -174 | -16 | - | -0622S | -106 | A5984 |
| **3TR8N-08** | - | - | -16 | - | -5 | -222 | -18 | - | -0622S | -142 | - |
| **3TR8N-12** | - | - | -22 | - | -8 | -280 | -20 | - | -0648S | -173 | - |
| **3TR8N-16** | - | - | -30 | - | -25 | -357 | -24 | - | -0648S | -219 | - |
| **3TR18CT-04** | - | - | -8 | - | -01 | - | -12 | - | -0622S | -79 | A5953 |
| **3TR18CT-05** | - | - | -10 | - | -2 | -137 | -16 | - | -0622S | -91 | A5962 |
| **3TR18CT-06** | - | - | -12 | - | -21 | -160 | -16 | - | -0622S | -98 | A5969 |
| **3TR18CT-08** | - | - | -16 | - | -5 | -205 | -16 | - | -0622S | -142 | A5987 |
| **3TR18CT-10** | - | - | -16 | - | -23 | -266 | -20 | - | -0648S | -173 | - |
| **CR170-06** | -2S | -2S | -10 | - | -21 | - | -16 | -14 | -0622S | -91 | A5975 |
| **CR170-08** | -14S | -3S | -12 | -10C | -4 | - | -16 | -16 | -0622S | -106 | A5984 |
| **CR170-12** | -5S | -14S | -16 | -12C | -8 | - | -20 | -20 | -0648S | -157 | - |
| **EC115-04** | -1S | -1S | -6 | - | -1 | -127 | -15 | -11 | -0622S | -68 | A5962 |
| **EC115-06** | -1S | -13S | -8 | - | -2 | -150 | -16 | -12 | -0622S | -79 | A5969 |
| **EC115-08** | -3S | -4S | -12 | -10C | -4 | -190 | -18 | -12 | -0622S | -98 | A5984 |
| **EC115-10** | -3S | -3S | -12 | -21C | -5 | -205 | -24 | -16 | -0622S | -122 | - |
| **EC115-12** | -4S | -5S | -16 | - | -6 | -239 | -24 | -20 | -0630S | -142 | - |
| **EC115-16** | -5S | -6S | -16 | -13C | -9 | -320 | -32 | -20 | -0630S | -173 | - |
| **EC115-20** | -7S | -7S | -22 | -14C | -11 | -400 | -38 | -30 | -0648S | -238 | - |

*Sizes indicated are based on Hose O.D. only. If sleeve is to be placed over fittings, a larger sleeve size may be required, depending on type of fitting used.



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## Accessories to hose chart

| Hose Part # | 900564<br>Steel protective coil spring* | 900705<br>Steel protective coil sleeve* | 900952<br>Plastic coil sleeve* | 222005<br>222022<br>Internal support coil | 900729<br>Support clamp | FF90311<br>Heavy duty support clamp | FC425<br>Nylon sleeve* | 624<br>Fire-sleeve* | FF9217<br>Band style clamp | FF90754<br>Guardian sleeve* | A5950<br>Bend restrictor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EC115-24** | -8S | -10S | -30 | -17C | -12 | -483 | -40 | -32 | -0664C | -288 | - |
| **EC115-32** | -13S | -12S | -30 | -19C | -30 | -635 | -54 | -46 | -0664C | -366 | - |
| **EC116-04** | -1S | -17S | -8 | - | -19 | -127 | -12 | -7 | -0622S | -68 | A5962 |
| **EC116-05** | -1S | -17S | -8 | - | -01 | -127 | -12 | -8 | -0622S | -68 | A5962 |
| **EC116-06** | -1S | -13S | -10 | - | -2 | -150 | -12 | -10 | -0622S | -79 | A5975 |
| **EC116-08** | -12S | -3S | -12 | - | -3 | -174 | -12 | -12 | -0622S | -91 | A5984 |
| **EC118-04** | -1S | -1S | -10 | - | -01 | - | -12 | -9 | -0622S | -79 | A5962 |
| **EC118-05** | -1S | -13S | -10 | -23C | -1 | -137 | -12 | -10 | -0622S | -91 | A5969 |
| **EC118-06** | -12S | -3S | -12 | -10C | -21 | -160 | -16 | -12 | -0622S | -98 | A5975 |
| **EC118-08** | -15S | -4S | -12 | -21C | -4 | -190 | -16 | -14 | -0622S | -122 | A5962 |
| **EC118-10** | -4S | -5S | -16 | -12C | -6 | -239 | -18 | -18 | -0622S | -157 | - |
| **EC118-12** | -5S | -6S | -22 | - | -9 | -280 | -24 | -22 | -0648S | -185 | - |
| **EC118-16** | -7S | -7S | -30 | - | -25 | -357 | -28 | -26 | -0648S | -219 | - |
| **EC215-04** | -1S | -1S | -6 | - | -1 | -127 | -12 | -11 | -0622S | -68 | A5962 |
| **EC215-06** | -2S | -2S | -10 | - | -3 | -174 | -16 | -14 | -0622S | -91 | A5984 |
| **EC215-08** | -15S | -3S | -10 | - | -5 | -205 | -16 | -16 | -0622S | -122 | A5987 |
| **EC215-10** | -4S | -4S | -12 | -21C | -6 | -239 | -20 | -18 | -0630S | -122 | - |
| **EC215-12** | -4S | -4S | -12 | - | -6 | - | -20 | -18 | -0633S | -157 | - |
| **EC215-16** | -7S | -6S | -16 | - | -25 | -357 | -24 | -24 | -0630S | -209 | - |
| **EC215-20** | -7S | -9S | -22 | - | -12 | -422 | -28 | -28 | -0648S | -288 | - |
| **EC215-24** | -8S | -8S | -30 | - | -13 | -508 | -38 | -38 | -0648S | -288 | - |
| **EC215-32** | -13S | -12S | -30 | - | -30 | -635 | -46 | -46 | -0664C | - | - |
| **EC216-04** | -1S | -17S | -8 | - | -01 | -127 | -12 | -8 | -0622S | -68 | A5962 |
| **EC216-05** | -1S | -1S | -10 | - | -1 | -137 | -12 | -9 | -0622S | -79 | A5969 |
| **EC216-06** | -1S | -2S | -10 | - | -2 | -160 | -12 | -11 | -0622S | -91 | A5984 |
| **EC216-08** | -2S | -3S | -12 | - | -4 | -190 | -12 | -13 | -0622S | -98 | A5987 |
| **EC230-40** | - | - | - | -40C | -16 | -700 | -54 | -54 | -0664C | - | - |
| **EC415-06** | -3S | -3S | -12 | - | -5 | - | -18 | -18 | -0622S | -122 | - |
| **EC415-08** | -4S | -4S | -12 | - | -6 | -239 | -20 | -18 | -0630S | -122 | - |
| **EC415-10** | -4S | -4S | -12 | - | -6 | - | -20 | -18 | -0633S | -157 | - |
| **EC415-12** | -6S | -14S | -16 | - | -27 | -300 | -24 | -22 | -0648S | -173 | - |
| **EC415-16** | -7S | -7S | -22 | - | -10 | -381 | -28 | -30 | -0648S | -209 | - |
| **EC415-20** | -8S | -9S | -22 | - | -28 | -445 | -32 | -38 | -0648S | -288 | - |
| **EC615-20** | -8S | -8S | -30 | - | -13 | -508 | -38 | -38 | -0648S | -288 | - |
| **EC615-24** | -10S | -10S | -30 | - | -14 | -572 | -38 | -38 | -0648S | -366 | - |
| **EC810-12** | -6S | -6S | -16 | - | -24 | -320 | -24 | -26 | -0648S | -185 | - |
| **EC810-16** | -7S | -7S | -22 | - | -10 | -381 | -28 | -28 | -0648S | -209 | - |

*Sizes indicated are based on Hose O.D. only. If sleeve is to be placed over fittings, a larger sleeve size may be required, depending on type of fitting used.



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| Hose Part # | 900564 Steel protective coil spring* | 900705 Steel protective coil sleeve* | 900952 Plastic coil sleeve* | 222005 222022 Internal support coil | 900729 Support clamp | FF90311 Heavy duty support clamp | FC425 Nylon sleeve* | 624 Fire-sleeve* | FF9217 Band style clamp | FF90754 Guardian sleeve* | A5950 Bend restrictor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| **EC810-20** | -8S | -8S | -30 | - | -13 | -508 | -38 | -38 | -0648S | -288 | - |
| **EC810-24** | -10S | -10S | -30 | - | -14 | -572 | -38 | -38 | -0648S | -366 | - |
| **EC810-32** | -11S | -11S | -30 | - | -15 | -700 | -54 | -46 | -0664C | - | - |
| **EC881-4** | -1S | -1S | -8 | -21C | -01 | - | -12 | -9 | -0622S | -79 | A5962 |
| **EC881-6** | -1S | -2S | -10 | -11C | -2 | -137 | -16 | -11 | -0622S | -91 | A5975 |
| **EC881-8** | -2S | -3S | -12 | -12C | -21 | -160 | -16 | -12 | -0622S | -98 | A5987 |
| **EC881-10** | -15S | -4S | -12 | - | -4 | -190 | -16 | -14 | -0622S | -122 | - |
| **EC881-12** | -3S | -5S | -16 | -14C | -5 | -222 | -18 | -18 | -0622S | -142 | - |
| **EC881-16** | -5S | -6S | -22 | -15C | -9 | -280 | -24 | -22 | -0648S | -185 | - |
| **EC881-20** | -9S | -8S | - | -18C | -11 | -422 | -32 | -30 | -0648S | -288 | - |
| **EC881-24** | -8S | -10S | - | - | -13 | -508 | -38 | -38 | -0648S | -366 | - |
| **EC881-32** | -13S | -11S | - | -40C | -30 | -635 | -46 | -46 | -0664C | - | - |
| **EC850-10** | -5S | -14S | -22 | -12C | -8 | -266 | -20 | -20 | -0648S | -173 | - |
| **EC850-12** | -6S | -7S | -22 | -14C | -27 | -300 | -24 | -22 | -0648S | -209 | - |
| **EC850-16** | -7S | -9S | -30 | -15C | -10 | -381 | -28 | -28 | -0648S | -238 | - |
| **EC850-20** | -8S | -10S | - | -17C | -28 | -483 | -38 | -38 | -0648S | -366 | - |
| **EC910-8** | -4S | -5S | -16 | -21C | -6 | -239 | -20 | -20 | -0648S | -157 | - |
| **EC910-12** | -6S | -7S | -22 | -14C | -24 | -320 | -24 | -24 | -0648S | -209 | - |
| **EC910-16** | -7S | -9S | -30 | -15C | -10 | -381 | -28 | -28 | -0648S | -288 | - |
| **FC234-05** | -1S | -2S | -10 | -23C | -2 | -137 | -16 | -11 | -0622S | -91 | A5962 |
| **FC234-06** | -2S | -3S | -12 | -23C | -21 | -171 | -16 | -12 | -0622S | -98 | A5975 |
| **FC234-08** | -15S | -4S | -12 | -10C | -4 | -190 | -16 | -14 | -0622S | -122 | A5984 |
| **FC234-10** | -4S | -5S | -16 | -21C | -23 | -239 | -16 | -13 | -0622S | -122 | - |
| **FC234-12** | -5S | -14S | -16 | -13C | -9 | -280 | -20 | -16 | -0630S | -157 | - |
| **FC234-16** | -6S | -7S | -22 | -14C | -24 | -320 | -20 | -20 | -0630S | -173 | - |
| **FC250H-04** | -1S | -1S | -8 | - | -01 | - | -12 | -8 | -0622S | -68 | A5953 |
| **FC250H-06** | -1S | -13S | -10 | - | -2 | -137 | -12 | -10 | -0622S | -79 | A5962 |
| **FC250H-08** | -12S | -3S | -12 | -10C | -21 | -160 | -12 | -12 | -0622S | -91 | A5975 |
| **FC250H-10** | -15S | -4S | -12 | -21C | -4 | -190 | -16 | -13 | -0622S | -106 | A5984 |
| **FC250H-12** | -3S | -5S | -16 | -12C | -5 | -222 | -16 | -16 | -0622S | -122 | - |
| **FC250H-16** | -5S | -6S | -22 | --14C | -9 | -280 | -20 | -20 | -0648S | -173 | - |
| **FC254-08** | -4S | -4S | -12 | - | -6 | -254 | -20 | -18 | -0630S | -142 | - |
| **FC254-12** | -6S | -6S | -16 | - | -24 | -320 | -24 | -26 | -0648S | -173 | - |
| **FC254-16** | -7S | -7S | -22 | - | -10 | -381 | -28 | -30 | -0648S | -209 | - |
| **FC254-20** | -8S | -9S | -22 | - | -28 | -445 | -32 | -32 | -0648S | -288 | - |
| **FC254-24** | -10S | -10S | -30 | - | -29 | - | -38 | -38 | -0648S | -366 | - |
| **FC254-32** | -10S | -11S | -30 | - | -31 | -700 | -54 | -46 | -0664C | - | - |
| **FC273B-12** | -6S | -14S | -16 | - | -27 | -300 | -24 | -22 | -0648S | -173 | - |
| **FC273B-16** | -7S | -7S | -22 | - | -10 | -381 | -28 | -30 | -0648S | -209 | - |
| **FC273B-20** | -8S | -8S | -30 | - | -13 | -508 | -38 | -38 | -0648S | -288 | - |

*Sizes indicated are based on Hose O.D. only. If sleeve is to be placed over fittings, a larger sleeve size may be required, depending on type of fitting used.



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## Accessories to hose chart

| Hose Part # | 900564<br>Steel protective coil spring* | 900705<br>Steel protective coil sleeve* | 900952<br>Plastic coil sleeve* | 222005<br>222022<br>Internal support coil | 900729<br>Support clamp | FF90311<br>Heavy duty support clamp | FC425<br>Nylon sleeve* | 624<br>Fire-sleeve* | FF9217<br>Band style clamp | FF90754<br>Guardian sleeve* | A5950<br>Bend restrictor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **FC273B-24** | -10S | -10S | -30 | - | -14 | -572 | -38 | -38 | -0648S | -366 | - |
| **FC273B-32** | -11S | -11S | -30 | - | -15 | -700 | -54 | -46 | -0664C | - | - |
| **FC300-04** | -1S | -1S | -6 | - | -1 | -137 | -12 | -11 | -0622S | -79 | A5962 |
| **FC300-05** | -12S | -13S | -8 | - | -2 | - | -12 | -12 | -0622S | -79 | A5969 |
| **FC300-06** | -2S | -2S | -10 | - | -21 | -174 | -16 | -14 | -0622S | -91 | A5975 |
| **FC300-08** | -14S | -3S | -12 | -10C | -4 | -190 | -16 | -16 | -0622S | -98 | A5984 |
| **FC300-10** | -4S | -4S | -12 | -21C | -6 | -239 | -20 | -18 | -0630S | -142 | - |
| **FC300-12** | -5S | -5S | -16 | -13C | -8 | -280 | -20 | -20 | -0630S | -157 | - |
| **FC300-16** | -6S | -6S | -16 | -14C | -27 | -320 | -24 | -24 | -0648S | -185 | - |
| **FC300-20** | -7S | -7S | -22 | -15C | -10 | -381 | -28 | -30 | -0648S | -209 | - |
| **FC300-24** | -9S | -9S | -22 | -17C | -12 | -445 | -32 | -32 | -0648S | -238 | - |
| **FC300-32** | -10S | -10S | -30 | -18C | -14 | -572 | -38 | -38 | -0648S | -366 | - |
| **FC300-40** | - | -12S | - | -19C | -16 | - | - | - | - | - | - |
| **FC321-04** | -1S | -1S | -6 | - | -1 | -137 | -12 | -11 | -0622S | -79 | A5962 |
| **FC321-05** | -12S | -13S | -8 | - | -2 | -150 | -12 | -12 | -0622S | -79 | A5969 |
| **FC321-06** | -2S | -2S | -10 | - | -21 | -174 | -16 | -14 | -0622S | -91 | A5975 |
| **FC321-08** | -14S | -3S | -12 | -10C | -4 | -190 | -16 | -16 | -0622S | -122 | A5984 |
| **FC321-10** | -4S | -4S | -12 | -11C | -5 | -239 | -20 | -18 | -0630S | -122 | - |
| **FC321-12** | -5S | -5S | -16 | -13C | -8 | -280 | -20 | -20 | -0630S | -157 | - |
| **FC321-16** | -6S | -6S | -16 | -14C | -27 | -320 | -24 | -22 | -0630S | -173 | - |
| **FC332-04** | -1S | -1S | -6 | - |  | -127 | -12 | -9 | -0622S | -68 | A5962 |
| **FC332-06** | -12S | -13S | -8 | - | -21 | -160 | -16 | -11 | -0622S | -91 | A5969 |
| **FC332-08** | -14S | -3S | -10 | - | -4 | -190 | -16 | -13 | -0622S | -98 | A5984 |
| **FC332-10** | -3S | -4S | -12 | - | -5 | -222 | -20 | -16 | -0622S | -122 | - |
| **FC332-12** | -5S | -5S | -12 | - | -23 | -266 | -20 | -18 | -0630S | -157 | - |
| **FC350-04** | -1S | -1S | -6 | - | -1 | -127 | -12 | -11 | -0622S | -79 | A5962 |
| **FC350-05** | -12S | -13S | -8 | - | -2 | -150 | -12 | -12 | -0622S | -79 | A5969 |
| **FC350-06** | -2S | -2S | -10 | - | -21 | -174 | -16 | -14 | -0622S | -91 | A5975 |
| **FC350-08** | -14S | -3S | -12 | -10C | -4 | -190 | -16 | -16 | -0622S | -106 | A5984 |
| **FC350-10** | 0 | -4S | -12 | -21C | -6 | -239 | -20 | -18 | -0630S | -142 | - |
| **FC350-12** | -5S | -5S | -5 | -13C | -8 | -280 | -20 | -20 | -0630S | -157 | - |
| **FC350-16** | -6S | -6S | -16 | -14C | -27 | -320 | -24 | -24 | -0648S | -173 | - |
| **FC350-20** | -7S | -7S | -22 | -15C | -10 | -381 | -28 | -30 | -0648S | -209 | - |
| **FC350-24** | -9S | -9S | -22 | -17C | -12 | -445 | -32 | -32 | -0648S | -288 | - |
| **FC355-04** | -1S | -1S | -6 | - | -1 | -127 | -12 | -11 | -0622S | -79 | A5962 |
| **FC355-05** | -1S | -2S | -6 | - | -1 | -150 | -12 | -11 | -0622S | -91 | A5969 |
| **FC355-06** | -12S | -1S | -8 | - | -2 | -174 | -12 | -12 | -0622S | -91 | A5975 |
| **FC355-08** | -2S | -13S | -10 | - | -3 | -190 | -16 | -12 | -0622S | -106 | A5984 |
| **FC355-10** | -3S | -3S | -12 | -10C | -5 | -239 | -16 | -13 | -0622S | -142 | - |
| **FC355-12** | -4S | -5S,-4S | -6 | -21C | -6 | -280 | -20 | -16 | -0630S | -157 | - |

*Sizes indicated are based on Hose O.D. only. If sleeve is to be placed over fittings, a larger sleeve size may be required, depending on type of fitting used.



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## Accessories to hose chart

| Hose Part # | 900564 Steel protective coil spring* | 900705 Steel protective coil sleeve* | 900952 Plastic coil sleeve* | 222005 222022 Internal support coil | 900729 Support clamp | FF90311 Heavy duty support clamp | FC425 Nylon sleeve* | 624 Fire-sleeve* | FF9217 Band style clamp | FF90754 Guardian sleeve* | A5950 Bend restrictor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| **FC355-16** | -5S | -6S | -16 | -13C | -9 | -320 | -20 | -20 | -0630S | -173 | - |
| **FC355-20** | -6S | -7S | -22 | -14C | -24 | -381 | -24 | -22 | -0648S | -219 | - |
| **FC355-24** | -7S | -7S | -22 | -15C | -10 | -445 | -28 | -30 | -0648S | -288 | - |
| **FC355-32** | -9S | -9S | -22 | -17C | -12 | -572 | -32 | -32 | -0648S | -366 | - |
| **FC466-04** | -1S | -1S | -6 | - | -1 | -127 | -12 | -9 | -0622S | -68 | A5962 |
| **FC466-06** | -12S | -13S | -8 | - | -21 | -160 | -16 | -11 | -0622S | -91 | A5975 |
| **FC466-08** | -14S | -3S | -10 | - | -4 | -190 | -16 | -13 | -0622S | -98 | A5984 |
| **FC466-10** | -3S | -4S | -12 | - | -5 | -222 | -20 | -16 | -0622S | -122 | - |
| **FC498/FC598-04** | -1S | -1S | -6 | - | - | -127 | -12 | -9 | -0622S | -68 | A5962 |
| **FC498/FC598-06** | -12S | -13S | -8 | - | -21 | -160 | -16 | -11 | -0622S | -91 | A5969 |
| **FC498/FC598-08** | -14S | -3S | -10 | - | -4 | -190 | -16 | -13 | -0622S | -98 | A5984 |
| **FC498/FC598-10** | -3S | -4S | -12 | - | -5 | -222 | -20 | -16 | -0622S | -122 | - |
| **FC498/FC598-12** | -5S | -5S | -12 | - | -23 | -266 | -20 | -18 | -0630S | -157 | - |
| **FC500-12** | -7S | -14S | -16 | - | -27 | -300 | -24 | -22 | -0648S | -173 | - |
| **FC500-16** | -9S | -7S | -22 | - | -10 | -381 | -32 | -26 | -0648S | -209 | - |
| **FC500-20** | -10S | -8S | -22 | - | -28 | - | -38 | -32 | -0648S | -288 | - |
| **FC500-24** | -10S | -10S | -30 | - | -13 | - | -40 | -36 | -0648S | -366 | - |
| **FC500-32** | -8S | -11S | -30 | - | -15 | -700 | -54 | -48 | -0664C | - | - |
| **FC510-04** | -12S | -1S | -6 | - | -2 | -137 | -12 | -12 | -0622S | -79 | A5962 |
| **FC510-06** | -14S | -2S | -10 | - | -4 | -174 | -12 | -16 | -0622S | -91 | A5975 |
| **FC510-08** | -3S | -3S | -12 | - | -5 | -205 | -16 | -16 | -0630S | -106 | A5984 |
| **FC510-10** | -5S | -4S | -12 | - | -6 | -239 | -20 | -18 | -0630S | -142 | - |
| **FC510-12** | -6S | -5S | -16 | - | -8 | -280 | -24 | -20 | -0630S | -157 | - |
| **FC510-16** | -9S | -6S | -16 | - | -25 | -357 | -28 | -24 | -0648S | -209 | - |
| **FC510-20** | -9S | -8S | -30 | - | -12 | -422 | -32 | -30 | -0648S | -238 | - |
| **FC579-04** | -1S | -13S | -10 | -23C | -1 | -137 | -12 | -11 | -0622S | -91 | A5962 |
| **FC579-06** | -15S | -4S | -12 | -10C | -4 | -190 | -16 | -14 | -0622S | -122 | A5984 |
| **FC606-16** | -7S | -9S | - | -15C | -11 | -400 | -32 | -30 | -0648S | -288 | - |
| **FC606-20** | -8S | -10S | - | -20C | -28 | -483 | -38 | -38 | -0648S | -366 | - |
| **FC606-24** | -10S | -11S | - | -24C | -29 | -508 | -40 | -42 | -0648S | -366 | - |
| **FC611-08** | -3S | -5S | -16 | -21C | -5 | -222 | -18 | -18 | -0622S | -142 | A5987 |
| **FC611-12** | -5S | -14S | -22 | -14C | -8 | -266 | -20 | -20 | -0648S | -173 | - |
| **FC611-16** | -7S | -7S | -30 | -15C | -25 | -334 | -24 | -26 | -0648S | -219 | - |
| **FC611-20** | -9S | -8S | - | -20C | -11 | -422 | -32 | -30 | -0648S | -288 | - |
| **FC611-24** | -8S | -10S | - | -24C | -28 | -483 | -38 | -38 | -0648S | -366 | - |
| **FC611-32** | -13S | -11S | - | - | -30 | -635 | -46 | -46 | -0664C | - | - |
| **FC619-12** | -6S | -6S | -22 | -14C | -9 | -280 | -24 | -22 | -0648S | -185 | - |
| **FC619-16** | -7S | -7S | -30 | -15C | -25 | -357 | -28 | -26 | -0648S | -219 | - |
| **FC619-20** | -9S | -8S | - | -20C | -12 | -445 | -32 | -32 | -0648S | -288 | - |
| **FC619-24** | -8S | -10S | - | -24C | -13 | -508 | -38 | -38 | -0648S | -366 | - |

*Sizes indicated are based on Hose O.D. only. If sleeve is to be placed over fittings, a larger sleeve size may be required, depending on type of fitting used.



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## Accessories to hose chart

| Hose Part # | 900564 Steel protective coil spring* | 900705 Steel protective coil sleeve* | 900952 Plastic coil sleeve* | 222005 222022 Internal support coil | 900729 Support clamp | FF90311 Heavy duty support clamp | FC425 Nylon sleeve* | 624 Fire-sleeve* | FF9217 Band style clamp | FF90754 Guardian sleeve* | A5950 Bend restrictor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **FC619-32** | -13S | -11S | - | - | -30 | -635 | -46 | -46 | -0664C | - | - |
| **FC619-40** | - | - | - | -40C | -16 | -700 | -54 | -54 | -0664C | - | - |
| **FC619-48** | - | - | - | -48C | -17 | - | - | - | - | - | - |
| **FC636-12** | -6S | -6S | -22 | -14C | -27 | -300 | -24 | -22 | -0648S | -185 | - |
| **FC636-16** | -7S | -9S | -30 | - | -25 | -357 | -28 | -26 | -0648S | -219 | - |
| **FC636-20** | -9S | -8S | - | -20C | -28 | -445 | -32 | -32 | -0648S | -288 | - |
| **FC636-24** | -8S | -10S | - | -24C | -29 | -508 | -38 | -38 | -0648S | -366 | - |
| **FC639-06** | -2S | -2S | -10 | - | -3 | -174 | -16 | -14 | -0622S | -91 | A5975 |
| **FC639-08** | -15S | -3S | -10 | - | -5 | -205 | -16 | -16 | -0622S | -122 | A5987 |
| **FC639-10** | -4S | -5S | -16 | - | -6 | -239 | -20 | -20 | -0630S | -142 | - |
| **FC639-12** | -5S | -6S | -16 | -14C | -9 | -280 | -22 | -22 | -0648S | -173 | - |
| **FC639-16** | -7S | -7S | -22 | -15C | -10 | -357 | -24 | -28 | -0648S | -209 | - |
| **FC647-04** | -1S | -1S | -6 | - | -1 | -127 | -12 | -9 | -0622S | -68 | A5962 |
| **FC647-06** | -12S | -13S | -8 | - | -21 | -160 | -16 | -11 | -0622S | -91 | A5969 |
| **FC647-08** | -14S | -3S | -10 | - | -4 | -190 | -16 | -13 | -0622S | -106 | A5984 |
| **FC647-10** | -3S | -4S | -12 | - | -5 | -222 | -20 | -16 | -0622S | -122 | - |
| **FC647-12** | -5S | -5S | -12 | - | -23 | -266 | -20 | -18 | -0630S | -157 | - |
| **FC650-04** | -1S | -1S | -6 | - | -1 | - | -12 | -11 | -0622S | -68 | A5953 |
| **FC650-06** | -2S | -2S | -10 | - | -21 | -160 | -16 | -14 | -0622S | -91 | A5969 |
| **FC650-08** | -14S | -3S | -12 | -10C | -4 | -190 | -16 | -16 | -0622S | -98 | A5984 |
| **FC650-10** | -3S | -3S | -12 | - | -5 | -205 | -16 | -16 | -0622S | -122 | A5987 |
| **FC650-12** | -4S | -5S | -16 | - | -6 | -254 | -20 | -20 | -0630S | -142 | - |
| **FC693-04** | -1S | -13S | -8 | - | -2 | - | -12 | -12 | 0622S | -79 | A5969 |
| **FC693-06** | -1S | -2S | -10 | - | -4 | - | -16 | -16 | -0622S | -98 | A5984 |
| **FC693-08** | -3S | -3S | -12 | - | -5 | - | -18 | -18 | -0622S | -122 | - |
| **FC699-04** | -12S | -1S | -6 | - | -2 | - | -12 | -12 | -0622S | -68 | A5962 |
| **FC699-06** | -14S | -2S | -10 | - | -4 | -174 | -16 | -16 | -0622S | -91 | A5969 |
| **FC699-08** | -3S | -3S | -12 | - | -5 | -205 | -16 | -16 | -0630S | -106 | A5984 |
| **FC699-10** | -4S | -4S | -12 | - | -6 | -239 | -20 | -18 | -0630S | -142 | - |
| **FC699-12** | -5S | -5S | -16 | - | -8 | -280 | -20 | -22 | -0630S | -157 | - |
| **FC735-04** | -1S | -1S | -6 | - | -1 | -127 | -12 | -11 | -0622S | -68 | A5962 |
| **FC735-06** | -2S | -2S | -10 | - | -3 | -171 | -16 | -16 | -0622S | -91 | A5975 |
| **FC735-08** | -15S | -3S | -10 | - | -5 | -205 | -16 | -16 | -0622S | -122 | A5987 |
| **FC735-10** | -4S | -4S | -12 | - | -6 | -254 | -20 | -18 | -0630S | -142 | - |
| **FC735-12** | -5S | -14S | -16 | - | -9 | -280 | -24 | -22 | -0648S | -173 | - |
| **FC735-16** | -7S | -7S | -22 | -15C | -10 | -357 | -24 | -28 | -0648S | -185 | - |
| **FC735-20** | -7S | -9S | -22 | - | -12 | -422 | -28 | -28 | -0648S | -288 | - |
| **FC736-06** | -3S | -3S | -12 | - | -5 | -205 | -16 | -16 | -0630S | -122 | - |
| **FC736-08** | -4S | -4S | -12 | - | -6 | -239 | -20 | -18 | -0630S | -142 | - |
| **FC736-10** | -5S | -5S | -16 | - | -8 | -280 | -20 | -20 | -0630S | -157 | - |

*Sizes indicated are based on Hose O.D. only. If sleeve is to be placed over fittings, a larger sleeve size may be required, depending on type of fitting used.



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## Accessories to hose chart

| Hose Part # | 900564 | 900705 | 900952 | 222005 222022 | 900729 | FF90311 | FC425 | 624 | FF9217 | FF90754 | A5950 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Steel protective coil spring*** | **Steel protective coil sleeve*** | **Plastic coil sleeve*** | **Internal support coil** | **Support clamp** | **Heavy duty support clamp** | **Nylon sleeve*** | **Fire-sleeve*** | **Band style clamp** | **Guardian sleeve*** | **Bend restrictor** |
| | | | | | | | | | | | |
| **FC736-12** | -6S | -6S | -16 | - | -24 | -300 | -24 | -26 | -0630S | -209 | - |
| **FC736-16** | -7S | -7S | -22 | - | -11 | -381 | -28 | -28 | -0630S | -288 | - |
| **FC736-20** | -8S | -8S | -22 | - | -28 | - | -32 | -30 | -0648S | -288 | - |
| **FC800-12** | -6S | -14S | -16 | -12C | -9 | -266 | -18 | -18 | -0622S | -157 | - |
| **FC800-16** | -7S | -7S | -22 | -13C | -10 | -300 | -24 | -22 | -0648S | -209 | - |
| **FC800-20** | -7S | -7S | -30 | -20C | -11 | -357 | -24 | -26 | -0648S | -238 | - |
| **FC800-24** | -9S | -10S | - | -17C | -28 | -445 | -32 | -30 | -0648S | -288 | - |
| **FC839B-04** | -1S | -1S | -6 | - | -1 | -127 | -12 | -11 | -0622S | -68 | A5962 |
| **FC839B-06** | -12S | -2S | -10 | - | -21 | -160 | -16 | -14 | -0622S | -91 | A5975 |
| **FC839B-08** | -14S | -3S | -12 | - | -5 | -205 | -16 | -18 | -0622S | -122 | A5987 |
| **FC839B-10** | -4S | -5S | -16 | - | -6 | -239 | -20 | -20 | -0630S | -142 | - |
| **FC839B-12** | -5S | -6S | -16 | - | -9 | -280 | -22 | -22 | -0648S | -173 | - |
| **FC839B-16** | -7S | -7S | -22 | - | -10 | -381 | -28 | -30 | -0648S | -209 | - |
| **FC849-04** | -1S | -2S | -10 | -23C | -2 | -137 | -16 | -11 | -0622S | -91 | - |
| **FC849-06** | -15S | -4S | -12 | -10C | -3 | -174 | -16 | -14 | -0622S | -106 | - |
| **FC849-08** | -3S | -4S | -16 | -21C | -5 | -205 | -18 | -16 | -0622S | -142 | - |
| **FC849-10** | -4S | -5S | -16 | -12C | -23 | -254 | -20 | -20 | -0648S | -157 | - |
| **FC849-12** | -5S | -6S | -22 | -14C | -9 | -280 | -24 | -22 | -0648S | -185 | - |
| **FC849B-04** | -1S | -2S | -10 | -23C | -2 | -137 | -16 | -11 | -0622S | -91 | A5969 |
| **FC849B-06** | -15S | -4S | -12 | -10C | -3 | -174 | -16 | -14 | -0622S | -106 | A5984 |
| **FC849B-08** | -3S | -4S | -16 | -21C | -5 | -205 | -18 | -16 | -0622S | -142 | - |
| **FC849B-10** | -4S | -5S | -16 | -12C | -23 | -254 | -20 | -20 | -0648S | -157 | - |
| **FC849B-12** | -5S | -6S | -22 | -14C | -9 | -280 | -24 | -22 | -0648S | -185 | - |
| **GH100-4** | -1S | -1S | -6 | - | - | -127 | -12 | -9 | -0622S | -79 | A5962 |
| **GH100-6** | -12S | -13S | -8 | - | -21 | -160 | -16 | -11 | -0622S | -98 | A5969 |
| **GH100-8** | -14S | -3S | -10 | - | -4 | -190 | -16 | -13 | -0622S | -98 | A5984 |
| **GH100-10** | -3S | -4S | -12 | - | -5 | -222 | -20 | -16 | -0622S | -122 | - |
| **GH100-12** | -5S | -5S | -12 | - | -23 | -266 | -20 | -18 | -0630S | -157 | - |
| **GH120-4** | -1S | -13S | -8 | - | -2 | -137 | -12 | -12 | -0622S | -79 | A5962 |
| **GH120-6** | -2S | -2S | -10 | - | -3 | -171 | -16 | -16 | -0622S | -91 | A5975 |
| **GH120-8** | -14S | -3S | -12 | - | -5 | -205 | -16 | -18 | -0622S | -122 | A5987 |
| **GH120-10** | -4S | -5S | -16 | - | -6 | -239 | -20 | -20 | -0630S | -142 | - |
| **GH120-12** | -5S | -6S | -16 | - | -9 | -280 | -22 | -22 | -0648S | -173 | - |
| **GH120-16** | -7S | -7S | -22 | - | -10 | -357 | -24 | -28 | -0648S | -209 | - |
| **GH120-20** | -9S | -8S | -30 | - | - | -422 | -32 | -30 | -0648S | -288 | - |
| **GH120-24** | -10S | -15S | -30 | - | -29 | -508 | -38 | -38 | -0648S | -288 | - |
| **GH120-32** | -13S | -12S | -30 | - | -30 | -635 | -46 | -46 | -0664C | - | - |
| **GH194-4** | -1S | -1S | -6 | - | -1 | -137 | -12 | -11 | -0622S | -79 | A5962 |
| **GH194-6** | -2S | -2S | -10 | - | -3 | -174 | -16 | -14 | -0622S | -91 | A5975 |
| **GH194-8** | -15S | -3S | -10 | - | -5 | -205 | -16 | -16 | -0622S | -122 | A5987 |

*Sizes indicated are based on Hose O.D. only. If sleeve is to be placed over fittings, a larger sleeve size may be required, depending on type of fitting used.



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## Accessories to hose chart

| Hose Part # | 900564 Steel protective coil spring* | 900705 Steel protective coil sleeve* | 900952 Plastic coil sleeve* | 222005 222022 Internal support coil | 900729 Support clamp | FF90311 Heavy duty support clamp | FC425 Nylon sleeve* | 624 Fire-sleeve* | FF9217 Band style clamp | FF90754 Guardian sleeve* | A5950 Bend restrictor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **GH194-10** | -4S | -4S | -12 | - | -6 | -239 | -20 | -18 | -0630S | -142 | - |
| **GH194-12** | -4S | -4S | -12 | - | -6 | - | -20 | -18 | -0633S | -157 | - |
| **GH194-16** | -6S | -6S | -22 | - | -25 | -357 | -24 | -26 | -0648S | -209 | - |
| **GH194-20** | -9S | -8S | -30 | - | -1 | -445 | -32 | -30 | -0648S | -288 | - |
| **GH194-24** | -8S | -8S | -30 | - | -13 | -508 | -38 | -38 | -0648S | -288 | - |
| **GH194-32** | -13S | -12S | -30 | - | -30 | -635 | -46 | -46 | -0664C | - | - |
| **GH195-4** | -12S | -13S | -8 | - | -2 | -150 | -15 | -11 | -0622S | -79 | A5969 |
| **GH195-6** | -14S | -2S | -10 | - | -4 | -190 | -16 | -13 | -0622S | -98 | A5984 |
| **GH195-8** | -3S | -3S | -12 | - | -5 | -222 | -18 | -16 | -0622S | -122 | - |
| **GH195-10** | -6S | -5S | -16 | - | -6 | -266 | -20 | -18 | -0630S | -142 | - |
| **GH195-12** | -7S | -6S | -16 | - | -9 | -300 | -24 | -20 | -0648S | -173 | - |
| **GH195-16** | -9S | -9S | -22 | - | -10 | -381 | -32 | -26 | -0648S | -209 | - |
| **GH195-20** | -10S | -10S | -30 | - | -12 | -483 | -38 | -32 | -0664C | -288 | - |
| **GH195-24** | -10S | -11S | -30 | - | -13 | - | -40 | -36 | -0648S | -366 | - |
| **GH195-32** | -11S | -12S | -30 | - | -30 | -635 | -54 | -46 | -0664C | - | - |
| **GH466-20** | -10S | -8S | -30 | - | -13 | -508 | -38 | -36 | -0648S | -288 | - |
| **GH493-6** | -15S | -3S | -12 | - | -5 | -205 | -16 | -16 | -0622S | -106 | - |
| **GH493-8** | -3S | -4S | -12 | - | -6 | -239 | -20 | -20 | -0648S | -122 | - |
| **GH493-10** | -4S | -5S | -16 | - | -8 | -280 | -20 | -22 | -0648S | -157 | - |
| **GH493-12** | -5S | -6S | -16 | - | -27 | -300 | -24 | -24 | -0648S | -173 | - |
| **GH493-16** | -7S | -7S | -22 | - | -10 | -381 | -28 | -28 | -0648S | -209 | - |
| **GH493-20** | -8S | -10S | -22 | - | -28 | - | -32 | -38 | -0648S | -288 | - |
| **GH493-24** | -8S | -10S | -30 | - | -29 | - | -38 | -38 | -0648S | -366 | - |
| **GH493-32** | -13S | -11S | -30 | - | -31 | - | -46 | -46 | -0664S | - | - |
| **GH506-12** | -7S | -6S | -16 | - | -24 | -320 | -24 | -50 | -0648S | -173 | - |
| **GH506-16** | -9S | -7S | -22 | - | -10 | -381 | -32 | -26 | -0648S | -209 | - |
| **GH663-3** | -1S | -1S | -8 | - | -01 | - | -12 | -9 | -0622S | -79 | A5953 |
| **GH663-4** | -1S | -13S | -10 | -23C | -1 | -127 | -12 | -10 | -0622S | -91 | A5962 |
| **GH663-5** | -1S | -2S | -10 | -23C | -2 | -137 | -16 | -11 | -0622S | -91 | A5969 |
| **GH663-6** | -2S | -3S | -12 | -10C | -21 | -171 | -16 | -13 | -0622S | -98 | A5975 |
| **GH663-8** | -14S | -4S | -12 | -21C | -4 | -190 | -16 | -16 | -0622S | -142 | A5987 |
| **GH663-10** | -4S | -5S | -16 | -12C | -5 | -222 | -18 | -18 | -0622S | -157 | - |
| **GH663-12** | -5S | -14S | -22 | -14C | -8 | -266 | -20 | -20 | -0648S | -173 | - |
| **GH663-16** | -7S | -7S | -30 | -15C | -25 | -334 | -24 | -26 | -0648S | -219 | - |
| **GH663-20** | -9S | -8S | - | -20C | -11 | -422 | -32 | -30 | -0648S | -288 | - |
| **GH663-24** | -8S | -10S | - | -24C | -28 | -483 | -38 | -38 | -0648S | -366 | - |
| **GH663-32** | -13S | -11S | - | - | -30 | -635 | -46 | -46 | -0664C | - | - |
| **GH681-3** | -1S | -1S | -6 | - | -1 | - | -12 | -11 | -0622S | -68 | A5953 |
| **GH681-4** | -1S | -1S | -6 | - | -1 | -127 | -15 | -11 | -0622S | -68 | A5962 |
| **GH681-5** | -1S | -1S | -6 | - | -1 | -137 | -12 | -11 | -0622S | -79 | A5962 |

*Sizes indicated are based on Hose O.D. only. If sleeve is to be placed over fittings, a larger sleeve size may be required, depending on type of fitting used.



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| Hose Part # | 900564 Steel protective coil spring* | 900705 Steel protective coil sleeve* | 900952 Plastic coil sleeve* | 222005 222022 Internal support coil | 900729 Support clamp | FF90311 Heavy duty support clamp | FC425 Nylon sleeve* | 624 Fire-sleeve* | FF9217 Band style clamp | FF90754 Guardian sleeve* | A5950 Bend restrictor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **GH681-6** | -12S | -2S | -10 | - | -21 | -160 | -16 | -14 | -0622S | -91 | A5975 |
| **GH681-8** | -14S | -3S | -12 | - | -4 | -205 | -20 | -16 | -0622S | -98 | A5984 |
| **GH681-10** | -3S | -3S | -12 | - | -5 | -205 | -20 | -16 | -0622S | -122 | - |
| **GH681-12** | -4S | -5S | -16 | - | -6 | -254 | -24 | -20 | -0630S | -142 | - |
| **GH681-16** | -5S | -6S | -16 | -13C | -9 | -320 | -32 | -20 | -0630S | -173 | - |
| **GH681-20** | -7S | -7S | -22 | -14C | -11 | -400 | -38 | -30 | -0648S | -238 | - |
| **GH681-24** | -8S | -10S | -30 | - | -12 | -483 | -40 | -32 | -0664C | -288 | - |
| **GH681-32** | -13S | -12S | -30 | - | -30 | -635 | -54 | -46 | -0664C | - | - |
| **GH781-4** | -1S | -13S | -8 | - | -2 | -137 | -15 | -12 | -0622S | -79 | A5962 |
| **GH781-6** | -2S | -2S | -10 | - | -3 | -174 | -16 | -16 | -0622S | -91 | A5975 |
| **GH781-8** | -14S | -3S | -12 | - | -5 | -205 | -20 | -18 | -0622S | -142 | A5987 |
| **GH781-10** | -5S | -5S | -12 | - | -6 | -239 | -24 | -18 | -0630S | -142 | - |
| **GH781-12** | -6S | -14S | -16 | - | -9 | -280 | -24 | -20 | -0648S | -173 | - |
| **GH781-16** | -9S | -7S | -22 | - | -10 | -357 | -28 | -24 | -0648S | -209 | - |
| **GH781-20** | -9S | -9S | -22 | - | -12 | -422 | -32 | -30 | -0648S | -288 | - |
| **GH781-24** | -10S | -8S | -30 | - | -13 | -508 | -38 | -36 | -0648S | -288 | - |
| **GH781-32** | -11S | -12S | -30 | - | -30 | -635 | -54 | -46 | -0664C | -288 | - |
| **GH793-4** | -1S | -13S | -8 | - | -2 | -150 | -12 | -12 | -0622S | -79 | A5969 |
| **GH793-6** | -15S | -2S | -10 | - | -4 | -190 | -16 | -16 | -0622S | -98 | A5984 |
| **GH793-8** | -3S | -3S | -12 | - | -5 | -222 | -16 | -18 | -0622S | -122 | - |
| **GH793-10** | -4S | -5S | -16 | - | -6 | -266 | -20 | -20 | -0630S | -157 | - |
| **GH793-12** | -5S | -6S | -16 | - | -9 | -300 | -20 | -22 | -0648S | -173 | - |
| **GH793-16** | -7S | -9S | -22 | - | -10 | -381 | -24 | -28 | -0648S | -209 | - |
| **GH793-20** | -8S | -10S | -30 | - | -12 | -483 | -32 | -32 | -0664C | -288 | - |
| **GH793-24** | -10S | -10S | -30 | - | -13 | - | -38 | -38 | -0648S | -366 | - |
| **GH793-32** | -13S | -12S | -30 | - | -30 | -635 | -46 | -46 | -0664C | - | - |
| **H20104** | -1S | -1S | -6 | - | - | -127 | -12 | -9 | -0622S | -68 | A5962 |
| **H20106** | -12S | -13S | -8 | - | -21 | -160 | -16 | -11 | -0622S | -98 | A5962 |
| **H20108** | -14S | -3S | -10 | - | -4 | -190 | -16 | -13 | -0622S | -68 | A5975 |
| **H20110** | -3S | -4S | -12 | - | -5 | -222 | -20 | -16 | -0622S | -122 | A5984 |
| **H20112** | -5S | -5S | -12 | - | -23 | -266 | -20 | -18 | -0630S | -157 | - |
| **H20116** | -6S | -7S | -30 | -16C | -25 | -334 | -24 | -24 | -0648S | -157 | - |
| **WH004-12** | -5S | -6S | -22 | -14C | -8 | -280 | -24 | -22 | -0648S | -185 | - |
| **WH004-16** | -7S | -7S | -30 | -15C | -25 | -334 | -24 | -26 | -0648S | -219 | - |
| **WH004-20** | -7S | -9S | - | -20C | -11 | -400 | -32 | -30 | -0648S | -288 | - |
| **WH004-24** | -8S | -10S | - | -24C | -28 | -483 | -38 | -38 | -0648S | -366 | - |
| **WH004-32** | -13S | -11S | - | - | -14 | -572 | -46 | -42 | -0648S | - | - |
| **WH004-40** | - | - | - | -40C | -16 | - | -54 | -50 | -0664C | - | - |
| **WH004-48** | - | - | - | -48C | -17 | - | -59 | -60 | -0664C | - | - |

*Sizes indicated are based on Hose O.D. only. If sleeve is to be placed over fittings, a larger sleeve size may be required, depending on type of fitting used.



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Aeroquip by Danfoss

# Machines and tooling

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# Core crimp machines

With the Danfoss-branded core crimp machine portfolio, all customers have access to the same crimp machines and tooling. This simplified and improved offering includes lower cost options as well as both positive stop and variable machines to meet all of your application needs. Compare our new offering of crimp machines and their associated features to understand which crimper is best for you.

Quick reference crimp machine comparison chart

| Crimp Machines | ET1187 | ET1000 | FT1380/FT1380e | T-420 |
|---|---|---|---|---|
| **Production volume** | Low | Low | Medium | Medium |
| **Type** | Variable | Positive stop | Variable | Positive stop |
| **Capability-braided "up to"** | 1-1/4 | 1" | 1-1/4" | 1-1/4" |
| **Capability-spiral "up to"** | 1" | 1" | 1-1/4" | 1-1/4" |
| **Capability-industrial "up to"** | 1-1/4" | 1" | 1-1/4" | 1-1/4" |
| **Application** | Portable, job shops, maintenance departments | Portable, job shops, maintenance departments | Hose distributors, small assembly shops | Hose distributors, small assembly shops, factory, construction, mines |
| ***Pump options** | 110v, air/hydraulic, 12v, hand pump | 110v, air/hydraulic, 12v, hand pump | 115v, 230v | 110v, 220v |

*Capabilities based on Danfoss core hose and fitting products

*See pump ordering options for each machine for specific kit numbers



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# Core crimp machines

With the Danfoss-branded core crimp machine portfolio, all customers have access to the same crimp machines and tooling. This simplified and improved offering includes lower cost options as well as both positive stop and variable machines to meet all of your application needs. Compare our new offering of crimp machines and their associated features to understand which crimper is best for you.

Quick reference crimp machine comparison chart

| Crimp Machines | ET1187 | ET1000 | FT1380/FT1380e | T-420 |
|---|---|---|---|---|
| **Production volume** | Low | Low | Medium | Medium |
| **Type** | Variable | Positive stop | Variable | Positive stop |
| **Capability-braided "up to"** | 1-1/4 | 1" | 1-1/4" | 1-1/4" |
| **Capability-spiral "up to"** | 1" | 1" | 1-1/4" | 1-1/4" |
| **Capability-industrial "up to"** | 1-1/4" | 1" | 1-1/4" | 1-1/4" |
| **Application** | Portable, job shops, maintenance departments | Portable, job shops, maintenance departments | Hose distributors, small assembly shops | Hose distributors, small assembly shops, factory, construction, mines |
| ***Pump options** | 110v, air/hydraulic, 12v, hand pump | 110v, air/hydraulic, 12v, hand pump | 115v, 230v | 110v, 220v |

*Capabilities based on Danfoss core hose and fitting products

*See pump ordering options for each machine for specific kit numbers



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# Core crimp machines (cont.)

Quick reference crimp machine comparison chart

| Crimp Machines | FT1390 | ET4001 | ET5050 |
|---|---|---|---|
| **Production volume** | Medium/high | Medium | High |
| **Type** | Variable | Positive stop | Variable |
| **Capability-braided (up to)** | 2" | 2" | 2" |
| **Capability-spiral (up to)** | 2" | 2" | 2" |
| **Capability-industrial (up to)** | 2" | 2" | 6" |
| **Application** | Hose distributors, assembly shops | Hose distributors, assembly shops, construction, mines | Industrial production facility, specialty |
| ***Pump options** | 115v, 230v | 220v | 230v, 380v, 400v, 420v, 440v, 460v, 480v |

*Capabilities based on Danfoss core hose and fitting products

*See pump ordering options for each machine for specific kit numbers



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# ET1187

## Portable crimp machine

The ET1187 machine is our most economical variable crimp machine to date. It boasts a broad crimp capability with a new "ease-of-use" that is sure to excite hose assemblers in the field.

GH681 / H180

GH781 / H280

GH493 / H430

Micrometer dial

This machine is designed to easily adjust to Danfoss' core products. It's as simple as turning the collar to the correct color to match the layline on the hose, adjust the ring so that the correct size dot aligns with the correct size line on the collar and the machine is set for the correct crimp. Load the correct crimp die based on the crimp die chart attached to the machine, and the machine is ready to crimp.

### Tooling options

| Tooling | Tooling capabilities | | | Tooling packages | |
|---|---|---|---|---|---|
| Die cage part # | 1 wire braid: 1A/Winner | 2 wire braid: 1A/Winner | 4 wire spiral : 4S | ET4020TP-0002 | ET4020TP-0003 |
| **FT1380-200-M150** | -4 | -4 | | X | X |
| **FT1380-200-M180** | -6 | -4† | | X | X |
| **FT1380-200-M210** | -8 | -6 | -6 | X | X |
| **FT1380-200-M240** | -10 | -8 | -8†† | X | X |
| **FT1381-200-M280** | -12 | -10, -12† | -8, -10 | X | X |
| **FT1380-200-M320** | | -12 | -12 | X | X |
| **FT1380-200-M370** | -16 | -16 | | X | X |
| **FT1380-200-M420** | | | -16 | | X |
| **FT1382-200-M465** | -20 | -20 | | | X |

†Die cage used to crimp Winner hose with two piece Winner fitting
††Die cage used to crimp Winner hose with 4S fitting
*Consult the PowerSource Crimp Spec tool for the die cage needed to crimp -16 Winner two piece fittings

**NOTE:** Visit the Danfoss PowerSource Crimp Specs tool at danfoss.com/crimp to find the tooling needed for all of the hoses and fittings you plan to crimp

### Specifications

**Dimensions:**
22" high x 9" wide x 11" deep

**Weight:** 65 lbs

Available with bench and truck mount brackets

Bench mount

Truck mount

### Capabilities

- **Braided hose:** -4 thru -20
- **Spiral hose:** -6 thru -16

### Features

- Can be mounted on service vehicles or bench tops
- Can be used remotely, 65lbs
- Can be powered with virtually any 10,000 psi hydraulic power source (minimum of 36 cu. inch pump reservoir capacity is required)
- Utilizes existing FT1380 dies

### Benefits

- Color-coded collar for core hose products makes setup fast and easy
- Easily transported between job sites
- Versatile power source options
- Lower investment cost than other variable crimpers
- Comes with high efficiency PTFE grease



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# ET1187

## Portable crimp machine

### Crimp machine part numbers

**ET1187-001**
Bench mount machine, no pump, no tooling (includes bracket) — for premium hose GH681/H180, GH781/H280, GH493/H430)

**ET1187-002**
Truck mount machine, no pump, no tooling (includes bracket) — for premium hose GH681/H180, GH781/H280, GH493/H430)

**ET1187-003**
Bench mount machine, no pump, no tooling (includes bracket) — for Winner hose EC115, EC215, EC118

**ET1187-004**
Truck mount machine, no pump, no tooling (includes bracket) — for Winner hose EC115, EC215, EC415

### Crimp machine and tooling package part numbers

**ET1187-008**
Contains ET1187 Bench mount machine (includes bracket) for premium hose, 110v pump kit, and ET4020TP-0002 tooling package

**ET1187-010**
Contains ET1187-001 bench mount crimper, ET9000-45-110 portable saw, 110v pump, ET4020TP-0002 tooling package, and the ET1187-0029 crimper portability kit

### *Pump part numbers

**ET1000PK-001**
2-Stage hand pump

**ET1000PK-002**
Air/hydraulic pump

**ET1000PK-003**
110v electric pump

**ET1000PK-004**
12v DC electric pump

*These pump kits include the pump, connecting hose assembly, and all of the adapters necessary to connect the pump to the ET1187 crimp machine

### Accessory part numbers

**T-400-G**
1.5 oz. tube, high efficiency PTFE grease

**FF91455**
16 oz. can, high efficiency PTFE grease

**ET1187C-0008PR**
Replacement barrel for the ET1187-001 or ET1187-002 machine (for premium hose GH681/H180, GH781/H280, GH493/H430)

**ET1187C-0008WR**
Replacement barrel for the ET1187-003 or ET1187-004 machine (for Winner hose EC115, EC215, EC415)

### Accessory part numbers (cont.)

**ET1187C-0009PR**
Replacement knob for the ET1187-001 or ET1187-002 machine (for premium hose GH681/H180, GH781/H280, GH493/H430)

**ET1187C-0009WR**
Replacement knob for the ET1187-003 or ET1187-004 machine (for Winner hose EC115, EC215, EC118)

**ET1187C-0017**
Bench mount bracket (separate)

**ET1187C-0019**
Truck mount bracket (separate)

**ET1187C-0028 Handle kit**
Includes 2 easy grip handles and mounting hardware

**ET1187C-0029 Portability kit**
Includes handle kit, longer hose assembly, and FF series QD couplings

**FT1380DR-12 Lazy Susan die rack**
Holds twelve FT1380 dies

### ET1187 Ordering options

**Place your order for the desired machine, pump, and tooling separately**, following the chart below
OR order a machine package with tooling and include the part number ET1187-008 and part number ET1187-010.

**Tooling can also be ordered a la carte.**
Visit the Danfoss PowerSource Crimp Specs tool at danfoss.com/crimp to find the tooling needed for all of the hoses and fittings you plan to crimp.

| ET1187 ordering | | |
|---|---|---|
| Select your base machine | Select your pump kit | Select your tooling package |
| **ET1187-001** Base machine with bench mount only | **ET1000PK-003** 110v pump kit | **ET4020TP-0002** |
| **ET1187-002** Base machine with truck mount only | **ET1000PK-002** A/H pump kit | **ET4020TP-0003** |
| **ET1187-003** Base machine with bench mount only (for Winner hose EC115, EC215, EC415) | **ET1000PK-004** 12v pump kit | |
| **ET1187-004** Base machine with truck mount only (for Winner hose EC115, EC215, EC415) | **ET1000PK-001** Hand pump kit | |

or

| Package with tooling |
|---|
| Order a machine package with tooling |
| **ET1187-008** |
| **ET1187-010** |

**Note:** All available pump kits shown include hose assembly and are CSA compliant



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# ET1000

## Portable crimp machine

The portable ET1000 crimp machine boasts a broad crimp capability with an ease-of-use that is sure to please hose assemblers. With four pump options—air/hydraulic, hand, 110v, or 12v DC—this portable machine can travel to the worksite. The machine comes equipped with a stand pre-drilled for mounting to a workbench or table-top.

### ET1000 tooling options

| Tooling | Tooling capabilities | | | Tooling packages | |
|---|---|---|---|---|---|
| Die cage part # | 1 wire braid 1A/Winner | 2 wire braid 1A/Winner | 4 wire spiral 4S | *ET1000TP-1002 New placement package | *ET1000TP-1001 Conversion package |
| **ET313DC-4Z** | -4 | -4 | | X | X |
| **ET313DC-5Z** | -5 | -5 | | | |
| **ET313DC-6Z** | -6 | -6 | | X | X |
| **ET313DC-8Z** | -8 | -8 | | X | X |
| **ET313DC-10Z** | -10 | -10 | | | |
| **ET1000DC-12Z** | -12 | -12 | | X | X |
| **ET1000DC-16Z** | -16 | -16 | | X | X |
| **ET313DC-4S6** | | | -6 | | |
| **ET313DC-4S8** | | | -8 | X | X |
| **ET313DC-4S10** | | | -10 | | |
| **ET1000DC-4S12** | | | -12 | X | X |
| **ET1000DC-4S16** | | | -16 | X | X |

*ET1000TP-1002 includes the following spacer rings—ET425SR-150A, ET313SR-090A, ET313SR-030D
*ET1000TP-1002 includes pusher extension—ET1000C-0012
*ET1000TP-1002 includes adapter ring—ET1000AR-001
*ET1000TP-1001 includes the following spacer rings—ET425SR-150A, ET313SR-090A

**NOTE:** Visit the Danfoss PowerSource Crimp Specs tool at danfoss.com/crimp to find the tooling needed for all of the hoses and fittings you plan to crimp

### Specifications

**Dimensions:**
22" high x 16" wide x 14" deep

**Weight:** 65 lbs

Available with bench and truck mount brackets

Bench mount

Truck mount

### Capabilities

- **Braided hose:** -4 thru -16
- **Spiral hose:** -6 thru -16

### Features

- Portable, positive stop, economical
- Can be mounted on service vehicles
- Utilizes 2-piece collet assemblies
- Spacer rings control the crimp diameter

### Benefits

- Sliding pusher allows for easier fitting insertion into the machine
- Simple positive-stop crimp diameter control system for consistent crimping time after time with no operator adjustments required
- Easily transported between job sites
- Versatile power source options
- Electricity is required only when using an electric pump
- Comes with high efficiency PTFE grease



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# ET1000

## Portable crimp machine

### Crimp machine part numbers

**ET1000-001**
Base machine

### Crimp machine and tooling package part numbers

**ET1000-020**
Contains ET1000 crimper, / 110v pump kit, and ET1000TP-1002 tooling package

**ET1000-021**
Contains ET1000 crimper, air/hydraulic pump kit, and ET1000TP-1002 tooling package

### Crimp machine and saw package part numbers

**ET1000-022**
Contains ET1000-001 bench mount crimper, ET9000-45-110 portable saw, 110v pump, ET4020TP-0002 tooling package, and the ET1187-0029 crimper portability kit

### *Pump part numbers

**ET1000PK-001**
Hand pump

**ET1000PK-002**
Air/hydraulic pump

**ET1000PK-003**
110 volt electric pump

**ET1000PK-004**
12 volt DC electric pump

*Pump kits contain hose assembly and fittings to attach pump to machine

### Accessory part numbers

**T-400-G**
1.5 oz. tube high efficiency PTFE grease

**FF91455**
16 oz. can, high efficiency PTFE grease

**ET1187C-0028** Handle kit
Includes 2 easy grip handles and mounting hardware

**ET1187C-0029** Portability kit
Includes handle kit, longer hose assembly, and FF series QD couplings

**ET1000C-0021**
Wall bracket

**ET1000C-0001**
Bench mount bracket (included with base machine)

### ET1000 Ordering options

For your convenience, we have created one to two optimized machine and tooling package options for each of the core crimp machines. **If the available options do not meet your needs, place your order for the desired machine, pump, and tooling separately**, following the chart below.

**Tooling can also be ordered a la carte.** Visit the Danfoss PowerSource Crimp Specs tool at danfoss.com/crimp to find the tooling needed for all of the hoses and fittings you plan to crimp.

| ET1000 ordering | | | | Package with tooling |
|---|---|---|---|---|
| Select your base machine | Select your pump kit | Select your tooling package | | Order a machine package with tooling |
| **ET1000-001** Base ET1000 Machine | **ET1000PK-003** 110v pump kit | **ET1000TP-1002** New placement tooling package | | **ET1000-020** |
| | **ET1000PK-002** A/H pump kit | **ET1000TP-1001** Conversion tooling package | or | **ET1000-021** |
| | **ET1000PK-004** 12v pump kit | | | **ET1000-022** |
| | **ET1000PK-001** Hand pump kit | | | |

**NOTE:** All available pump kits shown include hose assembly and are CSA compliant



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# FT1380/FT1380e

## General purpose crimp machine

The FT1380 crimp machine from Danfoss crimps all your hose needs up to and including -20 spiral wire hose. The FT1380 is electronically controlled to give fast, accurate crimps the first time and every time you need a hose assembly. The electronic keypad is easy to adjust, with up to 10 programmable crimp settings. For hose styles and sizes used less frequently, simply enter the 3 digit code of that hose.

For FT1380e specifications and ordering details, please refer to:
FT1380e Electronic Crimper by Danfoss: Spec Sheet AV418159937321en-000201

### Tooling options

| Tooling | Tooling Capabilities | | | | Tooling Packages | |
|---|---|---|---|---|---|---|
| Die cage part # | 1 wire braid 1A/Winner | 2 wire braid 1A/Winner | 4 wire spiral 4S | 6 wire spiral 6S | ET4020TP-0002 | ET4020TP-0003 |
| **FT1380-200-M150** | -4 | -4 | | | X | X |
| **FT1380-200-M180** | -6 | -4† | | | X | X |
| **FT1380-200-M210** | -8 | -6 | -6 | | X | X |
| **FT1380-200-M240** | -10 | -8 | -8†† | | X | X |
| **FT1381-200-M280** | -12 | -10,-12† | -8,-10 | | X | X |
| **FT1380-200-M320** | | -12 | -12 | | X | X |
| **FT1380-200-M370** | -16 | -16 | | | X | X |
| **FT1380-200-M420** | | | -16 | | | X |
| **FT1382-200-M465** | -20 | -20 | -20 | -16 | | X |
| **FT1382-275-M520** | | | | -20 | | |

†Die cage used to crimp designated hose diameter with two piece Winner fitting

††Die cage used to crimp Winner hose with 4S fitting

*Consult the PowerSource Crimp Spec tool for the die cage needed to crimp -16 Winner two piece fittings

**NOTE:** Visit the Danfoss PowerSource Crimp Specs tool at danfoss.com/crimp to find the tooling needed for all of the hoses and fittings you plan to crimp

### Crimp machine part numbers

**FT1380-115/FT1380e-115**
Base machine with 115v pump

**FT1380-115CSA/FT1380e-115CSA**
Base machine with 115v pump, CSA approved

**FT1380-230/FT1380e-230**
Base machine with 230v pump

**FT1380-230CSA/FT1380e-230CSA**
Base machine with 230v pump, CSA approved

### Pump part numbers

All pumps are included with machine purchase. To review machine and pump package options please refer to the ordering options on the following page.

### Crimp machine and tooling package part numbers

**FT1380-115-8**
Contains FT1380 crimper, 115v pump, and ET4020TP-0003 tooling package

**FT1380-115-8CSA**
Contains FT1380 crimper, 115v pump, and ET4020TP-0003 tooling package, CSA approved

**FT1380e-115-9**
Contains FT1380e crimper, 115v pump, and ET4020TP-0003 tooling package

**FT1380e-115-9CSA**
Contains FT1380e crimper, 115v pump, and ET4020TP-0003 tooling package, CSA approved

### Specifications

**Dimensions:**
28.5" high x 12.75" wide x 25.75" deep

**Weight:** 238 lbs.

### Capabilities

- **Braided hose:** -4 thru -20
- **Spiral hose:** -6 thru -20

### Features

**FT1380e**

- FT1380e model features pre-loaded crimp specs, unlimited favorites, color assembly photos, and administrator capabilities

**FT1380/FT1380e**

- User-friendly operation to minimize training and mistakes
- Pre-set crimp settings and simple die cage insertion reduce setup time
- Electronic controls for minimal maintenance
- Upright design for easy hose insertion
- Compact design that requires little space

### Benefits

**FT1380e**

- FT1380e model increases operator safety, speeds up assembly process, and reduces operator error and waste

**FT1380/FT1380e**

- Easy and quick to electronically enter crimp settings
- Can pre-program 10 most popular crimp settings
- Die cages easily slip in and out of machine
- Comes with high efficiency PTFE grease
- FT1380e comes with USB drive, stylus, and microfiber cloth



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# FT1380/FT1380e

## General purpose crimp machine

### Accessory part numbers

**FT1380-2-4**
Optional die holder kit—kit includes 4 die holder plates each of which will hold 2 die cages. Holes are pre-drilled on base of FT1380 machine to accept these 4 plates. Not intended for use with the FT1380e electronic crimp machine.

**FT1380-4**
Optional fitting backstop—kit includes backstop and 5/32" hex wrench. The backstop allows the FT1380 to crimp PTFE hose and to be utilized for a fitting locator to increase efficiency.

**FT1330-XL**
1A fitting locators

**FT1380-XL**
4S fitting locators

**T-400-G**
1.5 oz. tube high efficiency PTFE grease

**FF91455**
16 oz. can, high efficiency PTFE grease

**FT1380-2-9**
Die cage repair kits for FT1380-200-size, FT1380-275-size

**FF91042** Crimper cart

**FT1380DR-12** Lazy Susan die rack

Holds twelve FT1380 dies

### Upgrade Kits:

Standard FT1380 crimpers can be upgraded to the FT1380e electronic platform.

### Upgrade Kit Part Numbers:

**FT1380e-115-UP**
**FT1380e-115-UPCSA**
**FT1380e-230-UP**
**FT1380e-230-UPCSA**

### FT1380/FT1380e Ordering options

For your convenience, we have created one to two optimized machine and tooling package options for each of the core crimp machines. **If the available options do not meet your needs, place your order for the desired machine, pump, and tooling separately,** following the chart below.

**Tooling can also be ordered a la carte.** Visit the Danfoss PowerSource Crimp Specs tool at danfoss.com/crimp to find the tooling needed for all of the hoses and fittings you plan to crimp.

| FT1380/FT1380e ordering | | | | Package with tooling |
|---|---|---|---|---|
| Select your base machine | Pump included | Select your tooling package | | Order a machine package with tooling: |
| **FT1380-115/FT1380e-115** Base machine with 115v pump | 115v pump included | **ET4020TP-0003** | | **FT1380-115-8** |
| **FT1380-115CSA/FT1380e-115CSA** Base machine with 115v pump, CSA approved | 115v pump included | **ET4020TP-0002** | or | **FT1380-115-8CSA** |
| **FT1380-230/FT1380e-230** Base machine with 230v pump | 230v pump included | | | **FT1380e-115-9** |
| **FT1380-230CSA/FT1380e-230CSA** Base machine with 230v pump, CSA approved | 230v pump included | | | **FT1380e-115-9CSA** |

Note: Consider an alternative positive stop machine when crimping large quantities of -20 90 degree fittings.

| Specialty crimp die cages | | |
|---|---|---|
| Tooling | Tooling capabilities | |
| **Die cage part #** | **Hose size** | **Hose style** |
| **FT1380-275-M070** | -03 | PTFE |
| **FT1380-275-M090** | -03 Synflex, -04, -05 PTFE | Synflex, PTFE |
| **FT1380-275-M120** | -04 Synflex, -06 PTFE | Synflex, PTFE |
| **FT1382-275-M370** | -16 | Two-piece Winner |
| **FT1382-275-M520** | -20 | 6S |
| ***FT1380-275-R5-04** | -04 | Truck and fuel 100R5 |
| ***FT1380-275-R5-05** | -05 | Truck and fuel 100R5 |
| ***FT1380-275-R5-06** | -06 | Truck and fuel 100R5 |
| ***FT1380-275-R5-08** | -08 | Truck and fuel 100R5 |
| ***FT1380-275-R5-10** | -10 | Truck and fuel 100R5 |
| ***FT1380-275-R5-12** | -12 | Truck and fuel 100R5 |
| ***FT1380-275-R5-16** | -16 | Truck and fuel 100R5 |
| ***FT1380-275-R5-20** | -20 | Truck and fuel 100R5 |

*Tooling above for use with Aeroquip hose and fittings



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# T-420

## General purpose crimp machine

The T-420 is a versatile machine ideal for your shop, factory, construction, and mine locations. Large capacity combined with lever-activated crimping gives you wide coverage and a quick and simple way to make factory-quality hose assemblies.

### Tooling options

| Tooling | Tooling capabilities | | | Tooling packages | |
|---|---|---|---|---|---|
| Die cage part # | 1 wire braid 1A/Winner | 2 wire braid 1A/Winner | 4 wire spiral 4S | T420TP-1001 | *T420TP-1002 (for Winner hose with Z fittings) |
| **ET425DC-4Z** | -4 | -4 | | X | X |
| **ET425DC-5Z** | -5 | -5 | | | |
| **ET425DC-6Z** | -6 | -6 | | X | X |
| **ET425DC-8Z** | -8 | -8 | | X | X |
| **ET425DC-10Z** | -10 | -10 | | | |
| **ET425DC-12Z** | -12 | -12 | | X | X |
| **ET425DC-16Z** | -16 | -16 | | X | X |
| **ET425DC-20Z** | -20 | -20 | | | X |
| **ET425DC-4S6** | | | -6 | | X |
| **ET425DC-4S8** | | | -8 | X | X |
| **ET425DC-4S10** | | | -10 | | |
| **ET425DC-4S12** | | | -12 | X | X |
| **ET425DC-4S16** | | | -16 | X | X |
| **ET425DC-4S20** | | | -20 | X | X |

*T420TP-1001 includes spacer ring ET425SR-105A

*T420TP-1001 includes adapter ring ET425AR-14

*T420TP-1002 includes adapter ring ET425AR-14

*T420TP-1002 includes the following spacer rings—ET425SR-075A, ET425SR-030D, ET425SR-015A, ET425SR-060D, ET425SR-030A, ET425SR-045A, ET425SR-015D, ET425SR-060A, ET425SR-165A, ET425SR-105A, ET425SR-090A

**NOTE:** Visit the Danfoss PowerSource Crimp Specs tool at danfoss.com/crimp to find the tooling needed for all of the hoses and fittings you plan to crimp

### Specifications

**Dimensions:**
22" high x 10" wide x 20-1/2" dee

**Weight:** 210 lbs

### Capabilities

- **Braided hose:** -4 thru -20
- **Spiral hose:** -6 thru -20

### Features

- Positive stop, economical
- Utilizes 2-piece collet assemblies
- Spacer rings control the crimp diameter
- Can be mounted on a bench, the C-40X cabinet, or the FF91042 crimper cart

### Benefits

- Simple positive-stop crimp diameter control system for consistent crimping time after time with no operator adjustments required
- Versatile power source options
- Comes with high efficiency PTFE grease



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# T-420

## General purpose crimp machine

### Crimp machine part numbers

**T-420-1**
Base T-420 machine

**T-420-1CSA**
Base T-420 machine, CSA approved

### Crimp machine and tooling package part numbers

**T-420-001**
Contains T-420 crimper, 220v pump kit, T420TP-1001 tooling package

**T-420-002**
Contains T-420 crimper, 110v pump kit, T420TP-1001 tooling package

**T-420-001CSA**
Contains T-420 crimper, 220v pump kit, T420TP-1001 tooling package, CSA approved

**T-420-002CSA**
Contains T-420 crimper, 110v pump kit, T420TP-1001 tooling package, CSA approved

### Pump part numbers

**ET420-007**
110 volt electric pump

**ET420-007CSA**
110 volt electric pump, CSA approved

**ET420-008**
220 volt electric pump

**ET420-008CSA**
220 volt electric pump, CSA approved

### Accessory part numbers

**T-400-G**
1.5 oz. tube high efficiency PTFE grease

**FF91455**
16 oz. can, high efficiency PTFE grease

**FF91042**
Crimper cart

### Ordering options

For your convenience, we have created one to two optimized machine and tooling package options for each of the core crimp machines. **If the available options do not meet your needs, place your order for the desired machine, pump, and tooling separately**, following the chart below.

**Tooling can also be ordered a la carte.** Visit the Danfoss PowerSource Crimp Specs tool at danfoss.com/crimp to find the tooling needed for all of the hoses and fittings you plan to crimp.

| T-420 ordering | | | | Package with tooling |
|---|---|---|---|---|
| Select your base machine | Select your pump kit | Select your tooling package | | Order a machine package with tooling |
| **T-420-1** Base T-420 machine | **ET420-007** 110v pump | **T420TP-1001** | | **T-420-001** |
| **T-420-1CSA** Base T-420 machine, CSA approved | **ET420-007CSA** 110v pump, CSA approved | **T420TP-1002** (for Winner hose with 1A fittings) | or | **T-420-002** |
| | **ET420-008** 220v pump | | | **T-420-001CSA** |
| | **ET420-008CSA** 220v pump, CSA approved | | | **T-420-002CSA** |



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# FT1390

## General purpose crimp machine

The FT1390 crimp machine is a stand-alone machine and will crimp up to 2" braided, 2" four spiral, and 2" six spiral hydraulic hose assemblies. It boasts a programmable electronic keypad with 10 presets.

This keypad simplifies the hose crimping operation by allowing the machine operator to enter a predetermined setting for a specific hose type and size. The ten most often used crimp settings can be stored for one-touch retrieval. The machine will automatically crimp to the exact crimp diameter required for that hose type and size. The electronic crimp machine settings eliminate the need for spacers or shims in the crimping operation.

### Tooling options

| Tooling | Tooling capabilities | | | | Tooling packages | |
|---|---|---|---|---|---|---|
| Die cage part # | 1 wire braid 1A/Winner | 2 wire braid 1A/Winner | 4 wire spiral 4S | 6 wire spiral 6S | ET4040TP-0007 | ET4040TP-0008 |
| **FT1307-200-M150** | -4 | -4 | | | X | |
| **FT1307-200-M180** | -6 | | | | X | |
| **FT1307-200-M210** | -8 | -6 | -6 | | X | |
| **FT1307-200-M240** | -10 | -8 | | | X | |
| **FT1307-200-M280** | -12 | -10, -12† | -8, -10 | | X | |
| **FT1307-200-M320** | | -12 | | | X | |
| **FT1307-200-M370** | -16 | -16 | | | X | |
| **FT1307-200-M420** | -20 | | -16 | | X | |
| **FT1307-200-M465** | -20 | -20 | | | X | |
| **FT1307-200-M520** | -24 | | | | X | |
| **FT1307-200-M550** | -32†† | -24 | | | X | |
| **FT1307-200-M690** | -32 | -32 | | | X | |
| **FT1209-200-82** | | | -12 | | X | |
| **FT1209-200-15** | | -24† | | | | |
| **FT1209-200-46** | | -20† | | | | |
| ***FT1390-200-14** | | | -20 | | | X |
| ***FT1390-200-20** | | | -24 | | | X |
| ***FT1390-200-23** | | | -32 | | | X |
| ***FT1390-200-15** | | | | -20 | | |
| ***FT1390-200-16** | | | | -24 | | |
| ***FT1390-200-21** | | -40 | | -32 | | |

*Die cages are hinged for ease of use when crimping large elbows
†Die cage used to crimp designated hose diameter with two piece Winner fitting
††Die cage used to crimp Winner hose with 1A fitting

**NOTE:** Visit the Danfoss PowerSource Crimp Specs tool at danfoss.com/crimp to find the tooling needed for all of the hoses and fittings you plan to crimp

### Specifications

**Dimensions:**
49" high, 29" wide, 28" deep

**Weight:** 825 lbs

### Capabilities

- **Braided hose:** -4 thu -32
- **Spiral hose:** -6 thru -32

### Features

- Front-end loading design
- Electronic keypad control of crimp diameter
- Power return stroke, return limit control
- Drop-in tooling (crimp die cages)
- Backstop fitting locator
- Worklamp equipped
- Includes footswitch

### Benefits

- Easy and quick to electronically enter crimp setting
- Can pre-program 10 most popular crimp settings
- Die cages easily slip in and out of machine
- Comes with high efficiency PTFE grease



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# FT1390

## General purpose crimp machine

### Crimp machine part numbers

**FT1390-115**
Base machine with 115v pump

**FT1390-115CSA**
Base machine with 115v pump, CSA approved

**FT1390-230**
Base machine with 230v pump

**FT1390-230CSA**
Base machine with 230v pump, CSA approved

### Crimp machine and tooling package part numbers

**FT1390-115-12**
Contains FT1390 crimper with 115v pump, and ET4040TP-0007 tooling package

**FT1390-115-12CSA**
Contains FT1390 crimper with 115v pump, and ET4040TP-0007 tooling package, CSA approved

### Pump part numbers

All pumps are included with machine purchase.
To review machine and pump package options please refer to the ordering options below.

### Accessory part numbers

**T-400-G**
1.5 oz. tube high efficiency PTFE grease

**FF91455**
16 oz. can, high efficiency PTFE grease

### Ordering options

For your convenience, we have created one to two optimized machine and tooling package options for each of the core crimp machines. **If the available options do not meet your needs, place your order for the desired machine, pump, and tooling separately**, following the chart below. **Tooling can also be ordered a la carte.** Visit the Danfoss PowerSource Crimp Specs tool at danfoss.com/crimp to find the tooling needed for all of the hoses and fittings you plan to crimp.

| FT1390 ordering | | | | Package with tooling |
|---|---|---|---|---|
| Select your base machine | Pump included | Select your tooling package | | Order a machine package with tooling |
| **FT1390-115** Base machine with 115v pump | **FT1390-115** 115v pump included | **ET4040TP-0007** | | **FT1390-115-12** |
| **FT1390-115CSA** Base machine with 115v pump, CSA approved | **FT1390-115CSA** 115v pump included | **ET4040TP-0008** | or | **FT1390-115-12CSA** |
| **FT1390-230** Base machine with 230v pump | **FT1390-230** 230v pump included | | | |
| **FT1390-230CSA** Base machine with 230v pump, CSA approved | **FT1390-230CSA** 230v pump included | | | |



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# ET4001

## General purpose crimp machine

### Crimp machine part numbers

**ET4001-004**
Base ET4001 machine with hose kit, pump, work lamp

**ET4001-004CSA**
Base ET4001 machine with hose kit, pump, work lamp, CSA approved

### Pump part numbers

**ET4001P-002**
220v single phase electric pump

**T-410-22**
36" pump to press hose assembly

**ET4001P-002CSA**
220v single phase electric pump, CSA approved

### Crimp machine and tooling package part numbers

**ET4001-015**
Contains ET4001 crimper, 220v pump kit, and ET4001TP-1002 tooling package

**ET4001-015CSA**
Contains ET4001 crimper, 220v pump kit, and ET4001TP-1002 tooling package, CSA approved

### Accessory part numbers

**T-400-G**
1.5 oz. tube high efficiency PTFE grease

**FF91455**
16 oz. can, high efficiency PTFE grease

**ET4001C-0017**
Magnetic work lamp

**FF91042**
Crimper cart

### Ordering options

For your convenience, we have created one to two optimized machine and tooling package options for each of the core crimp machines. **If the available options do not meet your needs, place your order for the desired machine, pump, and tooling separately**, following the chart below.

**Tooling can also be ordered a la carte.** Visit the Danfoss PowerSource Crimp Specs tool at danfoss.com/crimp to find the tooling needed for all of the hoses and fittings you plan to crimp.

| ET4001 ordering | | | or | Package with tooling |
|---|---|---|---|---|
| Select your base machine | Pump included | Select your tooling package | | Order a machine package with tooling |
| **ET4001-004**<br>Base ET4001 machine with hose kit, pump, work lamp | **ET4001-004**<br>220v pump included | **ET4001TP-1002**<br>New placement tooling package | | **ET4001-015** |
| **ET4001-004CSA**<br>Base ET4001 machine with hose kit, pump, work lamp, CSA approved | **ET4001-004CSA**<br>220v pump included | **ET4001TP-1003**<br>(for Winner hose with 1A fittings) | | **ET4001-015CSA** |
| | | **ET4001TP-1001**<br>Conversion tooling package | | |



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# ET5050

## Industrial production crimp machine

The ET5050 is designed for high industrial production and comes pre-programmed with all of Danfoss' hose and hose fitting crimp specifications, crimp profile details, and machine settings in order to crimp to Danfoss' specifications. It crimps up to 2" spiral, 2" braided and 4" industrial in Danfoss core hose products as well as a wide variety of specialty hose.

### Tooling packages: standard die

| Standard die set part # | Die size | | Die length | | Minimum | | Crimp range maximum | |
|---|---|---|---|---|---|---|---|---|
| | mm | in | mm | in | mm | in | mm | in |
| **ET5040DC-M070S** | 7,0 | 0.276 | 82,0 | 3.23 | 7,0 | 0.28 | 9,0 | 0.35 |
| **ET5040DC-M090S** | 9,0 | 0.354 | 82,0 | 3.23 | 9,0 | 0.35 | 12,0 | 0.47 |
| **ET5040DC-M120S** | 12,0 | 0.472 | 82,0 | 3.23 | 12,0 | 0.47 | 15,0 | 0.59 |
| ***ET5040DC-M150S** | 15,0 | 0.590 | 82,0 | 3.23 | 15,0 | 0.59 | 18,0 | 0.71 |
| ***ET5040DC-M180S** | 18,0 | 0.709 | 82,0 | 3.23 | 18,0 | 0.71 | 21,0 | 0.83 |
| ***ET5040DC-M210S** | 21,0 | 0.827 | 82,0 | 3.23 | 21,0 | 0.83 | 24,0 | 0.95 |
| ***ET5040DC-M240S** | 24,0 | 0.945 | 82,0 | 3.23 | 24,0 | 0.95 | 28,0 | 1.10 |
| ***ET5040DC-M280S** | 28,0 | 1.102 | 82,0 | 3.23 | 28,0 | 1.10 | 32,0 | 1.26 |
| **ET5040DC-M320S†** | 32,0 | 1.259 | 82,0 | 3.23 | 32,0 | 1.26 | 37,0 | 1.46 |
| **ET5040DC-M355S** | 35,5 | 1.398 | 82,0 | 3.23 | 35,5 | 1.40 | 39,5 | 1.56 |
| ***ET5040DC-M370S** | 37,0 | 1.457 | 82,0 | 3.23 | 37,0 | 1.46 | 42,0 | 1.66 |
| ***ET5040DC-M420S** | 42,0 | 1.654 | 82,0 | 3.23 | 42,0 | 1.66 | 46,5 | 1.83 |
| **ET5040DC-M450S** | 45,0 | 1.772 | 82,0 | 3.23 | 45,0 | 1.77 | 50,0 | 1.97 |
| ***ET5040DC-M465S** | 46,5 | 1.831 | 82,0 | 3.23 | 46,5 | 1.83 | 52,0 | 2.05 |
| **ET5040DC-M505S** | 50,5 | 1.988 | 82,0 | 3.23 | 50,5 | 1.99 | 54,0 | 2.13 |
| ***ET5040DC-M520S** | 52,0 | 2.047 | 82,0 | 3.23 | 52,0 | 2.05 | 55,0 | 2.17 |
| ***ET5040DC-M550S** | 55,0 | 2.165 | 82,0 | 3.23 | 55,0 | 2.17 | 60,0 | 2.36 |
| **ET5040DC-M570S** | 57,0 | 2.244 | 82,0 | 3.23 | 57,0 | 2.24 | 64,0 | 2.52 |
| **ET5040DC-M590S** | 59,0 | 2.323 | 82,0 | 3.23 | 59,0 | 2.32 | 66,0 | 2.60 |
| **ET5040DC-M620S** | 62,0 | 2.441 | 82,0 | 3.23 | 62,0 | 2.44 | 70,0 | 2.76 |
| ***ET5040DC-M690S** | 69,0 | 2.717 | 82,0 | 3.23 | 69,0 | 2.72 | 73,0 | 2.87 |
| **ET5040DC-M720S** | 72,0 | 2.835 | 82,0 | 3.23 | 72,0 | 2.84 | 78,0 | 3.07 |
| **ET5040DC-M775S** | 77,5 | 3.051 | 82,0 | 3.23 | 77,5 | 3.05 | 85,5 | 3.37 |
| **ET5040DC-M790S** | 79,0 | 3.110 | 82,0 | 3.23 | 79,0 | 3.11 | 88,0 | 3.46 |

*Included in the ET5040C-0023 standard die kit
†Supplied with all ET5040 crimp machines and required for calibration
ET5040C-0001 adapter die required for all M series dies and comes standard in each KT machine package.

### Specifications

**Dimensions:**
67" high x 24" wide x 48" deep

**Weight:** 1,851 lbs
(without mounting rack and dies)

### Capabilities

- **Spiral hose:** up to 2" (DN51)
- **Braided hose:** up to 3" (DN80)
- **Industrial hose:** up to 6" (DN102)

### Features

- 280 tons of crimp force
- Designed for high production
- Pre-programmed with Danfoss crimp specs and machine settings
- Crimps up to 2" spiral, 2" braided, 6" industrial in core products
- Crimps textile braid, wire braid, spiral hydraulic, thermoplastic, PTFE, air conditioning, and other industrial and specialty hose constructions

### Benefits

- Ease of use and fast cycle times increase productivity
- Pre-loaded Danfoss crimp specs reduce errors and scrap
- Fast and safe crimp operation
- Grease free dies allow for much easier and cleaner die changeout and reduce chance for operator error due to not having to apply grease to dies and crimp ring
- Convenient die storage rack allows easy access to crimp dies and tooling



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# ET5050

## Industrial production crimp machine

| Tooling: large bore die | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Standard die set part # | Die size | | Die length | | Minimum | | Crimp range maximum | |
| | mm | in | mm | in | mm | in | mm | in |
| **ET5040PBL-M740** | 74,0 | 2.913 | 118,0 | 4.65 | 74,0 | 2.92 | 83,0 | 3.26 |
| **ET5040PBL-M780** | 78,0 | 3.070 | 118,0 | 4.65 | 78,0 | 3.07 | 86,0 | 3.38 |
| **ET5040PBL-M840** | 84,0 | 3.307 | 118,0 | 4.65 | 84,0 | 3.31 | 92,0 | 3.62 |
| **ET5040PBL-M860** | 86,0 | 3.386 | 118,0 | 4.65 | 86,0 | 3.39 | 94,0 | 3.70 |
| **ET5040PBL-M900** | 90,0 | 3.543 | 118,0 | 4.65 | 90,0 | 3.55 | 99,0 | 3.89 |
| **ET5040PBL-M960** | 96,0 | 3.800 | 118,0 | 4.65 | 96,0 | 3.80 | 105,0 | 4.13 |
| **ET5040PBL-M1030** | 103,0 | 4.055 | 118,0 | 4.65 | 103,0 | 4.06 | 113,0 | 4.44 |
| **ET5040PBL-M1060** | 106,0 | 4.173 | 126,0 | 4.96 | 106,0 | 4.18 | 116,0 | 4.56 |
| **ET5040PBL-M1110** | 110,0 | 4.331 | 126,0 | 4.96 | 110,0 | 4.33 | 121,0 | 4.76 |
| **ET5040PBL-M1160** | 116,0 | 4.567 | 126,0 | 4.96 | 116,0 | 4.57 | 127,0 | 4.99 |
| **ET5040PBL-M1210** | 121,0 | 4.764 | 126,0 | 4.96 | 121,0 | 4.77 | 133,0 | 5.23 |
| **ET5040PBL-M1260** | 126,0 | 4.961 | 126,0 | 4.96 | 126,0 | 4.96 | 138,0 | 5.43 |
| **ET5040PBL-M1310** | 131,0 | 5.157 | 126,0 | 4.96 | 131,0 | 5.16 | 144,0 | 5.66 |

**NOTE:** Each set includes 8 individual dies

| 100R5 dies for the ET5050 | | |
|---|---|---|
| Die part # | Hose size | Hose style |
| **ET5040DC-R5-04** | -04 | Truck and fuel 100R5 |
| **ET5040DC-R5-05** | -05 | Truck and fuel 100R5 |
| **ET5040DC-R5-06** | -06 | Truck and fuel 100R5 |
| **ET5040DC-R5-08** | -08 | Truck and fuel 100R5 |
| **ET5040DC-R5-10** | -10 | Truck and fuel 100R5 |
| **ET5040DC-R5-12** | -12 | Truck and fuel 100R5 |
| **ET5040DC-R5-16** | -16 | Truck and fuel 100R5 |
| **ET5040DC-R5-20** | -20 | Truck and fuel 100R5 |
| **ET5040DC-R5-24** | -24 | Truck and fuel 100R5 |
| **ET5040DC-R5-32** | -32 | Truck and fuel 100R5 |

### Crimp machine part numbers

**ET5050-001-230/ET5050-001-230KT***
**ET5050-001-380/ET5050-001-380KT***
**ET5050-001-400/ET5050-001-400KT***
**ET5050-001-420/ET5050-001-420KT***
**ET5050-001-440/ET5050-001-440KT***
**ET5050-001-460/ET5050-001-460KT***
**ET5050-001-480/ET5050-001-480KT***

*All KT part numbers come with the machine, calibration tooling, die installation tool, standard die package, adapter die package, double foot pedal and machine mounted storage rack



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# ET5050

## Industrial production crimp machine

### Pump part numbers

All pumps are included with machine purchase. To review machine and pump package options please refer to the following ordering options.

### Accessory part numbers

***ET5040C-0001†**
Adapter die package (Supplied with ET5050 crimp machines. Required for use with ET5040DC style dies and used to calibrate machine.)

***ET5040C-0004**
Die installation tool

**ET5040C-0006**
Automatic backstop

**ET5040C-0007**
Manual backstop

**ET5050C-0009**
Viewing mirror

***ET5040C-0014**
Machine mounted die storage rack (includes insert holders)

**ET5040C-0016**
Table top die storage rack (includes insert holders)

***ET5040C-0019†**
Calibration tool (supplied with ET5050 crimp machines)

***ET5040C-0020**
Double pedal foot switch

***ET5040C-0023**
Includes 11 of the most popular standard ET5040DC style die sets

**ET5040DC-M320S†**
32mm die set

**ET5040DC-MXXX**
Standard die sets

**ET5040PBL-MXXX**
Large bore industrial hose die sets

**ET4001C-0017**
Magnetic work lamp

*Components included in machine kit packages "KT"

†Calibration tooling (supplied with all ET5050 base machines)

Please note that ET5050 shares dies, crimp components, and some accessories with the ET5040

### Ordering options

**Tooling can also be ordered a la carte.** Visit the Danfoss PowerSource Crimp Specs tool at danfoss.com/crimp to find the tooling needed for all of the hoses and fittings you plan to crimp.

ET5050 ordering

| Select a machine kit | Kit includes | Pump included |
|---|---|---|
| **ET5050-001-230KT** | ET5050-001-230 machine, calibration tooling, die installation tool, standard die package, adapter die package, double foot pedal and machine mounted storage rack | 230v 3 phase pump included |
| **ET5050-001-380KT** | ET5050-001-380 machine, calibration tooling, die installation tool, standard die package, adapter die package, double foot pedal and machine mounted storage rack | 380v 3 phase pump included |
| **ET5050-001-400KT** | ET5050-001-400 machine, calibration tooling, die installation tool, standard die package, adapter die package, double foot pedal and machine mounted storage rack | 400v 3 phase pump included |
| **ET5050-001-420KT** | ET5050-001-420 machine, calibration tooling, die installation tool, standard die package, adapter die package, double foot pedal and machine mounted storage rack | 420v 3 phase pump included |
| **ET5050-001-440KT** | ET5050-001-440 machine, calibration tooling, die installation tool, standard die package, adapter die package, double foot pedal and machine mounted storage rack | 440v 3 phase pump included |
| **ET5050-001-460KT** | ET5050-001-460 machine, calibration tooling, die installation tool, standard die package, adapter die package, double foot pedal and machine mounted storage rack | 460v 3 phase pump included |
| **ET5050-001-480KT** | ET5050-001-480 machine, calibration tooling, die installation tool, standard die package, adapter die package, double foot pedal and machine mounted storage rack | 480v 3 phase pump included |



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# Specialty tooling kit

The Danfoss tools listed are offered in kits for any given hose type, or collets and tools can be purchased individually by catalog number. Visit danfoss.com/crimp to find the tooling needed for all of the hoses and fittings you plan to crimp.

## T-400-66

**069 'E' Series collet kit**

This kit can be used with the following machines: T-420, ET4001

Spacer Rings not included in T-400-66 kit.

**Kit includes one each of the following:**

| Kit includes one of each of the following | |
|---|---|
| Part # | Description |
| **T-400-54C** | Collet – 3/16" |
| **T-400-56C** | Collet – 5/16" |
| **T-400-57C** | Collet – 13/32" |
| **T-400-58C** | Collet – 1/2" |
| **T-400-59C** | Collet – 5/8" |
| **T-400-60C** | Collet – 7/8" |
| **T-400-61C** | Collet – 1-1/8" |



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| General repair & replacement items | |
|---|---|
| Part # | Description |
| **T-400-G** | 1.5 oz. Tube high efficiency PTFE grease |
| **FF91455** | 16 oz. Can, high efficiency PTFE grease |

| ET1000 repair & replacement items | |
|---|---|
| Part # | Description |
| **ET1000C-0001** | Stand |
| **ET1000C-0006** | Pusher |
| **ET1000AR-001** | Adapter ring |
| **ET1000C-0021** | Wall mount bracket |
| **ET1000C-0012** | Pusher extension |

| ET4001 repair & replacement items | |
|---|---|
| Part # | Description |
| **ET4001C-0017** | Gooseneck lamp, magnetic mount |
| **T-410-1M** | Micro switch |
| **ET4000AR-001** | Base adapter ring |
| **ET4000AR-002** | Base adapter ring |
| **ET4000TP-0001** | Locator bracket kit |
| **ET4000TP-0002** | Wear plate kit |
| **ET4001C-0015** | Shroud |
| **120-00429** | Screw, hex head (8) |
| **FF91042** | Cart for ET4001 or T-420 |

| T-420 repair & replacement items | |
|---|---|
| Part # | Description |
| **T-420-1M** | Micro-switch for T-420-1 press |
| **T-420-28** | Tool locator bracket |
| **T-420-B** | Tool locator bracket |
| **W-EQCR-TE006-E** | Shroud decal |
| **T-420-H** | Handle |
| **T-420-L** | Light bulb |
| **T-420-LA** | Light assembly |
| **T-420-LS** | Light switch |
| **AN436777624684n-000101** | Instructions for T-420-1 |
| **T-420-P** | Pusher set (2) with wear plates and screws |
| **T-420-S** | Press shroud with decals |
| **T-420-26** | Insert – base plate |
| **T-420-G** | Linkage assembly |
| **T-420-2R** | Rack |
| **T-420-2K** | Pinion shaft assembly<br>(incl'd T-420-2G, T-420-2R and T-420-2S) |
| **T-420-2S** | Replacement pinion gear shaft |
| **140-06745** | Pusher wear plates includes<br>(1) left and (1) right |
| **140-06748** | Pusher wear plates screws (1) |
| **FF91042** | Cart for ET4001 or T-420 |

| T-450/T-465 repair & replacement items | |
|---|---|
| Part # | Description |
| **T-450-D1** | Spacer ring selector decal for nylon hose<br>(H009, H209, H243, H435, and H436) |
| **T-450-P** | Pusher |
| **T-450-Q** | Quick disconnect coupling |
| **T-450-K** | Pusher and retainer plate repair kit:<br>Includes: T-450-B Pusher bolt (1)<br>T-450-R Retainer plate (1)<br>T-450-S Retainer plate screw (2) |
| **W-EQCR-TE011-E** | Shroud decal |

| T-464 repair & replacement items | |
|---|---|
| Part # | Description |
| **AP432452437325en-000101** | Instructions |
| **T-460-SPR** | Slide pull rod |
| **T-460-16** | Hose assembly |
| **T-460-2** | Hand pump |
| **W-EQCR-TE009-E** | Shroud decal |
| **T-460-P** | Pusher |
| **T-460-SF** | Slide flange |
| **T-460-SP** | Slide plate |
| **T-460-SPK** | Slide pull knob |

| T-466 repair & replacement items | |
|---|---|
| Part # | Description |
| **W-EQCR-TM008-E** | Instructions |
| **T-460-P** | Pusher |
| **T-460-SF** | Slide flange |
| **T-460-SP** | Slide plate |
| **W-EQCR-TE010-E** | Shroud decal |
| **140-06675** | Air regulator kit |
| **T-460-SPK** | Slide pull knob |
| **T-460-SPR** | Slide pull rod |
| **T-462-16** | Hose assembly |
| **T-462-V** | Regulator only |
| **T-462-2** | Air/hydraulic pump |

See pages 292 - 295 for replacement pumps.

Reference page 289 for specialty tooling and collet kits.
For individual tooling items, such as collets, spacer rings, machine bowls, and adapter rings, visit danfoss.com/crimp or contact Danf

Refer to the applicable machine operator's manuals for safety information.

Additional repair and replacement items are available. Refer to the owner's manual or contact Danfoss for information.



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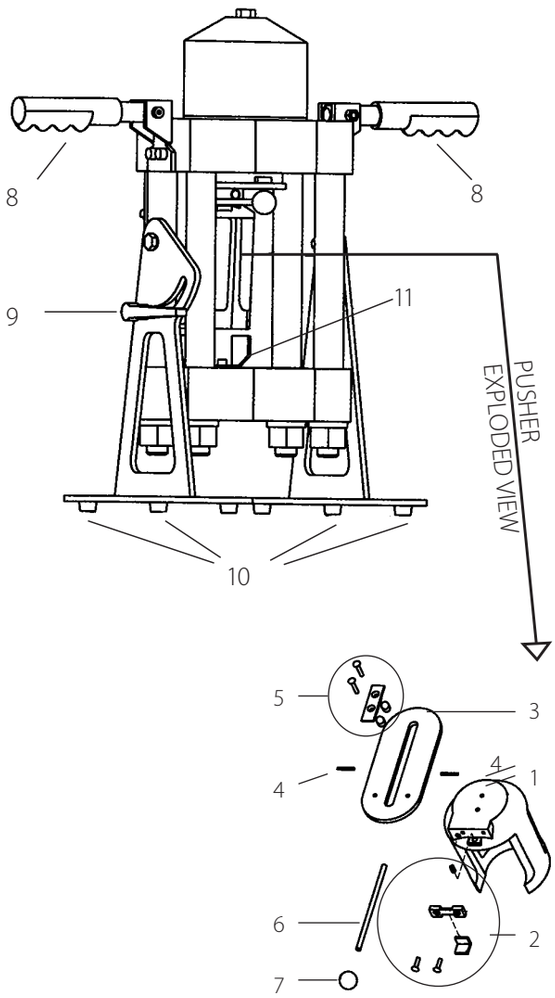
## Repair and replacement items

T-480 portable crimp machine repair and replacement items




| T-480 portable crimp machine repair & replacement items | | |
|---|---|---|
| # | Part # | Description |
| 1 | **T-480-P** | Pusher |
| 2 | **T-480-PSK** | Pusher stop repair kit (Includes pusher clip, 2 machine screws, pusher stop & spring) |
| 3 | **T-480-SP** | Slider plate |
| 4 | **140-05485-01** | Roll pin |
| 5 | **T-480-SFK** | Slide flange kit (Includes slide flange, 2 bushings and 2 machine screws) |
| 6 | **T-480-SPR** | Slide pull rod |
| 7 | **T-480-SPK** | Slide pull knob |
| 8 | **140-06601** | Vinyl grip |
| 9 | **T-480-TBK** | Tilt bracket knob |
| 10 | **140-06894** | Foot pad |
| 11 | **T-480-69** | Tool locator bracket |
| # | **T-480-16** | 10,000 PSI replacement hose assembly for 480-HP |
| # | **T-480-17** | 10,000 PSI replacement hose assembly for T-480-TA and T-480-EP |
| # | **T-480-18** | 10,000 PSI replacement hose assembly for 480-AH |
| # | **140-06906** | Hydraulic quick coupler used with the T-480-TA and T-480-EP system |
| # | **T-480-3** | Turbo air/hydraulic replacement pump for T-480-TA system |
| # | **T-481-110** | Electric replacement pump for T-480-EP system |
| # | **T-480-2** | Hand replacement pump for T-480-HP system |
| # | **T-482-2** | Air/hydraulic replacement pump for T-480-AH system |
| # | **W-EQCR-TE012-E** | Shroud decal |
| # | **BC425482205281en-000101** | Set-up and operating guide for T-480 system |

# Item not illustrated in parts breakdown.

| T-400-1 crimp machine repair & replacement items | |
|---|---|
| Part # | Description |
| **T-400-B** | Pusher bolt |
| **T-400-BB** | Switch to interface T400-1 crimper to T421U pump or T-421U-110 pump. Upgraded solid state relay can be purchased through Lomar. Part number 140-06761-SS. |
| **T-400-G** | 1.5 oz. Tube high efficiency * grease |
| **T-400-K1** | Seal replacement kit for T-400-1 press |
| **W-EQCR-TD003-E** | Shroud decal |
| **T-400-M** | Instructions for T-400-1 |
| **T-400-S** | Replacement press shroud with decals |
| **T-400-8** | Die ring |
| **T-400-13** | Replacement** collet cage for T-400 "U" Series collets, 1/4" and 3/8" sizes only, and 229 "P" series collets, all sizes, with a 'C' suffix. |
| **T-400-14** | Replacement** collet cage for T-400 "U" Series collets with a "C" suffix, 1/2" through 1" only |
| **T-400-19** | 60" Hose assembly and fittings |
| **T-400-90** | Replacement** collet cage for T-400 "E", 069 "E", and "E" Series collets with a "C" suffix. |
| **T-432-15** | Pusher |

** 2 required for each collet



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# T-403-2
## Hand pump

For use with T-400-1.

**Pump specifications:**

**Dimensions** :
7 high, 21" long, 4-3/4" wide

**Weight** :
9 lbs.

**Operation pressure** :
4000-4200 PSI

**Reservoir capacity:**
1 qt.

**Outlet port size:**
3/8"

**NPT hydraulic oil:**
Use Enerpac oil ONLY

**Note:**
For repair and replacement items for the following pumps please contact an Enerpac distributor at
**www.enerpac.com:** T-402-2, T-403-2, T-481-110 & T-482-2.

# T-460-2
## Hand pump

For use with T-450-1, T-460 and T-465.

**Pump specifications:**

**Dimensions:**
5-5/8"High, 13-1/4" long, 3-3/4" wide

**Weight:**
4-1/2 lbs.

**Operation pressure :**
0-10,000 PSI

**Reservoir capacity :**
20 cu in.

**Relief valve setting :**
10,000 PSI

**Hydraulic oil:**
Use Enerpac oil ONLY

**Note:**
For repair and replacement items for the following pumps please contact an Enerpac Distributor at
**www.enerpac.com:** T-402-2, T-403-2, T-433, T-460-2, T-462-2, T-480-2, T-480-3, T-481-110 & T-482-2.

# T-480-2
## Two-stage hand pump

For use with T-480-HP, ET1000.

**Pump specifications:**

**Dimensions:**
7-3/16" high x 21-1/64" long x 4-3/4" wide

**Weight:**
10 lbs.

**Operation pressure :**
0-10,000 PSI

**Hydraulic oil** :
Use Enerpac oil ONLY

| Repair and replacement items for discontinued T-401-1 pump | |
|---|---|
| Catalog # | Description |
| T-401-1BC | Breather cap for Fenner-Stone pumps |
| T-401-1S | Toggle switch |
| T-401-SVF | Shuttle valve for Fenner-Stone pump |



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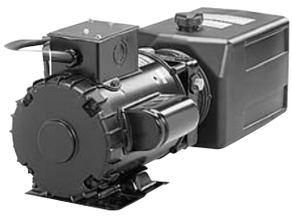
# T-421U

**Electric pump (220 volt)**

For use with T-400-1 and T-420-1.



**Pump specifications:**

**Dimensions:** 7-1/2" high, 22" long, 10" wide

**Weight :** 75 lbs.

**Operation pressure:** 4000-4200 PSI

**Reservoir capacity**: 6 quarts

**Outlet port size**: 3/4"-16 Straight Thread

**Motor:** 1 H.P., 3450 R.P.M., 220 volts, 60 cycle, single phase
At 50 Hertz, RPM = 2,850
At 60 Hertz, RPM = 3,450

**T-421UCSA:** CSA approved

**Hydraulic oil*:** ISO 32 hydraulic oil or (ATF) automatic transmission fluid

**Flow:** 2.5 GPM @ 750 PSI, 0.5 GPM @ 4000 PSI

*For low temperature applications automatic transmission fluid can be substituted.

| Replacement parts: | |
|---|---|
| Catalog # | Description |
| 140-06761 | Relay for T-421U, T-441 and T-441 pumps only |
| T-421U-BC | Breather cap - twist lock |
| T-421-FP | 220v 4 wire female electrical receptacle |
| T-401-1BC | Breather cap - threaded |

**Note:** It is recommended that the electric pump be used on a 15 amp. fused circuit. Pump wired for 220 volts, single phase.

# T-421U-110

**Electric pump (110 volt)**

For use with T-400-1 and T-420-1.

For dimensional data other than voltage information, refer to T-421U see above.

**T-421U-110CSA**
CSA approved

**Note:** It is recommended that the electric pump be used on an individual 30 amp. fused circuit. Pump wired for 110 volts, single phase.

**Note:** Upgraded solid state relay can be purchased through Lomar, part #: 140-06761-SS.

# T-481-110

**Electric pump (110 volt)**

For use with T-480-EP, ET1000 and ET1187.

**Pump specifications:**

**Dimensions:** 14-14" High, 9-5/8" long, 9-5/8" wide

**Weight:** 32 lbs.

**Operation pressure:** 0-10,000 psi

**Hydraulic oil** : Use Enerpac oil ONLY

# ET4001P-002

**Electric pump (220 volt)**

For use with ET4001 press.

It features a two-stage pump providing high flow at low pressure for fast ram approach and low flow at high pressure for actual crimping.

**Pump specifications:**

**Dimensions**: 7½" high, 10" wide, 22" long

**Weight** 75 lbs.

**Operation pressure** 5,000 psi

**Reservoir capacity** 6 quarts

**Outlet port size** ¾-16 Straight thread O-Ring

**Motor** 1HP, 3450 RPM, 220 volts, 60 cycle, single phase

**Hydraulic oil** ISO 32 (SAE 10W)

**Flow** 2.6 GPM to 900 psi. 0.6 GPM above 900 psi

**CAUTION:** The ET4001P-002 electric pump has the relief valve set at 5,000 psi. Damage to the press will result and the warranty may be voided if higher pressures are used. Requires individual 20 amp service breaker (220 v).



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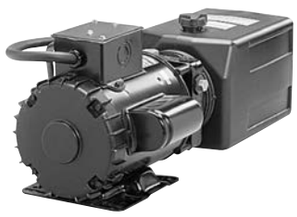
# T-441

## Electric pump (220 volt)

For use with T-440-1 and ET4000 only.



The T-441 power unit features a two-stage pump providing high flow at low pressure for a fast ram approach and low flow at high pressure for actual crimping.

### Pump specifications:

**Dimensions**: 7-1/2" high, 22 " long, 10" wide

**Weight:** 75 lbs.

**Operation pressure:** 5,000 PSI

**Reservoir capacity:** 6 quarts

**Outlet port size :** 3/4-16 Straight thread O-Ring

**Motor:** 1 H.P., 3450 R.P.M., 220 volts, 60 cycle, single phase

**Hydraulic oil:** ISO 32 hydraulic oil automatic transmission fluid

**Flow:** 2.5 GPM @ 750 PSI, 0.5 GPM @ 5000 PSI

| Replacement parts: | |
|---|---|
| Catalog # | Description |
| **T-421U-BC** | Breather cap |
| **T-421-FP** | 220v 4 wire female electrical receptacle |
| **140-06761** | Relay for T-421U or T-421U-110 pumps |

**Note:** T-441 pump is to be used with the T440-1 and ET4000 press only. When replacing the pump on a standard T-410 press (without the black switchbox on the side of the press) refer to the repair and replacement items on page 290.

# T-402-2

## Air/hydraulic pump

For use with T-400-1.

### Pump specifications:

**Dimensions** : 5-1/4" high, 12-1/2" long, 5" wide

**Weight:** 18 lbs.

**Operation pressure:** 4000-4200 PSI

**Reservoir capacity:** 606 ml.

**Hydraulic oil:** Use Enerpac oil ONLY

**Outlet port size:** 3/8" NPT

**Inlet (air) port size** : 1/4" NPT

**Inlet air pressure required :** 60 to 120 PSI

**Note:** It is recommended that a filter, regulator, lubricator, and air pressure gauge be installed in the air line as close as possible to the pump. Filter, regulator, and lubricator units not included.

Some models have air port on right side.

# T-482-2

## Air/hydraulic pump

For use with T-480-AH, ET1000.

### Pump specifications:

**Dimensions:** 5" High, 14-5/8" long, 5-5/8" wide

**Weight:** 12 lbs.

**Operation pressure :** 0-10,000 psi

**Hydraulic oil:** Use Enerpac oil ONLY



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Crimp machine power units

# T-462-2

## Air/hydraulic pump

For use with T-462.

The T-462-2 power unit is a air/hydraulic pump designed for use with the T-462 portable system. Ideal if you have the availability of compressed air in your shop or in the field via a portable compressor.

### Pump specifications:

**Dimensions** :
4" high, 13" long

**Weight:**
8 lbs.

**Operation pressure:**
0-10,000 PSI

**Reservoir capacity :**
10 cu in.

**Relief valve setting** :
10,000 PSI

**Hydraulic oil** :
Use Enerpac oil ONLY

Regulator to be set for
100-120 PSI inlet air

# T-480-3

## Turbo air/ hydraulic pump

For use with T-480-TA.

### Pump specifications:

**Dimensions:**
8-1/4"High x 12-3/8" long x
8" wide

**Weight:**
16-1/2 lbs.

**Operation pressure:**
0-10,000 PSI

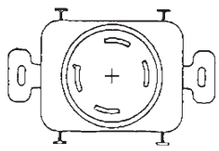
**Hydraulic oil:**
Use Enerpac oil ONLY

For repair and replacement items for the following pumps please contact an Enerpac Distributor at **www.enerpac.com**:
T-402-2, T-403-2, T-460-2, T-462-2, T-480-2, T-480-3, T-481-110 & T-482-2.

# T-421-FP

## 4-Prong female electrical outlet

All 220v pumps are equipped with a four prong electrical outlet as illustrated.



To obtain corresponding female wall receptacle order T-421-FP.
For use with T-421U, T-441 and T-433 pumps.



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# T-420-GT

**Gates PC707 conversion kit**

The T-420-GT conversion kit is designed to allow the use of standard Danfoss tooling, hose, and hose ends in the Gates PC707 crimper. Everything is included to convert the crimper to accept Danfoss tooling. This kit gives the crimper capacity to crimp up to and including 1-1/4"I.D. 4 wire spiral hose factory-type hose assemblies.

**T-420-GT Kit includes:**

- Shroud
- Adapter ring
- (2) Locater pins
- ET425SR-015D spacer ring
- Assembly Instructions

# T-400-MK

**Parker Minikrimp conversion kit**

The T-400-MK conversion kit is designed to allow the use of standard Danfoss tooling, hose, and hose ends in the Parker Minikrimp crimper. Everything is included to convert the crimper to accept Danfoss tooling. This kit gives the crimper capacity to crimp up to and including 5/8" I.D. 2 wire braided and 5/8" I.D. 4 wire spiral factory-type hose assemblies.

For installation, simply remove the pusher, snap ring, spring, and die cage separator from the crimper. Then, insert the adapter bowl and reinstall the pusher.

Capabilities and crimp specs are based on the Danfoss T-400 machine, but please note that a spacer ring is required for every crimp. The included ET313SR-FLAT-CLR spacer ring should be used.

**T-400-MK Kit includes:**

- ET313AR-PK adapter bowl
- ET313SR-FLAT-CLR spacer ring
- Grease
- Vinyl wrap to cover shroud
- Danfoss decal
- Instruction sheet
- Caution decal
- Serial number decal
- Core hose crimp chart
- FF91761 Rust-oleum Gloss Charcoal Gray Spray Paint

# T-420-KK

**Parker Karrykrimp conversion kit**

The T-420-KK conversion kit is designed to allow the use of standard Danfoss tooling, hose, and hose ends in the Parker Karrykrimp 1 and Karrykrimp 2 crimpers. Everything is included to convert the crimper to accept Danfoss tooling. This kit gives the crimper capacity to crimp up to and including 1" I.D. braided hose and 5/8" I.D. 4 wire spiral hose for the Karrykrimp 1 and up to and including 1 ¼" I.D. 4 wire spiral hose for the Karrykrimp 2.

**T-420-KK Kit includes:**

- ET425AR-PK
- (2) 2-1/2" roll pins
- ET1000C-0012 spacer ring
- Grease
- Vinyl wrap to cover shroud
- Danfoss decal
- Caution deal
- Serial number decal
- Core hose crimp chart
- Assembly instructions
- FF91761 Rust-oleum Gloss Charcoal Gray Spray Paint

Refer to the applicable machine operator's manuals for safety information.



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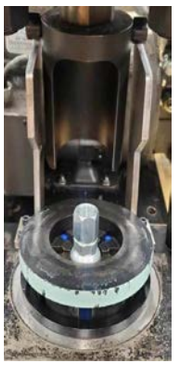
# T-420-PK

## Parker Parkrimp conversion kit



The T-420-PK conversion kit is designed to allow the use of standard Danfoss tooling, hose, and hose ends in the Parker Parkrimp 1 crimper. Everything is included to convert the crimper to accept Danfoss tooling. This kit gives the crimper capacity to crimp up to and including 1" I.D. braided hose and 5/8" I.D. 4 wire spiral hose.

### T-420-PK Kit includes:

- ET425AR-PK
- ET1000C-0012 Spacer
- Grease Tube
- Vinyl Wrap
- Danfoss Decal
- Instruction Sheet
- Caution Decal
- Serial Number Decal
- Core Hose Crimp Chart
- Spacer Dowels
- Right Cam Ramp
- Left Cam Ramp
- FF91761 Rust-oleum Gloss Charcoal Gray Spray Paint



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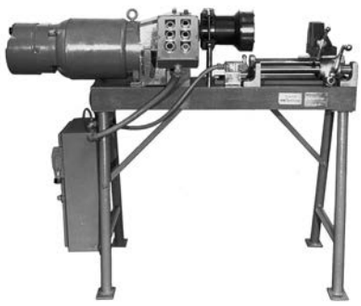
# FT1028

## Production reusable hose assembly machine



### Fitting Specifications

- Screw together fittings:
  Fabric or wire braided hose up to –32 four-spiral wire hose up to –24

### Features

- High volume production
- Ideal for 2 or 3 piece fittings
- 4 speed transmission; 90 rpm, 120 rpm, 210 rpm, 400 rpm
- Easy to operate
- Micrometer stop
- Electric brake
- U.L. listed
- 24" x 62" x 32", 550 lbs.

### Electrical requirements

220/440V, 3 phase, 60 Hz.

### Ordering instructions

FT1028–1–5 Base machine

# FT1234

## Drop-in socket holder

### Specifications

Designed for use with the FT1028 assembly machine, the FT1234 drop-in socket holder prevents rotation of the socket during assembly and provides a back stop to ensure consistent location of the socket.

FT1234 drop-in socket holder

| Part # FT1234 | Hex Size (inches) | Hose style | Socket part # and size |
|---|---|---|---|
| –100 | 9/16 | 2807–4 | 1206–4 |
| –101 | 5/8 | 2807–5, 1503–4, FC300–04, FC350–04, FC321–04 | 1206–5, 1210–4 |
| –102 | 11/16 | 2807–6, 1503–5, FC300–5, FC350–5, FC321–05 | 1206–6, 1210–5 |
| –104 | 13/16 | 1503–6, 1509–4, FC300–6, FC350–6, FC321–06 | 1210–6, 4010–4 |
| –105 | 7/8 | 2807–8 | 1206–8 |
| –106 | 15/16 | 1503–8, FC300–08, FC350–08, FC321–08 | 1210–8 |
| –200 | 1 | 2807–10 | 1206–10, FC3214–10 |
| –201 | 1 | 1509–6, 1 508–6 | 4007–6, 4010–6, 4013–6 |
| –202 | 1-1/8 | 1503–10, 1509–8, 1508–8, FC300–10, FC350–10, FC321–10 | 4013–8 |
| –203 | 1-1/8 | 2807–12 | 1206–12 |
| –204 | 1-1/4 | 1503–12, 1509–10, FC300–12, FC350–12 | 1210–12, 4010–10 |
| –205 | 1-3/8 | 2807–16 | 1212–16, FC3214-16 |
| –206 | 1-7/16 | 1503–16, FC300–16, FC350–16, FC321–16 | 1212–16 |
| –207 | 1-1/2 | 1508–12 | 4007–12, 4013–12 |
| –208 | 1-5/8 | | FC3214–20 |
| –209 | 1-3/4 | 1503–20, FC300–20, FC350–20 | 1212–20 |

# FT1033

## Assembly mandrels

### Specifications

Designed for use with the FT1028 assembly machine, the FT1033 assembly mandrels. Secured in the chuck they speed the volume production of Danfoss three piece reusable hose fittings.

FT1033 assembly mandrels

| Part # | Fitting # |
|---|---|
| FT1033–1 | FC9215–0404 |
| FT1033–2 | FC9215–0504 |
| FT1033–3 | FC9215–0808 |
| FT1033–4 | FC9215–0506 |
| FT1033–5 | FC9215–1010 |
| FT1033–6 | FC9210–0606 |
| FT1033–7 | FC9210–1212 |
| FT1033–8 | FC9211–0606 |
| FT1033–9 | FC9211–1212 |
| FT1033–10 | FC9211–1616 |
| FT1033–11 | FC9211–2020 |
| FT1033–13 | FC9212–0204<br>FC9212–0404<br>FC9216–0404 |
| FT1033–14 | FC9212–0406<br>FC9212–0606 |
| FT1033–15 | FC9212–0608<br>FC9212–0808 |
| FT1033–16 | FC9212–0810 |
| FT1033–17 | FC9212–1212 |
| FT1033–18 | FC9212–1616 |
| FT1033–19 | FC9212–2020 |
| FT1033–21 | 411–4, 401–4 |
| FT1033–22 | 411–5, 401–5 |
| FT1033–23 | 401–6 |
| FT1033–24 | 411–6 |
| FT1033–25 | 411–8, 401–8 |
| FT1033–26 | 411–10, 401–10 |
| FT1033–27 | 401–12 |
| FT1033–28 | 411–12 |
| FT1033–29 | 406–16 |
| FT1033–30 | 411–16 |
| FT1033–31 | 406–20 |
| FT1033–32 | 411–20 |
| FT1033–33 | 406–24 |
| FT1033–34 | 411–24 |
| FT1033–35 | 406–32 |
| FT1033–36 | 411–32 |
| FT1033–37 | 412–2–4, 412–4–4 |
| FT1033–38 | 412–4–5 |
| FT1033–39 | 412–4–6 |
| FT1033–40 | 412–6–12 |
| FT1033–41 | 412–8–10, 412–12–10 |
| FT1033–42 | 412–12–12 |



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# FT1220–10

## Reusable fitting assembly mandrels

### Specifications

The FT1220–10 kit includes all assembly mandrels listed for –4 through –20 for the assembly of Danfoss 411, 401, and 406 reusable hose fittings. Individual mandrels may also be ordered by using the part numbers to the right.

| FT1220–10 | | | |
|---|---|---|---|
| Use with fitting #s | SAE 37° (JIC) 411 | SAE 45° PTT 401 | 30° 406 |
| Dash size | | | |
| –4 | 1582–4S | 1582–4S | |
| –5 | 1582–5S | 1582–5S | |
| –6 | 583–6S | 1582–6S | |
| –8 | 1582–8S | 1582–8S | |
| –10 | 1582–10S | 1582–10S | |
| –12 | 583–12S | 1582–12S | |
| –16 | 1563–16S | | 1561–16S |
| –20 | 1563–20S | | 1561–20S |
| –24 | 1563–24S | | 1561–24S |
| –32 | 1563–32S | | |

| FT1220–10 kits | | | |
|---|---|---|---|
| Kit part # | Fitting part # | Thread types | Size range |
| 1562 (not shown) | 401, 406, 411, 412 | SAE 45°, SAE 37° (JIC), PTT, NPTF | –4 to –32 |
| 1597 (not shown) | 401, 412 | SAE 45°, NPTF | –4 to –12 |
| 1598 (not shown) | 411, 412 | SAE 37° (JIC), NPTF | –4 to –32 |
| 1599 (not shown) | 411, 412 | SAE 37° (JIC), NPTF | –4 to –12 |
| FT1220–10 | 401, 406, 411, 412 | SAE 45°, SAE 37° (JIC), PTT, NPTF | –4 to –20 |

# FT1038A

## PTFE hose tool

### Hose specifications

Smooth bore PTFE Hose,
–03, –04, –05, –06, –08, –10 and –12

### Features

- Small
- Hand held tool

### Ordering instructions

FT1038A PTFE hose tool (–03 thru –12)

FT1038B PTFE hose tool (–16, –20)

# F2015

## SOCKETLESS fitting bench mounted assembly machine

### Hose specifications

SOCKETLESS hose, all sizes

### Features

- Fast, hand assembly
- Bench mounted
- Hose is securely held
- Mandrels included

### Ordering instructions

F2015 Complete machine



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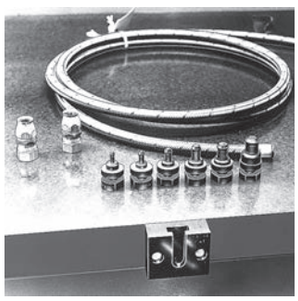
# FT1081

## PTFE hose assembly tool kit



### Hose specifications

Smooth bore PTFE hose, –03, –04, –05, –06, –08, –10 and –12 hose. FT1090–3–10–4 and FT1090–3–10–5 are useful wire flare tools to use in conjunction with kit FT1081.

### Features

- Inexpensive
- Easy to use
- Seats PTFE tube against sleeve

### Ordering instructions

FT1081 Complete tool kit

**Includes:**

| | |
|---|---|
| FT1081–3–1 | Mandrel holder |
| FT1081–3–2–3 | Mandrel –3 hose |
| FT1081–3–2–4 | Mandrel –4 hose |
| FT1081–3–3–5 | Mandrel –5 hose |
| FT1081–3–4–6 | Mandrel –6 hose |
| FT1081–3–5–8 | Mandrel –8 hose |
| FT1081–3–6–10 | Mandrel –10 hose |
| FT1081–3–7–12 | Mandrel –12 hose |
| FT1081–16 | Mandrel –16 hose |
| FT1081–20 | Mandrel –20 hose |

# 4523-04006

## Hand-held hose cutter

Handy tool for cutting Danfoss Synflex hose 1/8-inch to 1/2-inch in diameter. Blades are replaceable. Vinyl cushioned grips

### Replacement blade

Part #: 4523-04005

# 4523-04007

## Bench top cutter

The 4523-04007 bench top cutter is ideal for production of thermoplastic and other fabric reinforced hose style assemblies.

# 4574-01000

## Twin-line hose separation tool

Designed for separating Twin-Line hose

### Replacement blade

Part #: 4574-02000

# FT1258

## Bench mount cut off tool

The FT1258 bench mounted cut off tool is ideal for production of thermoplastic and other fabric reinforced hose style assemblies.

### Replacement blade

Part #: FT1258-2-2

# 222070

## Assembly lube, one pint

Specially compounded petroleum based hose assembly lubricant.

### Gallon size

Part #: 222070-8



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## 4573-00000
### Multi-line hose separation tool

Designed for separation of tri-, quad- and five-line hose

**Replacement blade**
Part #: 4523-04005

## T-191
### Plastic tube and hose cutter

Only 2-7/8" long, the versatile T-191 offers quick and clean square cuts on 1/16" to 1/2" O.D. plastic tubing and non-wire reinforced hose. The T-191 can be either bench or wall mounted and offers the safety of closing automatically when not in use.

**Replacement blade**
Part #: T-191B
(one per package)

## FT1341
### Thread measuring kit

Measuring tube and pipe fitting threads can be a most difficult task if not completely understood. Tools needed include a thread pitch gauge, calipers and seat angle gauges. To aid you, Danfoss has a kit to fit your needs; the FT1341 thread measuring kit.

**This handy kit includes:**

- Thread pitch gauge (Imperial and metric)
- Inside/outside caliper (inches and millimeters)
- 2 seat angle gauges (37°/45° and a 12°/30° )
- How to identify fluid ports and connectors bulletin
- Carrying case for easy and convenient storage

Weight: .5 lb.



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Aeroquip by Danfoss

# Hose prep

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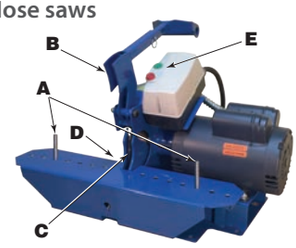
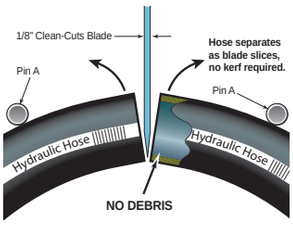
# ET9000, ET9100, ET9200 & ET9300 series

## Hose saws




**Clean Cuts • Less Smoke • Longer Life**

ET9100/200/300 hydraulic hose cutting system is break-through technology using a toothed blade, cutting with the backs of each tooth, so the blade does not take a kerf. The saw bends the hose into the blade spreading the cut edges to avoid burning and smoking.

**How it works**

With the ET9100/200/300 hydraulic hose saws the hose is positioned across two pins (A) and moved into the blade (C) by a feed foot (B) using a pulldown handle for better leverage on heavy hose. The feed motion causes the hose to stretch at the point of contact with the blade, allowing it to separate as it is cut (see image at right). This separation allows the hose to pass clear of the saw blade with NO friction, NO heating and NO DEBRIS! A vacuum hose (not shown) is attached to a vacuum port (D) to remove any tiny amount of debris or smoke during cutting. Improved safety using a 110V on/off switch (E) with a magnetic contactor. When power is lost, the saw will not turn back on independently. Comes with advanced scalloped blade.

**WARNING** ⚠

The user must exercise extreme care when operating any Danfoss assembly equipment with powered moving components. Safety glasses must be worn at all times when using any Danfoss assembly equipment.

Read and understand the owners and operators manual before attempting to operate any equipment.

Danfoss personnel are available to answer any questions, please call:

**Danfoss,**
14615 Lone Oak Road,
Eden Prairie, MN 55344,
952-937-9800.

Danfoss assembly equipment is designed to be used only with Danfoss hose and Danfoss hose fittings.

# ET9000 series

| ET9000 series saw | | | |
|---|---|---|---|
| Model | Motor | 4-1/2" inch Blade | Cutting capacity |
| **ET9000-45-110** | 1 HP, 115 VAC (1 Phase), 60 Cycle, 7.5 amp, 11,000 RPM | 4-1/2" OD x 0.070 THK x 5/8" arbor | 3/4" ID x 2 wire braid hydraulic hose |

* Requires 15 Amp Circuit †Canadian Standards Association Rated
* ET9000 saws ship with micro-slotted blade.

| ET9000 series saw blade | | | |
|---|---|---|---|
| Model | Type | Blade | Cutting capacity |
| **ET9000C-45-MS** | Micro-slotted blade | 4-1/2" OD x 0.070 THK x 5/8" arbor | 3/4" ID x 2 wire braid hydraulic hose |



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# ET9100 series

| ET9100 series saws | | | |
|---|---|---|---|
| Model | Motor | 7 inch Blade | Cutting capacity |
| **ET9100-07-110** | 1-1/2 HP, 110 VAC (1 Phase), 60 Cycle, 17** Amp, 3,430 RPM | 7" OD x .093 THK x 3/4" arbor | 1-1/4" ID x 4 wire hydraulic hose |
| **ET9100-07-110CSA†** | 1-1/2 HP, 110 VAC (1 Phase), 60 Cycle, 17** Amp, 3,430 RPM | 7" OD x .093 THK x 3/4" arbor | 1-1/4" ID x 4 wire hydraulic hose |
| **ET9100-07-22060** | 2 HP, 220 VAC (1 Phase), 60 Cycle, 11* Amp, 3,430 RPM | 7" OD x .093 THK x 3/4" arbor | 1-1/4" ID x 4 wire hydraulic hose |
| **ET9100-07-22050** | 2 HP, 220 VAC (1 Phase), 50 Cycle, 11* Amp, 2,865 RPM | 7" OD x .093 THK x 3/4" arbor | 1-1/4" ID x 4 wire hydraulic hose |

* Requires 15 Amp Circuit ** Requires 20 Amp Circuit †Canadian Standards Association Rated
* ET9100 saws ship with advanced scalloped blade.

* Requires 15 Amp Circuit ** Requires 20 Amp Circuit †Canadian Standards Association Rated
* ET9000 saws ship with micro-slotted blade.

| ET9100 series saw blades | | | |
|---|---|---|---|
| Model | Type | Blade | Cutting capacity |
| **ET9100C-07-AS** | Advanced scalloped blade | 7" OD x .093 THK x 3/4" arbor | 1-1/4" ID x 4 wire hydraulic hose |
| **ET9100C-07-MS** | Micro-slotted blade | 7" OD x .093 THK x 3/4" arbor | 1-1/4" ID x 4 wire hydraulic hose |
| **ET9100C-07-SM** | Smooth blade | 7" OD x .093 THK x 3/4" arbor | 1-1/4" ID x 4 wire hydraulic hose |
| **ET9100C-07-SC** | Scalloped blade | 7" OD x .093 THK x 3/4" arbor | 1-1/4" ID x 4 wire hydraulic hose |
| **ET9100C-07-SL** | Slotted blade | 7" OD x .093 THK x 3/4" arbor | 1-1/4" ID x 4 wire hydraulic hose |



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# ET9300 series

| ET9300 series saws | | | |
|---|---|---|---|
| Model | Motor | 14 inch Blade | Cutting capacity |
| **ET9300-14-220** | 5 HP, 220 VAC (1 Phase), 60 Cycle, 21 Amp, 3,490 RPM | 14" OD x .160 THK X 40 mm | 2" ID x 6 wire hydraulic hose ‡ and 5" OD spiral wound hose |
| **ET9300-14-22050** | 3 HP, 220 VAC (1 Phase), 50 Cycle, 11* amp, 3,490 RPM | 14" OD x .160 THK X 40 mm | 2" ID x 6 wire hydraulic hose ‡ and 5" OD spiral wound hose |
| **ET9300-14-220-3** | 3 HP, 220 VAC (3 Phase), 60 Cycle, 11* Amp, 3,490 RPM | 14" OD x .160 THK X 40 mm | 2" ID x 6 wire hydraulic hose ‡ and 5" OD spiral wound hose |
| **ET9300-14-440-3** | 3 HP, 440 VAC (3 Phase), 60 Cycle, 4 Amp, 3,490 RPM | 14" OD x .160 THK X 40 mm | 2" ID x 6 wire hydraulic hose ‡ And 5" OD spiral wound hose |
| **ET9300-14-220-3 CSA †** | 3 HP, 220 VAC (3 Phase), 60 Cycle, 11* Amp, 3,490 RPM | 14" OD x .160 THK X 40 mm | 2" ID x 6 wire hydraulic hose ‡ and 5" OD spiral wound hose |

* Requires 15 Amp Circuit ** Requires 20 Amp Circuit * ET9300 saws ship with advanced scalloped blade.
†Canadian Standards Association Rated ‡ Diamond Blade Recommended for Frequent 6 Wire Cutting

| ET9300 series saw blades | | | |
|---|---|---|---|
| Model | Type | Blade size | Cutting capacity |
| **ET9300C-14-AS** | Advanced scalloped blade | 14" OD x .160 THK X 40 mm arbor | 2" ID x 6 wire hydraulic hose 5" OD spiral wound hose |
| **ET9300C-14-MS** | Micro-slotted blade | 14" OD x .160 THK X 40 mm arbor | 2" ID x 6 wire hydraulic hose 5" OD spiral wound hose |
| **ET9300C-14-D** | Diamond blade | 14" OD x .160 THK X 40 mm arbor | 2" ID x 6 wire hydraulic hose 5" OD spiral wound hose |
| **ET9300C-14-SM** | Smooth blade | 14" OD x .160 THK X 40 mm arbor | 2" ID x 6 wire hydraulic hose 5" OD spiral wound hose |
| **ET9300C-14-SC** | Scalloped blade | 14" OD x .160 THK X 40 mm arbor | 2" ID x 6 wire hydraulic hose 5" OD spiral wound hose |
| **ET9300C-14-SL** | Slotted blade | 14" OD x .160 THK X 40 mm arbor | 2" ID x 6 wire hydraulic hose 5" OD spiral wound hose |



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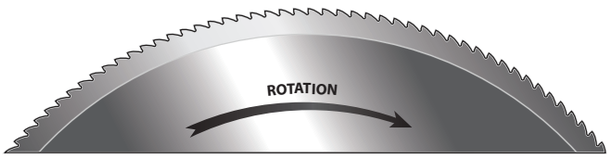
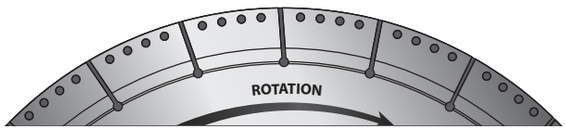



## Advanced scalloped blades

Features advanced performance scalloped knife technology for cutting hydraulic spiral hose and wire helix hose resulting in cleaner cuts, faster cuts, no smoke, and longer blade life. Available in 6" to 14" sizes to fit Aeroquip®, Clean- Cuts™, Custom Crimp®, Gates®, Goodyear®, Imperial Eastman®, Parker®, Stratoflex®, Toledo®, and Weatherhead® saws.

| Advanced scalloped blade | | | | |
|---|---|---|---|---|
| Model | Diameter | Thickness | Arbor | Danfoss saw |
| **ET9500C-06-AS** | 6" | 0.093" | 5/8" | - |
| **ET9500C-07-AS** | 7" | 0.093" | 5/8" | - |
| **ET9100C-07-AS** | 7" | 0.093" | 3/4" | ET9100 |
| **ET9500C-08-AS** | 8" | 0.093" | 5/8" | - |
| **ET9500C-10-AS** | 10" | 0.093" | 3/4" | - |
| **ET9500C-10-1-AS** | 10" | 0.125" | 1" | - |
| **ET9200C-10-AS** | 10" | 0.125" | 40mm | ET9200 |
| **ET9500C-12-AS** | 12" | 0.125" | 1" | - |
| **ET9500C-14-AS** | 14" | 0.125" | 1" | - |
| **ET9300C-14-AS** | 14" | 0.160" | 40mm | ET9300 |




## Diamond hydraulic hose blades

Exclusively designed for cutting heavy 4 and 6 wire hydraulic hoses. This diamond grinding technology cuts down by 60% the debris while cutting heavy hoses very quickly as opposed to using abrasive wheels. You will get a fantastic finish and make 5 – 10 second cuts in 2" hose.

| Diamond hydraulic hose blade | | | | |
|---|---|---|---|---|
| Model | Diameter | Thickness | Arbor | Danfoss saw |
| **ET9200C-10-D** | 10" | 0.125" | 40mm | ET9200 |
| **ET9300C-14-D** | 14" | 0.160" | 40mm | ET9300 |

## Smooth beveled edge hydraulic hose blades

Smooth edge knife designed for the best finish when cutting light duty hoses like single wire braid, textile reinforced, poly or nylon reinforced, and Teflon® fluoropolymer® resin hoses.
Available in sizes 7"-14" to fit Aeroquip®, Clean- Cuts™, Custom Crimp®, Gates®, Goodyear®, Hydroscand®, Imperial Eastman®, O+P®, Parker®, Savage Stone®, Stratoflex®, Toledo®, and Weatherhead®.

| Smooth beveled edge hydraulic hose blade | | | | |
|---|---|---|---|---|
| Model | Diameter | Thickness | Arbor | Danfoss saw |
| **ET9500C-07-SM** | 7" | 0.093" | 5/8" | - |
| **ET9100C-07-SM** | 7" | 0.093" | 3/4" | ET9100 |
| **ET9500C-08-SM** | 8" | 0.093" | 5/8" | - |
| **ET9500C-10-SM** | 10" | 0.062" | 5/8" | - |
| **ET9500C-10-1-SM** | 10" | 0.093" | 3/4" | - |
| **ET9200-10-1-SM** | 10" | 0.093" | 40mm | ET9200 |
| **ET9500C-10-2-SM** | 10" | 0.125" | 1" | - |
| **ET9200C-10-SM** | 10" | 0.125" | 40mm | - |
| **ET9500C-12-SM** | 12" | 0.093" | 1" | - |
| **ET9500C-12-1-SM** | 12" | 0.125" | 1" | - |
| **ET9500C-14-SM** | 14" | 0.125" | 1" | - |
| **ET9300C-14-SM** | 14" | 0.160" | 40mm | ET9300 |
| **ET9500C-16-SM** | 16" | 0.160" | 1" | - |
| **ET9500C-18-SM** | 18" | 0.160" | 1" | - |
| **ET9500C-20-SM** | 20" | 0.160" | 1" | - |
| **ET9500C-22-SM** | 22" | 0.160" | 1" | - |
| **ET9500C-24-SM** | 24" | 0.160" | 1" | - |
| **ET9500C-26-SM** | 26" | 0.160" | 1" | - |

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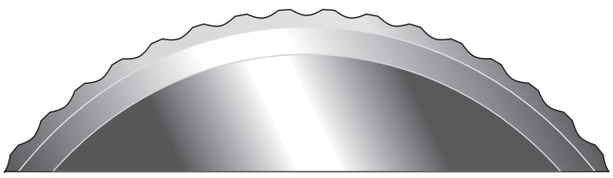
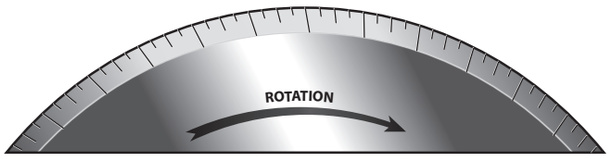
## Hose saw blades



### Notched scalloped hydraulic hose blades

Notched scalloped knives are designed for rough duty cutting on spiral hose up to 6 wire.

Available in sizes 7"-14" to fit Aeroquip®, Clean- Cuts™, Custom Crimp®, Gates®, Goodyear®, Hydroscand®, Imperial Eastman®, O+P®, Parker®, Savage®, Stone®, Stratoflex®, Toledo®, and Weatherhead®.

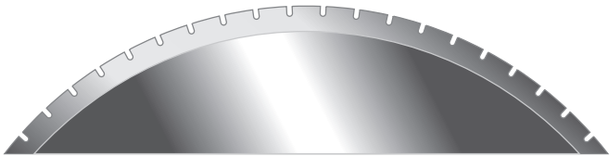



### Micro-slotted smooth hydraulic hose blades

Features "new" micro-slotted smooth edge knife technology combining the better finishes of a double bevel knife with the more aggressive performance of a slotted knife. This is our most universal knife grind and will give you two times longer blade life than smooth edge knives. Used for cutting spiral hose, industrial hose, Teflon, PTFE, Kevlar, and metal hose.

Available in 6" to 14" sizes to fit Aeroquip®, Clean- Cuts™, Custom Crimp®, Gates®, Goodyear®, Imperial Eastman®, Parker®, Stratoflex®, Toledo®, and Weatherhead® saws.

Also available in 16" to 26"sizes to fit Hydroscand®, Finn Power®, Marken®, O+P®, Savage®, Stone®, Techmaflex® and Uniflex® saws.



### Slotted smooth hydraulic hose blades

Designed for cutting 4 to 6 wire spiral hoses, this high performance heavy duty slotted knife reduces pinching by skiving the sides of the hose while cutting.

Available in 7" to 14" sizes to fit Aeroquip®, Clean- Cuts™, Custom Crimp®, Gates®, Goodyear®, Imperial Eastman®, Parker®, Stratoflex®, Toledo®, and Weatherhead® saws.

Available in sizes 16"to 36" to fit on Finn Power®, Hydroscand®, Marken®, O+P®, Savage®, Stone®, Stratoflex®, Techmaflex® and Uniflex® saws.

#### Notched scalloped hydraulic hose blade

| Model | Diameter | Thickness | Arbor | Danfoss saw |
|---|---|---|---|---|
| **ET9500C-07-SC** | 7" | 0.093" | 5/8" | - |
| **ET9100C-07-SC** | 7" | 0.093" | 3/4" | ET9100 |
| **ET9500C-08-SC** | 8" | 0.093" | 5/8" | - |
| **ET9500C-10-SC** | 10" | 0.093" | 3/4" | - |
| **ET9500C-10-1-SC** | 10" | 0.125" | 1" | - |
| **ET9200C-10-SC** | 10" | 0.125" | 40mm | ET9200 |
| **ET9500C-12-SC** | 12" | 0.125" | 1" | - |
| **ET9500C-14-SC** | 14" | 0.125" | 1" | - |

#### Micro-slotted smooth edge hydraulic hose blade

| Model | Diameter | Thickness | Arbor | Danfoss saw |
|---|---|---|---|---|
| **ET9000C-45-MS** | 4.5" | 0.070" | 5/8" | ET9000 |
| **ET9500C-06-MS** | 6" | 0.093" | 5/8" | - |
| **ET9500C-07-MS** | 7" | 0.093" | 5/8" | - |
| **ET9100C-07-MS** | 7" | 0.093" | 3/4" | ET9100 |
| **ET9500C-08-MS** | 8" | 0.093" | 5/8" | - |
| **ET9500C-10-MS** | 10" | 0.062" | 5/8" | - |
| **ET9500C-10-1-MS** | 10" | 0.093" | 3/4" | - |
| **ET9200C-10-1-MS** | 10" | 0.093" | 40mm | ET9200 |
| **ET9500C-10-2-MS** | 10" | 0.125" | 1" | - |
| **ET9200C-10-MS** | 10" | 0.125" | 40mm | ET9200 |
| **ET9500C-12-MS** | 12" | 0.093" | 1" | - |
| **ET9500C-12-1-MS** | 12" | 0.125" | 1" | - |
| **ET9500C-14-MS** | 14" | 0.125" | 1" | - |
| **ET9300C-14-MS** | 14" | 0.160" | 40mm | ET9300 |
| **ET9500C-16-MS** | 16" | 0.160" | 1" | - |
| **ET9500C-18-MS** | 18" | 0.160" | 1" | - |
| **ET9500C-20-MS** | 20" | 0.160" | 1" | - |
| **ET9500C-22-MS** | 22" | 0.160" | 1" | - |
| **ET9500C-24-MS** | 24" | 0.160" | 1" | - |
| **ET9500C-26-MS** | 26" | 0.160" | 1" | - |

#### Slotted smooth hydraulic hose blade

| Model | Diameter | Thickness | Arbor | Danfoss saw |
|---|---|---|---|---|
| **ET9500C-07-SL** | 7" | 0.093" | 5/8" | - |
| **ET9100C-07-SL** | 7" | 0.093" | 3/4" | ET9100 |
| **ET9500C-08-SL** | 8" | 0.093" | 5/8" | - |
| **ET9500C-10-SL** | 10" | 0.062" | 5/8" | - |
| **ET9500C-10-1-SL** | 10" | 0.093" | 3/4" | - |
| **ET9200C-10-1-SL** | 10" | 0.093" | 40mm | ET9200 |
| **ET9500C-10-2-SL** | 10" | 0.125" | 3/4" | - |
| **ET9500C-10-3-SL** | 10" | 0.125" | 1" | - |
| **ET9200C-10-SL** | 10" | 0.125" | 40mm | ET9200 |
| **ET9500C-12-SL** | 12" | 0.093" | 1" | - |
| **ET9500C-12-1-SL** | 14" | 0.125" | 1" | - |
| **ET9500C-14-SL** | 14" | 0.125" | 1" | - |
| **ET9300C-14-SL** | 14" | 0.160" | 40mm | ET9300 |
| **ET9500C-16-SL** | 16" | 0.160" | 1" | - |
| **ET9500C-18-SL** | 18" | 0.160" | 1" | - |
| **ET9500C-20-SL** | 20" | 0.160" | 1" | - |
| **ET9500C-20-1-SL** | 20" | 0.160" | 40mm | - |
| **ET9500C-21-SL** | 21" | 0.160" | 38mm | - |
| **ET9500C-22-SL** | 22" | 0.160" | 50mm | - |
| **ET9500C-24-SL** | 24" | 0.160" | 1" | - |
| **ET9500C-26-SL** | 26" | 0.160" | 1" | - |



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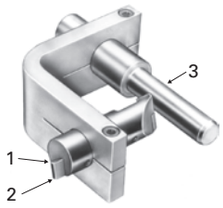
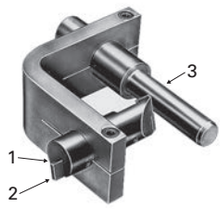
# FT1229-size
**Silver chromate mandrel**



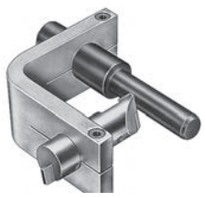

**For reusable fittings**
1 FT1229–2–3 blade holder
2 FT1229–3–4 skive blade
3 FT1229–100–size

# FT1230-size
**Yellow chromate mandrel**




**For crimp fittings**
1 FT1229–2–3 blade holder
2 FT1229–3–4 skive blade
3 FT1230–100–size

# FT1231-size
**Black oxide mandrel**



**For internal skive crimp fittings**

## Mandrels

| | Reusable fittings | | Crimp fittings | | Crimp internal skive fittings | |
|---|---|---|---|---|---|---|
| Hose size | FT1229 | Skive length | FT1230 | Skive length | FT1231 | Skive Length |
| –03 | | | –3 | 0.45 | | |
| –04 | –4 | 0.91 | –4 | 0.76 | | |
| –05 | | | –5 | 0.76 | | |
| –06 | –6 | 1.15<br>1.23<br>1.30 | –6 | 0.90 | | |
| –08 | –8 | 1.25 | –8 | 1.04 | –8 | 1.34 |
| –10 | –10 | 1.25 | –10 | 1.11 | | |
| –12 | –12<br>–12B[3] | 1.40<br>2.40 | –12[1] | 1.21<br>1.31 | –12 | 1.40 |
| –16 | –16<br>–16B[3] | 1.65<br>2.30 | –16<br>–20[1] | 1.30 | –16 | 1.85 |
| –20 | –20<br>–20A[4]<br>–20B[3] | 2.09<br>2.60<br>2.75 | | 1.66<br>1.52<br>1.88 | –20 | 2.05 |
| –24 | –24<br>–24B[5] | 1.95<br>2.60 | –24[1] | 1.74<br>1.64<br>2.18 | –24 | 2.05 |
| –32 | –32[2] | 2.05 | | | –32 | 2.30 |

1 Adjustable tool. 2 FT1229–32 tool is used for reusable and crimp fittings.
3 For FC606. 4 For GH493. 5 For GH493 and FC254.

For skiving rubber covered wire reinforced hoses
When selecting skive tools, refer to Danfoss document AQ430854995685en-000101 for proper skive length of hose sizes.



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# FT1240

## Internal skive tool

FT1240–100–size

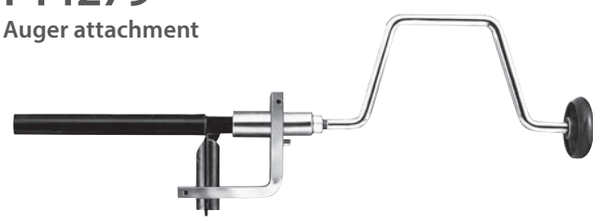
FT1240–150–size

* When tooling begins to wear, contact customer service for information on how to exchange for sharpened tooling.

| Internal skive tool | | | | |
|---|---|---|---|---|
| Internal skive tool | FC254 | FC323 FC324 FC273 | FC325 | FC606 |
| **FT1240–150–8** | –08 | | | |
| **FT1240–100–12** | | –12 | –12 | |
| **FT1240–150–12** | –12 | | | |
| **FT1240–150–16** | –16 | –16 | –16 | –16 |
| **FT1240–100–20** | | –20 | –20 | |
| **FT1240–150–20** | –20 | | | –20 |
| **FT1240–100–24** | | –24 | –24 | |
| **FT1240–150–24** | –24 | | | |
| **FT1240–100–32** | | –32 | –32 | |
| **FT1240–150–32** | –32 | | | |

# FT1279

## Auger attachment



The FT1279 auger attachment permits efficient skiving of rubber covered wire reinforced hose.

Designed for use with FT1229, FT1230 and FT1231 skiving tools, the FT1279 auger attachment promotes quick completion of hand skiving operations.



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# FT1312

## Hose proof test stand

### Hose specifications

Assemblies up to 2" I.D.,
6 spiral wire

### Features

- Designed to use tap water, eliminating the need for a special test fluid
- Compact power unit is air driven
- Air regulator and gauge provide easy pressure adjustment and monitoring
- Tough transparent Lexan* lid
- 79" x 36" x 53", 550 lbs

### Power unit

The power unit of the FT1312 tester is a compact, economical air driven hydraulic pump. It will provide sufficient hydraulic pressure to proof test any Aeroquip hose assembly, up to 22,000 psi

*Lexan is a General Electric trademark.

# FT1261

## Hose proof test stand

### Hose specifications

Assemblies up to 2" I.D.,
6 spiral wire in
50 ft. coil lengths

### Features

- Designed to use tap water, eliminating the need for a special test fluid
- Air regulator and gauge provide easy pressure adjustment and monitoring
- Tough transparent Lexan* lid
- 96" x 84" x 54", 800 lbs

### Power unit

The power unit of the FT1261 tester is a compact, economical air driven hydraulic pump. It will provide sufficient hydraulic pressure to proof test any Aeroquip hose assembly, up to 22,000 psi

*Lexan is a General Electric trademark.

**FT1312 and FT1261 Standard adapter selection chart**

| Hose fitting* style and size | Fitting adapter part # | Pressure port adapter part # | Plug or cap part # |
|---|---|---|---|
| SAE 37°(JIC) swivel | | | |
| –4 | 2027–8–4S | ** | 900599–4 |
| –5 | 2021–6–5S | 2081–12–6S | 900599–5 |
| –6 | 2027–8–6S | ** | 900599–6 |
| –8 | 2027–8–8S | ** | 900599–8 |
| –10 | 2027–10–08S | ** | 900599–10 |
| –12 | 2027–08–12S | ** | 900599–12 |
| –16 | 2021–12–16S | ** | 900599–16 |
| –20 | 2021–16–20S | 2040–12–16S | 900599–20 |
| –24 | 2021–16–24S | 2040–12–16S | 900599–24 |
| –32 | 2021–16–32S | 2040–12–16S | 900599–32 |
| SAE 45° swivel | | | |
| –4 | 2000–06–4B | 2081–12–6S | 900599 –4 |
| –5 | 2000–06–5B | 2081–12–6S | 900599 –5 |
| –6 | 2000–06–6B | 2081–12–6S | 2001–6–6B, 2082–6S |
| –8 | 2000–12–8B | ** | 900599–8 |
| –10 | 2000–12–10B | ** | 900599–10 |
| –12 | 2000–12–12B | ** | 2001–8–12B, 2082–8S |
| Male pipe | | | |
| –2 | 2081–08–02S | 2081–12–08S | 2046–2–2S, 2082–2S |
| –4 | 2081–08–04S | 2081–12–08S | 2046–4–4S, 2082–4S |
| –6 | 2081–08–06S | 2081–12–08S | 2046–6–6S, 2082–6S |
| –8 | 2081–08–08S | ** | 2046–8–8S, 2082–8S |
| –12 | | ** | 2046–12–12S, 2082–12S |
| –16 | 2040–12–16S | ** | 2046–16–16S, 2082–16S |
| –20 | 2040–16–20S | 2040–12–16S | 2046–20–20S, 2082–20S |
| –24 | 2040–20–24S | 2040–12–16S, 2040–16–20S | 2046–24–24S, 2082–24S |
| –32 | 2040–24–32S | 2040–12–16S, 2040–16–20S, 2040–20–24S | 2046–32–32S, 2082–32S |

*Two adapters are required per hose assembly to be tested.
**Internal Skive fittings only.

*Two adapters are required per hose assembly to be tested.



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# FT1058

## Hose proof test stand

### Features

- Pressure gauge
- Release valve
- Hand hydraulic pump
- Foot switch
- Fluid reservoir, use SAE 5 wt. hydraulic oil (oil not included)
- Electric fluid pump
- Safety lid
- Pressure port (3/4–14 NPTF Female Port)
- 42" x 22" x 9" (41" with legs), 75 lbs
- 10,000 psi maximum proof pressure

### Electrical requirements

110V 60 Hz, single phase motor

### Ordering instructions

FT1058 as shown above. Legs can be removed for bench mounting.

**FT1058 Adapter selection chart**

| Hose fitting* style and size | Fitting adapter part # | Pressure port adapter part # | Plug or cap part # |
|---|---|---|---|
| SAE 37°(JIC) swivel | | | |
| –4 | 2021–6–4S | 2081–12–6S | 900599–4 |
| –5 | 2021–6–5S | 2081–12–6S | 900599–5 |
| –6 | 2021–12–6S | - | 900599–6 |
| –8 | 2021–12–8S | - | 900599–8 |
| –10 | 2021–12–10S | - | 900599–10 |
| –12 | 2021–12–12S | - | 900599–12 |
| –16 | 2021–12–16S | - | 900599–16 |
| –20 | 2021–16–20S | 2040–12–16S | 900599–20 |
| –24 | 2021–16–24S | 2040–12–16S | 900599–24 |
| –32 | 2021–16–32S | 2040–12–16S | 900599–32 |
| SAE 45° swivel | | | |
| –4 | 2000–06–04B | 2081–12–6S | 900599–4 |
| –5 | 2000–06–05B | 2081–12–6S | 900599–5 |
| –6 | 2000–06–06B | 2081–12–6S | 2001–6–6B, 2082–6S |
| –8 | 2000–12–08B | - | 900599–8 |
| –10 | 2000–12–10B | - | 900599–10 |
| –12 | 2000–12–12B | - | 2001–8–12B, 2082–8S |
| Male pipe | | | |
| –2 | 2081–8–2S | 2081–12–8S | 2046–1–2S, 2082–2S |
| –4 | 2081–8–4S | 2081–12–8S | 2046–4–4S, 2082–4S |
| –6 | 2081–8–6S | 2081–12–8S | 2046–6–6S, 2082–6S |
| –8 | 2081–12–8S | - | 2046–8–8S, 2082–8S |
| –12 | | - | 2046–12–12S, 2082–12S |
| –16 | 2040–12–16S | - | 2046–16–16S, 2082–16S |
| –20 | 2040–16–20S | 2040–12–16S | 2046–20–20S, 2082–20S |
| –24 | 2040–20–24S | 2040–12–16S, 2040–16–20S | 2046–24–24S, 2082–24S |
| –32 | 2040–24–32S | 2040–12–16S, 2040–16–20S, 2040–20–24S | 2046–32–32S, 2082–32S |

*Adapters are available for other hose fitting styles. Contact Danfoss.



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# FT1455 Series

## Projectile cleaning system

### FT1455 Series projectile cleaning system

FT1455 Series is focused on eliminating contamination in hydraulic systems. Contamination control is crucial during the preparation processes in assembling fittings on hose, tubes, and pipes. These systems shoot the FT1355 Series cleaning projectiles through hose, tubes, and pipe assemblies to successfully remove rubber dust and metal particles arising from the hydraulic hose cutting process, remove metal flashings from the hose assembly process (crimping), and remove contaminated oil from hoses, tubes and pipes prior to installation in hydraulics systems.

### Features

- Provides industry leading ISO cleanliness levels
- Simple and robust construction
- Available in hand-held and bench-mount configurations
- Ideal for portable small volume applications, and large volume production applications
- Broad variety of projectile and nozzle types and sizes to match application needs
- Minimal setup, works off shop air (80–110 psi)
- Capability: 1/8" to 4 1/2" ID hose, tube or pipe
- Available in kits or individual replacement hardware components
- Kits available with and without projectiles

| Typical applications | |
|---|---|
| **Hydraulics** | • Removes rubber dust and metal particles from the hydraulic hose cutting process<br>• Removes metal flash from the crimping process on hose and tubes<br>• Removal of contaminated oil from hoses, tubes and pipes in hydraulic systems |
| **Pneumatics** | • Eliminates rubber contamination, metal particles, contaminated oil and moisture that causes breakdowns and inefficiency |
| **Heat exchangers & condenser** | • Eliminates contamination that reduces heat transfer resulting in low level performance |
| **Steam boilers** | • Removes most scaling in steam pipes for maintenance servicing |
| **Air conditioning & refrigeration** | • Eliminates minute particles in copper tubes and coolant lines that affect system performance |
| **Oxygen & gas** | • Eliminates oil, grease and other contaminants from copper or S/S tubing |
| **Oil, gas & chemical processing** | • Efficient cleaning of pipes as part of service maintenance |
| **Earthmoving equipment** | • Maintenance reduction in flushing time and filter usage |
| **Automotive & servicing** | • Cleaning of fuel lines and brake lines prior to assembly and servicing of components |
| **Food & beverage** | • Product recovery retrieval of product from lines. Reducing or eliminating solvents or detergents |
| **Gun barrels** | • To remove rust, scale or powder residue much faster than brushing or swabbing |



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# FT1455 Series

## Hardware

### FT1455-L1

**Hand held projectile cleaning hardware for small hose diameters (up to 1-1/4 " hose ID)**

- Capability – For use with 1/8" through 1-1/4" ID hose, tube or pipe assemblies
- Construction – Simple construction with durable brass and aluminum parts with rigid plastic handle
- Form factor – Hand-held, portable - ideal for mobile applications
- Typical applications: small volume hose shop environments
- Includes hand-held launcher hardware only. Does not include adapter rings and nozzles for operation. Intended for replacement purposes only

### FT1455-L2

**Hand held projectile cleaning hardware for medium hose diameters** (up to 2" hose ID)

- Capability – For use with 1/8" through 2" ID hose, tube or pipe assemblies
- Construction - Precision machined aluminum with fully anodized components
- Form factor – Hand-held, portable – ideal for harsh environments and heavy use
- Typical applications: Production hose and tube shops, mobile hose fabricators and mobile applications
- Includes hand-held launcher hardware only. Does not include adapter rings and nozzles for operation. Intended for replacement purposes only

### FT1455-L3

**Hand held projectile cleaning hardware for large hose diameters** (up to 3-1/2" hose ID)*

- Capability – For use with 1/8" through 3-1/2" ID hose, tube or pipe assemblies
- Construction - Precision machined aluminum with fully anodized components
- Form factor – Hand-held, portable – ideal for harsh environments and heavy use
- Typical applications: Production hose and tube shops, mobile hose fabricators and mobile applications
- Includes hand-held launcher hardware only. Does not include adapter rings and nozzles for operation. Intended for replacement purposes only

### FT1455-L4

**Bench mount projectile cleaning hardware kit for small hose diameters** (up to 1-1/4" hose ID)*

- Capability – For use with 1/8" through 1-1/4" ID hose, tube or pipe assemblies
- Construction – Stainless steel housing with anodized aluminum components
- Form factor – Bench mount – ideal for production assemblies (1.2 second cycle time)
- Typical applications: Production hose and tube shops
- Includes bench mount launcher hardware, 5 micron air filter, pneumatic foot switch and twin line air hose and 7 nozzles for hose ID ranging from 1/4" through 1-1/4"

**NOTE:** For proper operation the following are required:

- 80 psi (5.5 Bar) minimum to 110 psi (7.5 Bar) maximum air pressure
- 1/2" ID air hose with a minimum of 55 SCFM (1.6 $m^3$/min) air flow rate†
- 5 micron air filter and regulator with gauge are strongly suggested
- A large industrial compressor is strongly recommended
- A compressed air dryer is strongly recommended

†A minimum of 38 SCFM (1.1 $m^3$/min) air flow rate at 80 psi (5.5 bar) is required for FT1455-L3 launcher

*FT1455-L3 can be converted to work on hose ID up to 4" with the addition of FT1455-N-45 4-1/2" aluminum locking nozzle.



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# FT1455 series

**Projectile cleaning system kit**

## FT1455-K3

**Hand held projectile cleaning kit for medium hose diameters** (up to 2" hose ID)

- Capability – For use with 1/4" through 2" ID hose, tube or pipe assemblies
- Construction – Precision machined aluminum with fully anodized components
- Form factor – Hand-held, portable – ideal for harsh environments and heavy use
- Typical applications – Production hose and tube shops, mobile hose fabricators and mobile applications

# FT1455 series

**Cleaning nozzles**

Broad variety of nozzles are available allowing the operator to select the ideal nozzle for each application based on the different size and type of hoses, hose fittings, tube and pipe assemblies. All nozzle sizes are denoted by the projectile exit diameter (mm).

## FT1455-N-HXX

**Nozzles for hose assemblies**

- Universal nozzle for use with hoses
- Also work on pipe, heavy walled tubing and many fitting configurations

| FT1455-N-HXX nozzles | |
|---|---|
| Part # | Description |
| **FT1455-N-HXX** | Nozzles for hose assemblies |
| **FT1455-N-H06** | Hose nozzle (1/4") |
| **FT1455-N-H08** | Hose nozzle (5/16") |
| **FT1455-N-H10** | Hose nozzle (3/8") |
| **FT1455-N-H13** | Hose nozzle (1/2") |
| **FT1455-N-H16** | Hose nozzle (5/8") |
| **FT1455-N-H19** | Hose nozzle (3/4") |
| **FT1455-N-H25** | Hose nozzle (1") |
| **FT1455-N-H32** | Hose nozzle (1-1/4") |
| **FT1455-N-H38** | Hose nozzle (1-1/2") |
| **FT1455-N-H50** | Hose nozzle (2") |
| **FT1455-N-U55** | Universal hose nozzle (1-1/8" thru 3-1/2") |
| **FT1455-N-45** | 4-1/2" aluminum locking nozzle |

## FT1455-J-XX

**Nozzles for hose assemblies with JIC fittings**

- Nozzles molded with 37° male flare on tip to fit female JIC fittings on hose assemblies

| FT1455-J-XX nozzles | |
|---|---|
| FT1455-J-XX | Nozzles for tube assemblies (Metric) Outside diameter X wall thickness |
| **FT1455-J-06** | JIC nozzle (4-1/2") |
| **FT1455-J-10** | JIC nozzle (4-1/2") |
| **FT1455-J-13** | JIC/TUBE nozzle (-8, 1/2") |
| **FT1455-J-16** | JIC/TUBE nozzle (-10, 5/8") |
| **FT1455-J-19** | JIC/TUBE nozzle (-12, 3/4") |
| **FT1455-J-25** | JIC/TUBE nozzle (-16, 1" & 7/8") |
| **FT1455-J-32** | JIC/TUBE nozzle (-20, 1-1/4" & 1") |
| **FT1455-J-38** | JIC/TUBE nozzle (-24, 1-1/2") |
| **FT1455-J-50** | JIC/TUBE nozzle (-32, 2") |



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# FT1455 series (cont.)

## Cleaning nozzles

Broad variety of nozzles are available allowing the operator to select the ideal nozzle for each application based on the different size and type of hoses, hose fittings, tube and pipe assemblies. All nozzle sizes are denoted by the projectile exit diameter (mm).

## FT1455-NT-XX

**Nozzles for tube assemblies (Inch)**

- Nominal inch tube nozzles have a lip on the inside that forms an airtight seal when tube is fully inserted into the nozzle

| FT1455-NT-XX nozzles | |
|---|---|
| FT1455-NT-XX | Nozzles for tube assemblies (Inch) |
| **FT1455-NT-32** | TUBE nozzle 1-1/4" OD |
| **FT1455-NT-06** | TUBE nozzle 1/4" OD |
| **FT1455-NT-03** | TUBE nozzle 1/8" OD |
| **FT1455-NT-10** | TUBE nozzle 3/8" OD |
| **FT1455-NT-08** | TUBE nozzle 5/16" OD |

## FT1455-NT-XXXXX

**Nozzles for tube assemblies (Metric)**

- Metric tube nozzles have a lip on the inside that forms an airtight seal when tube is fully inserted into the nozzle
- Metric tube nozzle designations utilize the largest wall thickness for a given outside diameter, but fit all smaller wall thicknesses as well

| FT1455-NT-XXXXX nozzles | |
|---|---|
| FT1455-NT-XX | Nozzles for tube assemblies (Metric)<br>Outside diameter X wall thickness |
| **FT1455-NT-06x1.5** | Metric tube nozzle UC-6 X 1.5 |
| **FT1455-NT-08x1.5** | Metric tube nozzle UC-8 X 1.5 |
| **FT1455-NT-10x1.5** | Metric tube nozzle UC-10 X 1.5 |
| **FT1455-NT-12x2.0** | Metric tube nozzle UC-12 X 2.0 |
| **FT1455-NT-14x2.0** | Metric tube nozzle UC-14 X 2.0 |
| **FT1455-NT-15x2.0** | Metric tube nozzle UC-15 X 2.0 |
| **FT1455-NT-16x2.5** | Metric tube nozzle UC-16 X 2.5 |
| **FT1455-NT-18x2.5** | Metric tube nozzle UC-18 X 2.5 |
| **FT1455-NT-20x3.0** | Metric tube nozzle UC-20 X 3.0 |
| **FT1455-NT-22x2.0** | Metric tube nozzle UC-22 X 2.0 |
| **FT1455-NT-25x3.0** | Metric tube nozzle UC-25 X 3.0 |
| **FT1455-NT-28x2.5** | Metric tube nozzle UC-28 X 2.5 |
| **FT1455-NT-30x4.0** | Metric tube nozzle UC-30 X 4.0 |
| **FT1455-NT-35x3.0** | Metric tube nozzle UC-35 X 3.0 |
| **FT1455-NT-38x5.0** | Metric tube nozzle UC-38 X 5.0 |
| **FT1455-NT-42x3.0** | Metric tube nozzle UC-42 X 3.0 |
| **FT1455-NT-50x5.0** | Metric tube nozzle UC-50 X 5.0 |
| **FT1455-4FFORX** | Nozzle for use with flat face O-Ring seal fittings (FORS) |



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# FT1455 series
## Adapter & locking rings

### FT1455-L2-AR1
**Adapter ring**

Adapter ring for FT1455-L2 launcher to receive 1/8" thru 1-1/4" nozzles

- FT1455-L2-AR1 adapter ring fits the FT1455-L2 hand held launcher and all nozzle types and sizes between 1/8" and 1-1/4"

### FT1455-L3-LR
**Locking ring**

3-1/2" aluminum locking ring for FT1455-L3 launcher FT1455-L3-LR locking ring fits

- FT1455-L3 hand held launcher, both FT1455-L3-AR2 & FT1455-L3-AR3 adapter rings, and FT1455-N-U55 Universal hose nozzle

### FT1455-L3-AR2
**Adapter ring**

Adapter ring for FT1455-L3 launcher to receive 1/8" thru 1-1/4" nozzles

- FT1455-L3-AR2 adapter ring fits the FT1455-L3 hand held launcher and all nozzle types and sizes between 1/8" and 1-1/4"

### FT1455-L3-AR3
**Adapter ring**

Adapter ring for FT1455-L3 launcher to receive 1-1/2" thru 2" nozzles

- FT1455-L3-AR3 adapter ring fits the FT1455-L3 hand held launcher and all nozzel types and sizes between 1-1/2" and 2".



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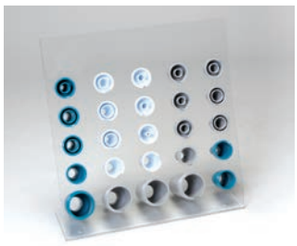
# FT1455 series

## Accessories



### FT1455-NH25

**Desktop nozzle holder**

- The desktop nozzle holder is a great alternative to storing the nozzles in the carrying case
- Can be easily attached to the workbench and offers easy access during change overs and operation
- Accommodates all types of nozzles ranging from 1/4" to 2"

### FT1455-QC

**Quick release coupling**

- Quick release coupling offers a quick disconnect and exchange of air supply to all three models of hand held projectile launchers
- Ideal for portable applications that require frequent disconnects

### FT1455-CC

**Carrying case**

- Convenient carrying case to store and carry the hand held projectile launchers and relevant nozzles
- Works will all 3 models of hand held projectile launchers

# FT1455 Operating Instructions

## Manuals

### FT1455-L1

**Operators Manual**

Doc #: AQ445452721726en-000101

### FT1455-L3

**Operators Manual**

Doc #: AQ445452770728en-000101

### FT1455-L2

**Operators Manual**

Doc #: AQ445452746727en-000101

### FT1455-L4

**Operators Manual**

Doc #: AQ445452791729en-000101



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# FT1455 & FT1355 series

## Recommended nozzles and cleaning projectiles for hoses and hose assemblies

### Recommendations for hoses: nominal hose diameter

| Inches | mm | Nozzle part # | Cleaning projectile part# |
|---|---|---|---|
| 3/16 | 05 | FT1455-N-H06 | FT1355-H-06 - |
| 1/4 | 06 | FT1455-N-H06 | FT1355-H-10 or FT1355-H-12 |
| 5/16 | 08 | FT1455-N-H08 | FT1355-H-12 or FT1355-H-14 |
| 3/8 | 10 | FT1455-N-H10 | FT1355-H-14 or FT1355-H-16 |
| 1/2 | 13 | FT1455-N-H13 | FT1355-H-18 or FT1355-H-20 |
| 5/8 | 16 | FT1455-N-H16 | FT1355-H-22 - |
| 3/4 | 19 | FT1455-N-H19 | FT1355-H-26 - |
| 1 | 25 | FT1455-N-H25 | FT1355-H-33 or FT1355-H-36 |
| 1-1/4 | 32 | FT1455-N-H32 | FT1355-H-40 or FT1355-H-45 |
| 1-1/2 | 38 | FT1455-N-H38 | FT1355-H-50 or FT1355-H-55 |
| 2 | 50 | FT1455-N-H50 | FT1355-H-60 or FT1355-H-65 |
| 2-1/2 | 63 | FT1455-N-U55 | FT1355-H-75 - |
| 3 | 76 | FT1455-N-U55 | FT1355-H-85 - |
| 3-1/2 | 89 | FT1455-N-U55 | FT1355-H-100 - |
| 4 | 102 | FT1455-N-45 | - - |
| 4-1/2 | 114 | FT1455-N-45 | - - |

### Recommendations for hose assemblies with ORS fittings

| ORS fitting dash size | Nozzle part # | Cleaning projectile part # |
|---|---|---|
| -4 | FT1455-4FFORX | FT1355-H-06 or FT1355-H-07 |
| -6 | FT1455-N-H06 | FT1355-H-12 - |
| -8 | FT1455-N-H10 | FT1355-H-16 - |
| -10 | FT1455-N-H13 | FT1355-H-22 - |
| -12 | FT1455-N-H16 | FT1355-H-26 - |
| -16 | FT1455-N-H19 | FT1355-H-33 - |
| -20 | FT1455-N-H25 | FT1355-H-40 - |

### Recommendations for hose assemblies with Code 61 or 62 flanges

| Code 61 or 62 flange dash size | Nozzle part # | Cleaning projectile part # |
|---|---|---|
| -8 | FT1455-N-H10 | FT1355-H-16 |
| -10 | FT1455-N-H13 | FT1355-H-22 |
| -12 | FT1455-N-H16 | FT1355-H-26 |
| -16 | FT1455-N-H19 | FT1355-H-33 |
| -20 | FT1455-N-H25 | FT1355-H-40 |
| -24 | FT1455-N-H32 | FT1355-H-50 |
| -32 | FT1455-N-H32 | FT1355-H-60 |

### Recommendations for hose assemblies with JIC fittings

| JIC fitting dash size | Nozzle part # | Cleaning projectile part # |
|---|---|---|
| -4 | FT1455-J-06 | FT1355-H-06 or FT1355-H-07 |
| -6 | FT1455-J-10 | FT1355-H-12 |
| -8 | FT1455-J-13 | FT1355-H-16 |
| -10 | FT1455-J-16 | FT1355-H-22 |
| -12 | FT1455-J-19 | FT1355-H-26 |
| -16 | FT1455-J-25 | FT1355-H-33 |
| -20 | FT1455-J-32 | FT1355-H40 |
| -24 | FT1455-J-38 | FT1355-H-50 |
| -32 | FT1455-J-50 | FT1355-H-60 |



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# FT1455 & FT1355 series

## Recommended nozzles and cleaning projectiles for pipes and tubes

### Recommended nozzles and cleaning projectiles for pipes (inch)

| SCH 40 | Nozzle part # | Cleaning projectile part # | Abrasive projectile part # |
|---|---|---|---|
| 1/4" | FT1455-N-H08 | FT1355-H-14 | FT1355-A-12 |
| 3/8" | FT1455-N-H13 | FT1355-H-18 | FT1355-A-16 |
| 1/2" | FT1455-N-H16 | FT1355-H-20 | FT1355-A-18 |
| 3/4" | FT1455-N-H19 | FT1355-H-30 | FT1355-A-26 |
| 1 | FT1455-N-H25 | FT1355-H-36 | FT1355-A-33 |
| 1-1/4" | FT1455-N-H32 | FT1355-H-45 | FT1355-A-40 |
| 1-1/2" | FT1455-N-H38 | FT1355-H-55 | FT1355-A-50 |
| 2" | FT1455-N-H50 | FT1355-H-65 | - |
| 2-1/2" | FT1455-N-U55 | FT1355-H-75 | - |
| 3" | FT1455-N-U55 | FT1355-H-85 | - |
| 3-1/2" | FT1455-N-U55 | FT1355-H-100 | - |

| SCH 80 | Nozzle part # | Cleaning projectile part # | Abrasive projectile part # |
|---|---|---|---|
| 1/4" | FT1455-N-H06 | FT1355-H-12 | FT1355-A-10 |
| 3/8" | FT1455-N-H10 | FT1355-H-16 | FT1355-A-14 |
| 1/2" | FT1455-N-H13 | FT1355-H-20 | FT1355-A-16 or FT1355-A-18 |
| 3/4" | FT1455-N-H19 | FT1355-H-26 | FT1355-A-22 |
| 1" | FT1455-N-H25 | FT1355-H-36 | FT1355-A-30 |
| 1- 1/4" | FT1455-N-H32 | FT1355-H-45 | FT1355-A-40 |
| 1-1/2" | FT1455-N-H38 | FT1355-H-50 | FT1355-A-45 |
| 2" | FT1455-N-H38 | FT1355-H-60 | FT1355-A-55 |
| 2-1/2" | FT1455-N-H50 | FT1355-H-70 | - |
| 3" | FT1455-N-U55 | FT1355-H-85 | - |
| 3-1/2" | FT1455-N-U55 | FT1355-H-100 | - |

| SCH 160 | Nozzle part # | Cleaning projectile part # | Abrasive projectile part # |
|---|---|---|---|
| 1/2" | FT1455-N-H10 | FT1355-H-16 | FT1355-A-14 |
| 3/4" | FT1455-N-H16 | FT1355-H-20 | FT1355-A-18 |
| 1" | FT1455-N-H19 | FT1355-H-30 | FT1355-A-26 |
| 1-1/4" | FT1455-N-H25 | FT1355-H-36 | FT1355-A-33 |
| 1-1/2" | FT1455-N-H32 | FT1355-H-45 | FT1355-A-40 |
| 2" | FT1455-N-H38 | FT1355-H-55 | FT1355-A-45 or FT1355-A-50 |
| 2-1/2" | FT1455-N-H50 | FT1355-H-65 | FT1355-A-60 |
| 3" | FT1455-N-U55 | FT1355-H-75 | - |
| 4" | FT1455-N-U55 | FT1355-H-100 | - |

### Recommended nozzles and cleaning projectiles for tubes (inch)

| Outside diameter x wall thickness | Nozzle part # | Cleaning projectile part # | Abrasive projectile part # | Tube projectile part # |
|---|---|---|---|---|
| 1/8" X 0.030" | FT1455-NT-3 | - | - | - |
| 1/4" X 0.035" | FT1455-NT-6 | FT1355-H-10 | FT1355-A-07 | FT1355-T-06 |
| 1/4" X 0.049" | FT1455-NT-6 | FT1355-H-08 | FT1355-A-07 | FT1355-T-06 |
| 1/4" X 0.065" | FT1455-NT-6 | FT1355-H-07 | - | FT1355-T-06 |
| 5/16" X 0.035" | FT1455-NT-8 | FT1355-H-12 | FT1355-A-10 | FT1355-T-07 |
| 3/8" X 0.035"-0.049" | FT1455-NT-10 | FT1355-H-14 | FT1355-A-12 | FT1355-T-10 |
| 3/8" X 0.065" | FT1455-NT-10 | FT1355-H-12 | FT1355-A-10 | FT1355-T-10 |
| 1/2" X 0.035" | FT1455-J-13 | FT1355-H-16 | FT1355-A-16 | FT1355-T-14 |
| 1/2" X 0.049" | FT1455-J-13 | FT1355-H-16 | FT1355-A-16 | FT1355-T-12 |
| 1/2" X 0.065" | FT1455-J-13 | FT1355-H-16 | FT1355-A-14 | FT1355-T-12 |
| 1/2" X 0.083" | FT1455-J-13 | FT1355-H-14 | FT1355-A-12 | FT1355-T-12 |
| 5/8" X 0.049" | FT1455-J-16 | FT1355-H-22 | FT1355-A-20 | FT1355-T-16 |
| 5/8" X 0.065" | FT1455-J-16 | FT1355-H-20 | FT1355-A-18 | FT1355-T-16 |
| 5/8" X 0.083" | FT1455-J-16 | FT1355-H-20 | FT1355-A-18 | FT1355-T-14 |
| 3/4" X 0.049"-0.065" | FT1455-J-19 | FT1355-H-26 | FT1355-A-24 | FT1355-T-20 |
| 3/4" X 0.095" | FT1455-J-19 | FT1355-H-22 | FT1355-A-20 | FT1355-T-18 |
| 7/8" X 0.049" | FT1455-J-25 | FT1355-H-33 | FT1355-A-30 | FT1355-T-26 |
| 7/8" X 0.065" | FT1455-J-25 | FT1355-H-30 | FT1355-A-28 | FT1355-T-22 |
| 7/8" X 0.095" | FT1455-N-H16 | FT1355-H-28 | FT1355-A-26 | FT1355-T-22 |
| 1" X 0.065" | FT1455-J-32 | FT1355-H-33 | FT1355-A-30 | FT1355-T-28 |
| 1" X 0.083"-0.095" | FT1455-J-32 | FT1355-H-33 | FT1355-A-30 | FT1355-T-26 |
| 1" X 0.120" | FT1455-J-32 | FT1355-H-30 | FT1355-A-28 | FT1355-T-26 |
| 1 1/4" X 0.065" | FT1455-NT-32 | FT1355-H-40 | FT1355-A-40 | FT1355-T-33 |
| 1 1/4" X 0.083" | FT1455-NT-32 | FT1355-H-40 | FT1355-A-36 | FT1355-T-33 |
| 1 1/4" X 0.095" | FT1455-NT-32 | FT1355-H-40 | FT1355-A-36 | FT1355-T-33 |
| 1 1/4" X 0.109" | FT1455-NT-32 | FT1355-H-36 | FT1355-A-36 | FT1355-T-33 |
| 1 1/4" X 0.120" | FT1455-NT-32 | FT1355-H-36 | FT1355-A-33 | FT1355-T-33 |
| 1 1/2" X 0.065"-.120" | FT1455-J-38 | FT1355-H-50 | FT1355-A-45 | FT1355-T-40 |
| 1 1/2" X 0.134"-0.148" | FT1455-J-38 | FT1355-H-45 | FT1355-A-40 | FT1355-T-40 |
| 2" X 0.065"-0.120" | FT1455-J-50 | FT1355-H-60 | FT1355-A-55 | FT1355-T-50 |
| 2" X 0.134"-0.188" | FT1455-J-50 | FT1355-H-55 | FT1355-A-50 | FT1355-T-50 |



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# FT1455 & FT1355 series

## Recommended nozzles and cleaning projectiles for tubes (metric)

| Nozzles & cleaning projectles for tubes | | | | |
|---|---|---|---|---|
| Outside diameter x wall thickness | Nozzle part # | Cleaning projectile part # | Abrasive projectile part # | Tube projectile part # |
| 6 X 1.0 | FT1455-NT-06x1.5 | FT1355-H-07 | FT1355-A-06 | FT1355-T-06 |
| 6 X 1.5 | FT1455-NT-06x1.5 | FT1355-H-07 | FT1355-A-06 | - |
| 8 X 1.0 | FT1455-NT-08x1.5 | FT1355-H-10 | FT1355-A-07 | FT1355-T-07 |
| 8 X 1.5 | FT1455-NT-08x1.5 | FT1355-H-10 | FT1355-A-07 | FT1355-T-07 |
| 10 X 1.0 | FT1455-NT-10x1.5 | FT1355-H-14 | FT1355-A-12 | FT1355-T-12 |
| 10 X 1.5 | FT1455-NT-10x1.5 | FT1355-H-14 | FT1355-A-12 | FT1355-T-12 |
| 12 X 1.0 | FT1455-NT-12x2.0 | FT1355-H-16 | FT1355-A-14 | FT1355-T-14 |
| 12 X 1.5 | FT1455-NT-12x2.0 | FT1355-H-16 | FT1355-A-14 | FT1355-T-14 |
| 12 X 2.0 | FT1455-NT-12x2.0 | FT1355-H-14 | FT1355-A-12 | FT1355-T-12 |
| 14 X 1.0 | FT1455-NT-14x2.0 | FT1355-H-18 | FT1355-A-16 | FT1355-T-16 |
| 14 X 1.5 | FT1455-NT-14x2.0 | FT1355-H-16 | FT1355-A-14 | FT1355-T-14 |
| 14 X 2.0 | FT1455-NT-14x2.0 | FT1355-H-16 | FT1355-A-14 | FT1355-T-14 |
| 15 X 1.0 | FT1455-NT-15x2.0 | FT1355-H-20 | FT1355-A-18 | FT1355-T-16 |
| 15 X 1.5 | FT1455-NT-15x2.0 | FT1355-H-18 | FT1355-A-16 | FT1355-T-16 |
| 15 X 2.0 | FT1455-NT-15x2.0 | FT1355-H-16 | FT1355-A-14 | FT1355-T-14 |
| 16 X 1.0 | FT1455-NT-16x2.5 | FT1355-H-22 | FT1355-A-20 | FT1355-T-18 |
| 16 X 1.5 | FT1455-NT-16x2.5 | FT1355-H-20 | FT1355-A-18 | FT1355-T-16 |
| 16 X 2.0 | FT1455-NT-16x2.5 | FT1355-H-18 | FT1355-A-16 | FT1355-T-16 |
| 16 X 2.5 | FT1455-NT-16x2.5 | FT1355-H-16 | FT1355-A-14 | FT1355-T-14 |
| 18 X 1.0 | FT1455-NT-18x2.5 | FT1355-H-24 | FT1355-A-22 | FT1355-T-20 |
| 18 X 1.5 | FT1455-NT-18x2.5 | FT1355-H-24 | FT1355-A-20 | FT1355-T-18 |
| 18 X 2.0 | FT1455-NT-18x2.5 | FT1355-H-22 | FT1355-A-20 | FT1355-T-18 |
| 18 X 2.5 | FT1455-NT-18x2.5 | FT1355-H-20 | FT1355-A-18 | FT1355-T-16 |
| 20 X 1.5 | FT1455-NT-20x3.0 | FT1355-H-26 | FT1355-A-24 | FT1355-T-22 |
| 20 X 2.0 | FT1455-NT-20x3.0 | FT1355-H-24 | FT1355-A-22 | FT1355-T-20 |
| 20 X2.5 | FT1455-NT-20x3.0 | FT1355-H-24 | FT1355-A-20 | FT1355-T-18 |
| 20 X 3 | FT1455-NT-20x3.0 | FT1355-H-22 | FT1355-A-20 | FT1355-T-18 |

| Nozzles & cleaning projectles for tubes | | | | |
|---|---|---|---|---|
| Outside diameter x wall thickness | Nozzle part # | Cleaning projectile part # | Abrasive projectile part # | Tube projectile part # |
| 22 X 1 | FT1455-NT-22x2.0 | FT1355-H-30 | FT1355-A-28 | FT1355-T-26 |
| 22 X 1.5 | FT1455-NT-22x2.0 | FT1355-H-30 | FT1355-A-28 | FT1355-T-26 |
| 22 X 2 | FT1455-NT-22x2.0 | FT1355-H-30 | FT1355-A-28 | FT1355-T-26 |
| 25 X 2 | FT1455-NT-25x3.0 | FT1355-H-33 | FT1355-A-30 | FT1355-T-28 |
| 25 X 2.5 | FT1455-NT-25x3.0 | FT1355-H-30 | FT1355-A-28 | FT1355-T-26 |
| 25 X 3 | FT1455-NT-25x3.0 | FT1355-H-30 | FT1355-A-28 | FT1355-T-26 |
| 28 X 2 | FT1455-NT-28x2.5 | FT1355-H-36 | FT1355-A-33 | FT1355-T-33 |
| 28 X 2.5 | FT1455-NT-28x2.5 | FT1355-H-36 | FT1355-A-33 | FT1355-T-30 |
| 30 X 2 | FT1455-NT-30x4.0 | FT1355-H-36 | FT1355-A-33 | FT1355-T-33 |
| 30 X 2.5 | FT1455-NT-30x4.0 | FT1355-H-36 | FT1355-A-33 | FT1355-T-30 |
| 30 X 3 | FT1455-NT-30x4.0 | FT1355-H-36 | FT1355-A-33 | FT1355-T-30 |
| 30 X 4 | FT1455-NT-30x4.0 | FT1355-H-36 | FT1355-A-33 | FT1355-T-30 |
| 35 X 2 | FT1455-NT-35x3.0 | FT1355-H-45 | FT1355-A-40 | FT1355-T-40 |
| 35 X 3 | FT1455-NT-35x3.0 | FT1355-H-40 | FT1355-A-36 | FT1355-T-36 |
| 35 X 4 | FT1455-N-H25 | FT1355-H-40 | FT1355-A-36 | FT1355-T-33 |
| 35 X 5 | FT1455-N-H25 | FT1355-H-36 | FT1355-A-33 | FT1355-T-30 |
| 38 X 2.5 | FT1455-NT-38x5.0 | FT1355-H-50 | FT1355-A-45 | FT1355-T-40 |
| 38 X 3 | FT1455-NT-38x5.0 | FT1355-H-50 | FT1355-A-45 | FT1355-T-40 |
| 38 X 4 | FT1455-NT-38x5.0 | FT1355-H-45 | FT1355-A-40 | FT1355-T-40 |
| 38 X 5 | FT1455-NT-38x5.0 | FT1355-H-40 | FT1355-A-36 | FT1355-T-36 |
| 42 X 2 | FT1455-NT-42x3.0 | FT1355-H-55 | FT1355-A-50 | FT1355-T-50 |
| 42 X 3 | FT1455-NT-42x3.0 | FT1355-H-50 | FT1355-A-50 | FT1355-T-45 |
| 50 X 3 | FT1455-NT-50x5.0 | FT1355-H-60 | FT1355-A-55 | FT1355-T-55 |
| 50 X 5 | FT1455-NT-50x5.0 | FT1355-H-55 | FT1355-A-55 | FT1355-T-50 |
| 50 X 6 | FT1455-NT-50x5.0 | FT1355-H-55 | FT1355-A-50 | FT1355-T-50 |



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# FT1355 series

**Cleaning projectiles for hose, tube and pipe assemblies**

FT1355 cleaning projectiles work by being compressed against the internal surface of the hose, tube or pipe. Cleaning projectile selection should favor a diameter 20% to 30% larger than the internal diameter of the hose, tube of pipe being cleaned.

Projectiles are available in 3 variations as outlined below, and are manufactured from virgin materials with a specific cell structure and density to match the application's needs. Appropriate selection of the cleaning projectile based on the type of application ensures effective cleaning.

## FT1355-H-XX

**Hose cleaning projectiles for hose assemblies**

- Universal cleaning projectile for use with hose, tube and pipe assemblies
- Removes fine particles of loose contaminants after cutting operations
- Can also be used for product purging prior to assembly

FT1355-H-XX cleaning projectiles for hose assemblies

| Part # | Description |
|---|---|
| **FT1355-H-05** | Hose cleaning projectile (5mm) |
| **FT1355-H-06** | Hose cleaning projectile (6mm) |
| **FT1355-H-07** | Hose cleaning projectile (7mm) |
| **FT1355-H-08** | Hose cleaning projectile (8mm) |
| **FT1355-H-10** | Hose cleaning projectile (10mm) |
| **FT1355-H-12** | Hose cleaning projectile (12mm) |
| **FT1355-H-14** | Hose cleaning projectile (14mm) |
| **FT1355-H-16** | Hose cleaning projectile (16mm) |
| **FT1355-H-18** | Hose cleaning projectile (18mm) |
| **FT1355-H-20** | Hose cleaning projectile (20mm) |
| **FT1355-H-22** | Hose cleaning projectile (22mm) |
| **FT1355-H-24** | Hose cleaning projectile (24mm) |
| **FT1355-H-26** | Hose cleaning projectile (26mm) |
| **FT1355-H-28** | Hose cleaning projectile (28mm) |
| **FT1355-H-30** | Hose cleaning projectile (30mm) |
| **FT1355-H-33** | Hose cleaning projectile (33mm) |
| **FT1355-H-36** | Hose cleaning projectile (36mm) |
| **FT1355-H-40** | Hose cleaning projectile (40mm) |
| **FT1355-H-45** | Hose cleaning projectile (45mm) |
| **FT1355-H-50** | Hose cleaning projectile (50mm) |
| **FT1355-H-55** | Hose cleaning projectile (55mm) |
| **FT1355-H-60** | Hose cleaning projectile (60mm) |
| **FT1355-H-65** | Hose cleaning projectile (65mm) |
| **FT1355-H-70** | Hose cleaning projectile (70mm) |
| **FT1355-H-75** | Hose cleaning projectile (75mm) |
| **FT1355-H-80** | Hose cleaning projectile (80mm) |
| **FT1355-H-85** | Hose cleaning projectile (85mm) |
| **FT1355-H-90** | Hose cleaning projectile (90mm) |
| **FT1355-H-95** | Hose cleaning projectile (95mm) |
| **FT1355-H-100** | Hose cleaning projectile (100mm) |



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# FT1355 series

**Cleaning projectiles for tube and pipe assemblies**

## FT1355-A-XX

**Abrasive cleaning projectiles for tube and pipe assemblies**

- For use with tubes or pipe assemblies
- Removes mild to medium amounts of contaminants including surface rust and scale build-up
- Can be used multiple times

## FT1355-T-XX

**Tube cleaning projectiles for tube and pipe assemblies**

- Cleaning projectiles for use with tube and pipe assemblies
- Removes mild to medium amounts of contaminants including surface rust and scale build-up
- Removes mandrel lubricants, grease and other oils typically used in bending processes
- Strongly recommended for cleaning stainless steel tubes

FT13555-A-XX abrasive cleaning projectiles for tube and pipe assemblies

| Part # | Description |
|---|---|
| **FT1355-A-06** | Abrasive cleaning projectile (6mm) |
| **FT1355-A-07** | Abrasive cleaning projectile (7mm) |
| **FT1355-A-10** | Abrasive cleaning projectile (10mm) |
| **FT1355-A-12** | Abrasive cleaning projectile (12mm) |
| **FT1355-A-14** | Abrasive cleaning projectile (14mm) |
| **FT1355-A-16** | Abrasive cleaning projectile (16mm) |
| **FT1355-A-18** | Abrasive cleaning projectile (18mm) |
| **FT1355-A-20** | Abrasive cleaning projectile (20mm) |
| **FT1355-A-22** | Abrasive cleaning projectile (22mm) |
| **FT1355-A-24** | Abrasive cleaning projectile (24mm) |
| **FT1355-A-26** | Abrasive cleaning projectile (26mm) |
| **FT1355-A-28** | Abrasive cleaning projectile (28mm) |
| **FT1355-A-30** | Abrasive cleaning projectile (30mm) |
| **FT1355-A-33** | Abrasive cleaning projectile (33mm) |
| **FT1355-A-36** | Abrasive cleaning projectile (36mm) |
| **FT1355-A-40** | Abrasive cleaning projectile (40mm) |
| **FT1355-A-45** | Abrasive cleaning projectile (45mm) |
| **FT1355-A-50** | Abrasive cleaning projectile (50mm) |
| **FT1355-A-55** | Abrasive cleaning projectile (55mm) |
| **FT1355-A-60** | Abrasive cleaning projectile (60mm) |

FT1355-T-XX tube cleaning projectiles for tube assemblies

| Part # | Description |
|---|---|
| **FT1355-T-06** | Tube cleaning projectile (6mm) |
| **FT1355-T-07** | Tube cleaning projectile (7mm) |
| **FT1355-T-10** | Tube cleaning projectile (10mm) |
| **FT1355-T-12** | Tube cleaning projectile (12mm) |
| **FT1355-T-14** | Tube cleaning projectile (14mm) |
| **FT1355-T-16** | Tube cleaning projectile (16mm) |
| **FT1355-T-18** | Tube cleaning projectile (18mm) |
| **FT1355-T-20** | Tube cleaning projectile (20mm) |
| **FT1355-T-22** | Tube cleaning projectile (22mm) |
| **FT1355-T-24** | Tube cleaning projectile (24mm) |
| **FT1355-T-26** | Tube cleaning projectile (26mm) |
| **FT1355-T-28** | Tube cleaning projectile (28mm) |
| **FT1355-T-30** | Tube cleaning projectile (30mm) |
| **FT1355-T-33** | Tube cleaning projectile (33mm) |
| **FT1355-T-36** | Tube cleaning projectile (36mm) |
| **FT1355-T-40** | Tube cleaning projectile (40mm) |
| **FT1355-T-45** | Tube cleaning projectile (45mm) |
| **FT1355-T-50** | Tube cleaning projectile (50mm) |
| **FT1355-T-55** | Tube cleaning projectile (55mm) |
| **FT1355-T-60** | Tube cleaning projectile (60mm) |



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# FT1355 series

## Cleaning projectile selection ordering guidelines

Order quantity is one bag
(ex.. A 1 piece order will be for the full bag quantity noted below)

| FT1355 projectile ordering guide | | |
|---|---|---|
| Danfoss projectile part # | Description | Qty / bag |
| **FT1355-A-06** | ABRASIVE (06mm) (Pkg 100) | 100 |
| **FT1355-A-07** | ABRASIVE (07mm) (Pkg 100) | 100 |
| **FT1355-A-10** | ABRASIVE (10mm) (Pkg 100) | 100 |
| **FT1355-A-12** | ABRASIVE (12mm) (Pkg 100) | 100 |
| **FT1355-A-14** | ABRASIVE (14mm) (Pkg 100) | 100 |
| **FT1355-A-16** | ABRASIVE (16mm) (Pkg 100) | 100 |
| **FT1355-A-18** | ABRASIVE (18mm) (Pkg 100) | 100 |
| **FT1355-A-20** | ABRASIVE (20mm) (Pkg 50) | 50 |
| **FT1355-A-22** | ABRASIVE (22mm) (Pkg 50) | 50 |
| **FT1355-A-24** | ABRASIVE (24mm) (Pkg 50) | 50 |
| **FT1355-A-26** | ABRASIVE (26mm) (Pkg 50) | 50 |
| **FT1355-A-28** | ABRASIVE (28mm) (Pkg 40) | 40 |
| **FT1355-A-30** | ABRASIVE (30mm) (Pkg 40) | 40 |
| **FT1355-A-33** | ABRASIVE (33mm) (Pkg 40) | 40 |
| **FT1355-A-36** | ABRASIVE (36mm) (Pkg 30) | 30 |
| **FT1355-A-40** | ABRASIVE (40mm) (Pkg 30) | 30 |
| **FT1355-A-45** | ABRASIVE (45mm) (Pkg 20) | 20 |
| **FT1355-A-50** | ABRASIVE (50mm) (Pkg 20) | 20 |
| **FT1355-A-55** | ABRASIVE (55mm) (Pkg 15) | 15 |
| **FT1355-A-60** | ABRASIVE (60mm) (Pkg 15) | 15 |
| **FT1355-H-05** | Low density hose projectile (5mm) | 100 |
| **FT1355-H-06** | Low density hose projectile (6mm) | 100 |
| **FT1355-H-07** | Low density hose projectile (7mm) | 100 |
| **FT1355-H-08** | Low density hose projectile (8mm) | 100 |
| **FT1355-H-10** | Low density hose projectile (10mm) | 100 |
| **FT1355-H-12** | Low density hose projectile (12mm) | 100 |
| **FT1355-H-14** | Low density hose projectile (14mm) | 100 |
| **FT1355-H-16** | Low density hose projectile (16mm) | 100 |
| **FT1355-H-18** | Low density hose projectile (18mm) | 100 |
| **FT1355-H-20** | Low density hose projectile (20mm) | 50 |
| **FT1355-H-22** | Low density hose projectile (22mm) | 50 |
| **FT1355-H-24** | Low density hose projectile (24mm) | 50 |
| **FT1355-H-26** | Low density hose projectile (26mm) | 50 |
| **FT1355-H-28** | Low density hose projectile (28mm) | 40 |
| **FT1355-H-30** | Low density hose projectile (30mm) | 40 |

| FT1355 projectile ordering guide | | |
|---|---|---|
| Danfoss projectile part # | Description | Qty / bag |
| **FT1355-H-33** | Low density hose projectile (33mm) | 40 |
| **FT1355-H-36** | Low density hose projectile (36mm) | 30 |
| **FT1355-H-40** | Low density hose projectile (40mm) | 30 |
| **FT1355-H-45** | Low density hose projectile (45mm) | 20 |
| **FT1355-H-50** | Low density hose projectile (50mm) | 20 |
| **FT1355-H-55** | Low density hose projectile (55mm) | 15 |
| **FT1355-H-60** | Low density hose projectile (55mm) | 15 |
| **FT1355-H-65** | Low density hose projectile (60mm) | 10 |
| **FT1355-H-70** | Low density hose projectile (65mm) | 10 |
| **FT1355-H-75** | Low density hose projectile (70mm) | 10 |
| **FT1355-H-80** | Low density hose projectile (80mm) | 10 |
| **FT1355-H-85** | Low density hose projectile (85mm) | 10 |
| **FT1355-H-90** | Low density hose projectile (90mm) | 10 |
| **FT1355-H-95** | Low density hose projectile (95mm) | 10 |
| **FT1355-H-100** | Low density hose projectile (100mm) | 10 |
| **FT1355-T-06** | Tube projectile (06mm) | 100 |
| **FT1355-T-07** | Tube projectile (07mm) | 100 |
| **FT1355-T-10** | Tube projectile (10mm) | 100 |
| **FT1355-T-12** | Tube projectile (12mm) | 100 |
| **FT1355-T-14** | Tube projectile (14mm) | 100 |
| **FT1355-T-16** | Tube projectile (16mm) | 100 |
| **FT1355-T-18** | Tube projectile (18mm) | 100 |
| **FT1355-T-20** | Tube projectile (20mm) | 50 |
| **FT1355-T-22** | Tube projectile (22mm) | 50 |
| **FT1355-T-24** | Tube projectile (24mm) | 50 |
| **FT1355-T-26** | Tube projectile (26mm) | 50 |
| **FT1355-T-28** | Tube projectile (28mm) | 40 |
| **FT1355-T-30** | Tube projectile (30mm) | 40 |
| **FT1355-T-33** | Tube projectile (33mm) | 40 |
| **FT1355-T-36** | Tube projectile (36mm) | 30 |
| **FT1355-T-40** | Tube projectile (40mm) | 30 |
| **FT1355-T-45** | Tube projectile (45mm) | 20 |
| **FT1355-T-50** | Tube projectile (50mm) | 20 |
| **FT1355-T-55** | Tube projectile (55mm) | 15 |
| **FT1355-T-60** | Tube projectile (60mm) | 15 |



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# FT1355 series

## Cleaning projectile selection ordering guidelines

Order quantity is one bag
(ex. A 1 piece order will be for the full bag quantity noted below)

| FT1355 cleaning projectile ordering | | |
|---|---|---|
| FT1355 foam projectile part #'s for FT1455 projectile launchers | Order quantity is one bag (ex. A 1 piece order will be for the full bag quantity noted below) | Inner Diameter (ID) in inches of cut hose, and Hose assembly Dash size |
| **FT1355-H-06** | 100 | 3/16" (-03) |
| **FT1355-H-10 (or)** | 100 | 1/4" (-04) |
| **FT1355-H-12*** | 100 | |
| **FT1355-H-12 (or)** | 100 | |
| **FT1355-H-14*** | 100 | 5/16" (-05) |
| **FT1355-H-14 (or)** | 100 | |
| **FT1355-H-16*** | 100 | 3/8" (-06) |
| **FT1355-H-18 (or)** | 100 | |
| **FT1355-H-20*** | 50 | 1/2" (-08) |
| **FT1355-H-22** | 50 | 5/8" (-10) |
| **FT1355-H-26** | 50 | 3/4" (-12) |

| FT1355 cleaning projectile ordering | | |
|---|---|---|
| FT1355 foam projectile part #'s for FT1455 projectile launchers | Order quantity is one bag (ex. A 1 piece order will be for the full bag quantity noted below) | Inner Diameter (ID) in inches of cut hose, and Hose assembly Dash size |
| **FT1355-H-33 (or)** | 40 | 1" (-16) |
| **FT1355-H-36*** | 30 | |
| **FT1355-H-40** | 30 | 1-1/4" (-20) |
| **FT1355-H-45*** | 20 | |
| **FT1355-H-50 (or)** | 20 | 1-1/2" (-24) |
| **FT1355-H-55*** | 15 | |
| **FT1355-H-60 (or)** | 15 | 2" (-32) |
| **FT1355-H-65*** | 10 | |
| **FT1355-H-75** | 10 | 2-1/2" (-40) |
| **FT1355-H-85** | 10 | 3" (-48) |
| **FT1355-H-100** | 10 | 3-1/2" (-64) |

**NOTE:** *Use the larger projectile size for maximum cleaning on hose cut with an abrasive wheel



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# FT1555 CapSeal system

## FT1555 Series CapSeal system

The FT1555 CapSeal system is intended to be used in conjunction with the FT1355 and FT1455 series projectile cleaning systems to prevent recontamination of hose, tube, and pipe assemblies. The FT1555 CapSeal system utilizes heat shrink technology to encapsulate the end of a hose or tube assembly with an FT1555 CapSeal capsule.

## Features

- Provides industry leading ISO cleanliness levels
- Robust construction for use in heavy duty applications
- Available in hand-held and bench-mount configurations
- Ideal for portable small volume applications, and large volume production applications
- Optimum CapSeal capsule design to meet a broad variety of applications
- Minimal setup
- Capability: 3/8" (10mm) to 3" (78mm OD) hose and fitting ends
- Available in kits or individual replacement hardware components
- Kits available with and without Capseal capsule

Capsule shrink time for CapSeal Systems at multiple intervals

| Machine warm-up time from cold start (minutes) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Machine | Seal time (seconds) | | | | | | | | | |
| FT1555-BM230 | 3.5 | 2.5 | 2 | 1.5 | 1.25 | 1 | 1 | 0.75 | 0.75 | 0.75 |
| FT1555-BM120 | 17 | 10 | 4.5 | 3.25 | 2.5 | 2.25 | 2 | 1.75 | 1.5 | 1.5 |
| FT1555-HH | 10 | 12 | 6 | 4 | 3 | 3 | 2.5 | 2 | 1.75 | 1.75 |



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# FT1555 CapSeal system

**Hardware**

## FT1555-HH

**Hand held electric heat gun**

- Variable temperature electronic heat gun with electronic thermocouple control.
- Duratherm heating element ensure long life and even heat temperature range of 120°F (49°C) to 1100°F (593°C) and a built-in cool down switch.
- Capable of sealing multiple hoses simultaneously.
- Operates on 120V AC power, draws 1500 watts, and can produce 17.6CFM.
- Cool down switch renders gun immediately cool-to-the-touch.

## FT1555-BM120

**120v Ak hand held heat gun with air knife**

- A cradle holds and locks the 120V heat gun into place for bench top shrinking of capsules.
- The heat gun can be easily removed from the cradle for remote capsule shrinking.
- Magnetic puck holds the capsule onto the fitting for a perfect seal during the shrinking process.
- Magnetic puck pulls the swivel nut forward on 90° and 45° fittings for easy insertion into the air knife for capsule shrinking.
- Air knife has heat guard and large 110mm center opening that can be accessed from either side.
- Can seal single or multiple hose or tube assemblies.
- CapSeal capsules will seal hose or tube fitting from 3/8" OD (10mm) through 3" OD (78mm).

## FT1555-BM230

**CapSeal system with air knife**

- Enables sealing of single or multiple hose or tube assemblies at one time.
- Magnetic puck holds capsule onto carbon steel fitting for a perfect seal during sealing process.
- Magnetic puck holds the nut forward on 90° and 45° fittings for easy insertion into the air knife.
- Air knife has heat guard and large 110mm center opening accessible from either side.
- Capsules fit and seal hose and tube fittings from 3/8" OD (10mm) through 3" OD (78mm).
- 230v single-phase AC power at 50/60Hz draws < 5 amps.
- ON/OFF rocker switch illuminates green when "on."
- Built in external air filter minimizes heat gun clogging and maintenance, increasing heat gun longevity.
- Heat side of machine is fully insulated.
- Dedicated air filter prevents airborne contamination during sealing.
- Please note that a L6 -15 NEMA twist loc receptacle (not supplied) is required for operation.
- Durable, long-lasting brushless motor for high-volume production environments.



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# FT1555 CapSeal system

## Kits

### FT1555-HH-K1

**Hand held electric heat gun basic kit**

- Typical applications – Hose shops and mobile hose fabricators
- Capsules fit and seal hose and tube fittings from 3/8" OD (10mm) through 3" OD (78mm)

**FT1555-HH-K1 kit includes**

- FT1555-HH heat gun and air knife with 1 ½ " connection
- FT1555-SMP small magnetic puck
- FT1555-LMP large magnetic puck

### FT1555-HH-K2

**Hand held electric heat gun starter kit**

- Typical applications – Hose shops and mobile hose fabricators
- Capsules fit and seal hose and tube fittings from .55" OD (14mm) through 1.73" OD (44mm)

**FT1555-HH-K1 kit includes in addition to contents of FT1555-HH-K1 kit**

- FT1555-1824UP CapSeal Capsules 18mm x 24mm (ID x LNGTH)
- FT1555-2030UP CapSeal Capsules 20mm x 30mm (ID x LNGTH)
- FT1555-2540UP CapSeal Capsules 25mm x 40mm (ID x LNGTH)
- FT1555-2840UP CapSeal Capsules 28mm x 40mm (ID x LNGTH)
- FT1555-3140UP CapSeal Capsules 31mm x 40mm (ID x LNGTH)
- FT1555-3440UP CapSeal Capsules 34mm x 40mm (ID x LNGTH)
- FT1555-3840UP CapSeal Capsules 38mm x 40mm (ID x LNGTH)
- FT1555-4650UP CapSeal Capsules 46mm x 50mm (ID x LNGTH)

### FT1555-HH-K3

**Hand held electric heat gun premium starter kit**

- Typical applications – Hose shops and mobile hose fabricators
- Capsules fit and seal hose and tube fittings from .55" OD (14mm) through 3.07" OD (78mm)

**FT1555-HH-K3 kit includes in addition to contents of FT1555-HH-K1 kit**

- FT1555-1824UP CapSeal Capsules 1 8mm x 24mm (ID x LNGTH)
- FT1555-2030UP CapSeal Capsules 20mm x 30mm (ID x LNGTH)
- FT1555-2540UP CapSeal Capsules 25mm x 40mm (ID x LNGTH)
- FT1555-2840UP CapSeal Capsules 28mm x 40mm (ID x LNGTH)
- FT1555-3140UP CapSeal Capsules 31mm x 40mm (ID x LNGTH)
- FT1555-3440UP CapSeal Capsules 34mm x 40mm (ID x LNGTH)
- FT1555-3840UP CapSeal Capsules 38mm x 40mm (ID x LNGTH)
- FT1555-4650UP CapSeal Capsules 46mm x 50mm (ID x LNGTH)
- FT1555-5260UP CapSeal Capsules 52mm x 60mm (ID x LNGTH)
- FT1555-5860UP CapSeal Capsules 58mm x 60mm (ID x LNGTH)
- FT1555-6760UP CapSeal Capsules 67mm x 60mm (ID x LNGTH)
- FT1555-8060UP CapSeal Capsules 80mm x 60mm (ID x LNGTH)



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# FT1555 CapSeal system

## Capsules

FT1555 CapSeal capsules eliminate contamination by forming a clean and secure seal around hose and tube ends. FT1555 CapSeal system eliminates the need to stock multiple plastic threaded caps with just 19 CapSeal capsule sizes to meet all type of hose and tube end configurations.

Additionally, the quick and easy pull-off tab on each capsule eliminates the need for additional tools that could further contaminate the assemblies.

FT1555 CapSeal capsules are available in 19 sizes of varying diameter and length to match needs of all assemblies, and are available in both unit packaged and bulk packaged packaging.

| Unit packaged CapSeal packages | | Bulk packaged CapSeal packages | CapSeal capsule size | Hex sizes covered | | Fitting | | |
|---|---|---|---|---|---|---|---|---|
| CapSeal part # | | CapSeal part # | Packaged quantity | (mm, ID X length) | (mm) | (Inches) | Straight | Elbow* |
| FT1555-1424UP | 960 | FT1555-1424BP | 12,320 | 14x24 | 10mm to 13mm | .39" to .51" | x | X |
| FT1555-1624UP | 840 | FT1555-1624BP | 9,000 | 16x24 | 12mm to 15mm | .47" to .59" | X | x |
| FT1555-1824UP | 840 | FT1555-1824BP | 7,360 | 18x24 | 14mm to 17mm | .55" to .67" | X | x |
| FT1555-2023UP | 810 | FT1555-2023BP | 23,400 | 20 X 23 | 12mm to 18mm | 0.47" to 0.71" | | X |
| FT1555-2030UP | 810 | FT1555-2030BP | 23,400 | 20 X 30 | 12mm to 18mm | 0.47" to 0.71" | X | |
| FT1555-2224UP | 810 | FT1555-2224BP | 22,500 | 22 X 24 | 16mm to 21mm | 0.63" to 0.63" | | X |
| FT1555-2527UP | 800 | FT1555-2527BP | 17,600 | 25 X 27 | 18mm to 23mm | 0.71 to 0.91" | | X |
| FT1555-2540UP | 800 | FT1555-2540BP | 17,600 | 25 X 40 | 18mm to 23mm | 0.71" to 0.91" | X | |
| FT1555-2840UP | 720 | FT1555-2840BP | 15,200 | 28 X 40 | 22mm to 26mm | 0.87" to 1.02" | X | |
| FT1555-3133UP | 640 | FT1555-3133BP | 12,240 | 31 X 33 | 24mm to 29mm | 0.94" to 1.14" | | X |
| FT1555-3140UP | 640 | FT1555-3140BP | 12,240 | 31 X 40 | 24mm to 29mm | 0.95" to 1.14" | X | |
| FT1555-3440UP | 640 | FT1555-3440BP | 10,240 | 34 X 40 | 27mm to 32mm | 1.07" to 1.26" | X | |
| FT1555-3840UP | 560 | FT1555-3840BP | 7,800 | 38 X 40 | 30mm to 36mm | 1.19" to 1.42" | X | X |
| FT1555-4345UP | 480 | FT1555-4345BP | 6,240 | 43 X 45 | 32mm to 41mm | 1.26" to 1.61" | X | X |
| FT1555-4650UP | 480 | FT1555-4650BP | 5,760 | 46 X 50 | 34mm to 44mm | 1.34" to 1.73" | X | X |
| FT1555-5260UP | 400 | FT1555-5260BP | 4,400 | 52 X 60 | 41mm to 50mm | 1.62" to 1.97" | X | X |
| FT1555-5860UP | 400 | FT1555-5860BP | 3,600 | 58 X 60 | 49mm to 56mm | 1.93" to 2.20" | X | X |
| FT1555-6760UP | 320 | FT1555-6760BP | 2,560 | 67 X 60 | 55mm to 65mm | 2.16" to 2.56" | X | X |
| FT1555-8060UP | 320 | FT1555-8060BP | 1,736 | 80 X 60 | 64mm to 78mm | 2.52" to 3.07" | X | X |

* Shorter length CapSeal capsules are recommended for elbow and angled fittings (45° and 90°)

# FT1555 CapSeal system

## Accessories

### FT1555-HH-AK15

1-1/2" connection

- 110mm air knife to shrink CapSeal capsules
- Accommodates all CapSeal capsules

### FT1555-HH-AK20

2" connection

- 110mm air knife to shrink CapSeal capsules
- Accommodates all CapSeal capsules

### Magnetic Puck

FT1555-LMP- Large magnetic puck

FT1555-SMP- Small magnetic puck

Magnetic puck pulls nut forward on hose or tube assemblies to allow proper sealing while being placed in air knife.



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Aeroquip by Danfoss

# Danfoss branded cabinets & storage

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# Organize your inventory

**Danfoss branded stocking cabinets are the ideal way to organize your inventory of Danfoss hose ends, adapters, hoses and assembly tooling.**

## C-40X

The sturdy C-40X cabinet contains 40 heavy-duty drawers that can be divided into two, three, or four compartments providing space for a large selection of hose ends and adapters. It has mounting holes for the T-420, ET1187, and ET1000 crimp machines.

**Dimensions:**
46-1/2"H x 40"W;
26" Deep at base, 18" Deep at top.

**Weight:** 228 lbs.

## C-15X

The rugged C-15X contains 15 extra large drawers that may be divided into two or three sections for those large, difficult to store items.

**Dimensions:**
13 -5/8"H x 30 -1/4"W; 14-3/8" Deep.

**Weight:** 45 lbs.

## C-63X

This stock cabinet containing 63 drawers, which can be divided into two or three sections, is a nice addition to any store front.

**Dimensions:**
25"H x 30 -1/4"W; 9-1/4" Deep.

**Weight:** 61 lbs.

## FC-16X

The FC-16X contains 16 clear poly drawers that can be divided into two or three sections.

**Dimensions:**
11-3/4"H x 16 -1/8"W; 9" Deep.

**Weight:** 13 lbs.

## FH-135X

The sturdy FH-135X cabinet contains 50 heavy-duty drawers that can be divided into one, two, or three compartments allowing ample space for a large selection of hose ends and adapters. It includes mounting holes for the ET1187 and ET1000 crimp machines.

**Dimensions:**
46-1/2"H x 33" W; 14-1/2" Deep.

**Weight:** 115 lbs.

## FH-40X

Provides convenient storage areas for those large size fittings and hose ends. This durable 20 guage steel cabinet is made to handle abuse

**Dimensions:**
35" wide, 42" high, 12" deep

**Weight:** 200 lbs.
**NOTE:** Will not support crimp equipment.



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## C-632X

The C-632X consists of the CB-63X cabinet base, the C-15X cabinet, and two C-63X cabinets. This cabinet is a space saving, efficient addition to the modern store with a lobby type sales area. It requires a minimum amount of space, but does a maximum job merchandising a wide variety of products in 126 clear drawers.
An additional 15 large, high impact drawers located in the bottom section provide ample space for large or heavy items.

**Dimensions:**
68-1/2"H x 30" W; 15" Deep.
Weight: 167 lbs.

## HD-1X

The HD-1X cabinet offers the ideal solution for keeping 50-foot lengths of hose off the floor. Vertical slots in the cabinet keep hoses organized and clean. Consider bolting a C-15X stocking cabinet on top of the HD-1X to keep an inventory of hose ends readily available. Internal dimensions have changed from 7 narrow 4.3" sections to 5 wider 6.14" sections to accommodate larger hose sizes

**Dimensions:**
36"H x 31" W; 24" Deep.

**Weight:** 83 lbs.

## HD-2X

The HD-2X hose display is designed to support the weight of Danfoss bulk reels and boxed product.

**Dimensions:**
22" wide x 30" deep x 57" tall

**Weight:** 54 pounds

**Max Capabilities:**
3 Reels or 2 Reels with 4 boxes

## FH-72X

Large capacity all-welded cabinet provides 72 storage compartments. Fabricated from 20 guage steel, the FH-72X will provide years of continued service.

**Dimensions:**
35" wide, 42" high, 12" deep

**Weight:** 200 lbs.
**NOTE:** Will not support crimp equipment.

## FT1380DR-12

The lazy susan die cage rack offers easy 360-degree access to 12 of your FT1380 series crimp dies.

**Dimensions:**
18" wide, 10" high, 6" deep

**Weight:** 50 lbs.

## TC-20

The TC-20 cabinet provides easy access to all your tooling needs. This collet cabinet fits Danfoss' core tooling products. Standard holes fit the ET425 series collets. Inserts are provided to fit the ET313 series collets

**Dimensions:**
28-1/2"H x 26-1/2" W; 12-3/4" Deep.

**Weight:** 37.5 lbs.



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# Replacement drawers/dividers

All drawers are clear polypropylene and
all dividers are black polypropylene

| Replacement drawers/dividers | |
|---|---|
| Part # | Description |
| **PD-15** | Divider for the FH-135X and C-15X |
| **PD-49** | Drawer for the C-63X and FC-16X |
| **PD-75SET** | Divider for the C-63X and FC-16X (pack of 14) |
| **PD-95** | Drawer for the FH-135X |
| **CD-15** | Drawer for the C-15X |
| **PD-20** | Divider for the C-40X |
| **PD-40** | Drawer for the C-40X |

# Self adhesive label sets

**For C-40X, C-15X, and FH-135X cabinets**

| Self adhesive label sets | |
|---|---|
| Label # | Description |
| **FF00000** | Blank label sheet (8.5 X 11 blank bin label pages supporting up to 46 labels each) |
| **FF17266** | 1A/TTC series hose ends label set |
| **FF17266-NOBC** | 1A/TTC series hose ends label set (without barcode) |
| **FF90645** | Z series hose ends label set |
| **FF90645-NOBC** | Z series hose ends label set (without barcode) |
| **FF90646** | E-Z Clip label set |
| **FF91420** | 4S/6S series hose ends label set |
| **FF91420-NOBC** | 4S/6S series hose ends label set (without barcode) |
| **FF91475** | Core positive stop style tooling label set |
| **FF91475-NOBC** | Core positive stop style tooling label set (without barcode) |
| **FF91610** | 4TA series hose ends label set |
| **FF91610-NOBC** | 4TA series hose ends label set (without barcode) |



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Aeroquip by Danfoss

# Safety information

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# Safety Information

## Danfoss Aeroquip Hose and Fitting Assembly Product Warning

Flexible hose lines offer many advantages over rigid tubing including routing ease, vibration absorption, sound deafening and the ability to accommodate movement of connected components. However, hose lines require caution in use not only to provide long service, but also to guard against potentially dangerous failure.

### Important

The user should carefully observe the precautions listed in this catalog, including the recommendations on the selection of hose and fittings on the relevant pages, and the pages on fluid compatibility. In addition, care should be taken not to exceed the minimum bend radius listed for each hose size and type in the hose section. Maximum operating pressure should not exceed pressures listed in the hose data. Instructions for assembling fittings to different hose should be followed carefully to ensure the performance of the completed assembly.

**WARNING ⚠**

Danfoss fitting tolerances are engineered to match Danfoss' Aeroquip hose tolerances. The use of Danfoss fittings on hose supplied by other manufacturers and/or the use of Danfoss' Aeroquip hose with fittings supplied by other manufactures may result in the production of unreliable and unsafe hose assemblies and is neither recommended nor authorized by Danfoss or any of its affiliates or subsidiaries.

**WARNING ⚠**

Application considerations must be observed in selecting appropriate components for the application of these products contained herein. The failure to follow the recommendations set forth in this catalog may result in an unstable application which may result in serious personal injury or property damage.

DANFOSS OR ANY OF ITS AFFILIATES OR SUBSIDIARIES SHALL NOT BE SUBJECT TO AND DISCLAIMS ANY OBLIGATIONS OR LIABILITIES (INCLUDING BUT NOT LIMITED TO ALL CONSEQUENTIAL, INCIDENTAL AND CONTINGENT DAMAGES) ARISING FROM TORT CLAIMS (INCLUDING WITHOUT LIMITATION NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORIES OF LAW WITH RESPECT TO ANY HOSE ASSEMBLIES NOT PRODUCED FROM GENUINE AEROQUIP HOSE FITTINGS, HOSE AND AEROQUIP APPROVED EQUIPMENT, AND IN CONFORMANCE WITH DANFOSS' AEROQUIP PROCESS AND PRODUCT INSTRUCTIONS FOR EACH SPECIFIC HOSE ASSEMBLY.

Failure to follow these processes and product instructions and limitations could lead to premature hose assembly failures resulting in property damage, serious injury or death.

### Routing

If the user follows the recommendations on hose line routing and installation as provided herein, improved safety and longer service life of any hose installation will result.

### Hose Installation

Proper installation of the hose is essential to the proper operation and safe use of the hose and related equipment. Improper installation of the hose can result in serious injury or property damage caused by spraying fluids or flying projectiles. In order to avoid serious bodily injury or property damage resulting from improper installation of the hose, you should carefully review the information in this catalog regarding hose installation.

Some of the factors you must consider in installing the hose properly are:

- Changes in length
- Proper bend radius
- Protection from high temperature sources
- Elbows and adapters to relieve strain
- Rubbing or abrasion
- Twisting
- Improper hose movement

These factors and the other information in this catalog regarding hose installation should be considered by you before installing the hose. If you have any questions regarding proper hose installation, please contact Danfoss Technical Support at 1-888-258-0222.

### Hose Maintenance

Proper maintenance of the hose is essential to the safe use of the hose and related equipment. Hose should be stored in a dry place. Hose should also be visually inspected. Any hose that has a cut or gouge in the cover that exposes the reinforcement should be retired from service. Hoses should also be inspected for kinking or broken reinforcement. If the outside diameter of the hose is reduced by 20% at the spot where it is bent then the hose should be retired from service. Inadequate attention to maintenance of the hose can result in hose leakage, bursting, or other failure which can cause serious bodily injury or property damage from spraying fluids, flying projectiles, or other substances.



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## Selection, installation and maintenance of hose and assemblies

The following recommendations on selection, installation and maintenance of hose assemblies were established in SAE J1273. Please read these general instructions carefully. More detailed information on many of these subjects is covered in this catalog.

### 1. Scope

Hose (also includes hose assemblies) has a finite life and there are a number of factors which will reduce its life. This recommended practice is intended as a guide to assist system designers and/or users in the selection, installation, and maintenance of hose.

The designers and users must make a systematic review of each application and then select, install, and maintain the hose to fulfill the requirements of the application. The following are general guidelines and are not necessarily a complete list.

**WARNING ⚠**

Improper selection, installation, or maintenance may result in premature failures, bodily injury, or property damage.

### 2. References

**2.1 Applicable documents**

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

**2.1.1 SAE publications**

Available from SAE,
400 Commonwealth Drive, Warrendale, PA 15096-0001.
J516—Hydraulic hose fittings
J517—Hydraulic hose

### 3. Selection

The following is a list of factors which must be considered before final hose selection can be made.

**3.1 Pressure**

After determining the system pressure, hose selection must be made so that the recommended maximum operating pressure is equal to or greater than the system pressure. Surge pressures higher than the maximum operating pressure will shorten hose life and must be taken into account by the hydraulic designer.

**3.2 Suction**

Hoses used for suction applications must be selected to insure the hose will withstand the negative pressure of the system.

**3.3 Temperature**

Care must be taken to insure that fluid and ambient temperatures, both static and transient, do not exceed the limitations of the hose. Special care must be taken when routing near hot manifolds.

**3.4 Fluid compatibility**

Hose selection must assure compatibility of the hose tube, cover and fittings with the fluid used. Additional caution must be observed in hose selection for gaseous applications.

**3.5 Size**

Transmission of power by means of pressurized fluid varies with pressure and rate of flow. The size of the components must be adequate to keep pressure losses to a minimum and avoid damage to the hose due to heat generation or excessive turbulence.

**3.6 Routing**

Attention must be given to optimum routing to minimize inherent problems.

**3.7 Environment**

Care must be taken to insure that the hose and fittings are either compatible with or protected from the environment to which they are exposed. Environmental conditions such as ultraviolet light, ozone, salt water, chemicals, and air pollutants can cause degradation and premature failure and, therefore, must be considered.

**3.8 Mechanical loads**

External forces can significantly reduce hose life. Mechanical loads which must be considered include excessive flexing, twist, kinking, tensile or side loads, bend radius, and vibration. Use of swivel-type fittings or adapters may be required to insure no twist is put into the hose. Unusual applications may require special testing prior to hose selection.

**3.9 Abrasion**

While hose is designed with a reasonable level of abrasion resistance, care must be taken to protect the hose from excessive abrasion which can result in erosion, snagging and cutting of the hose cover. Exposure of the reinforcement will significantly accelerate
hose failure.

**3.10 Proper end fitting**

Care must be taken to insure proper compatibility exists between the hose and coupling selected based on the manufacturer's recommendations substantiated by testing to industry standards such as SAE J517. End fitting components from one manufacturer are usually not compatible with end fitting components supplied by another manufacturer (i.e., using a hose fitting nipple from one manufacturer with a hose socket from another manufacturer). It is the responsibility of the fabricator to consult the manufacturer's written instructions or the manufacturer directly for proper end fitting componentry.

**3.11 Length**

When establishing proper hose length, motion absorption, hose length changes due to pressure, as well as hose and machine tolerances must be considered.

**3.12 Specifications and standards**

When selecting hose, government, industry and manufacturers' specifications and recommendations must be reviewed as applicable.

**3.13 Hose cleanliness**

Hose components vary in cleanliness levels. Care must be taken to insure that the assemblies selected have an adequate level of cleanliness for the application.

**3.14 Electrical conductivity**

Certain applications require that hose be nonconductive to prevent electrical current flow. Other applications require the hose to be sufficiently conductive to drain off static electricity. Hose and fittings must be chosen with these needs in mind.

### 4. Installation

After selection of proper hose, the following factors must be considered by the installer.

**4.1 Pre-installation inspection**

Prior to installation, a careful examination of the hose must be performed. All components must be checked for correct style, size and length. In addition, the hose must be examined for cleanliness, I.D. obstructions, blisters, loose cover, or any other visible defects.



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# Selection, installation and maintenance of hose and assemblies

**The following recommendations on selection, installation and maintenance of hose assemblies were established in SAE J1273. Please read these general instructions carefully. More detailed information on many of these subjects is covered in this catalog.**

**4.2 Follow manufacturers' assembly instructions**
Hose assemblies may be fabricated by the manufacturer, an agent for or customer of the manufacturer, or by the user. Fabrication of permanently attached fittings to hydraulic hose requires specialized assembly equipment. Field attachable fittings (screw style and segment clamp style) can usually be assembled without specialized equipment although many manufacturers provide equipment to assist in the operation.
SAE J517 hose from one manufacturer is usually not compatible with SAE J516 fittings supplied by another manufacturer. It is the responsibility of the fabricator to consult the manufacturer's written assembly instructions or the manufacturers directly before intermixing hose and fittings from two manufacturers. Similarly, assembly equipment from one manufacturer is usually not interchangeable with that of another manufacturer. It is the responsibility of the fabricator to consult the manufacturer's written instructions or the manufacturer directly for proper assembly equipment. Always follow the manufacturer's instructions for proper preparation and fabrication of hose assemblies.

**4.3 Minimum bend radius**
Installation at less than minimum bend radius may significantly reduce hose life. Particular attention must be given to preclude sharp bending at the hose/fitting juncture.

**4.4 Twist angle and orientation**
Hose installations must be such that relative motion of machine components produces bending of the hose rather than twisting.

**4.5 Securement**
In many applications, it may be necessary to restrain, protect, or guide the hose to protect it from damage by unnecessary flexing, pressure surges, and contact with other mechanical components. Care must be taken to insure such restraints do not introduce additional stress or wear points.

**4.6 Proper connection of ports**
Proper physical installation of the hose requires a correctly installed port connection while insuring that no twist or torque is put into the hose.

**4.7 Avoid external damage**
Proper installation is not complete without insuring that tensile loads, side loads, kinking, flattening, potential abrasion, thread damage, or damage to sealing surfaces are corrected or eliminated.

**4.8 System check out**
After completing the installation, all air entrapment must be eliminated and the system pressurized to the maximum system pressure and checked for proper function and freedom from leaks.
**NOTE:** Avoid potential hazardous areas while testing.

## 5. Maintenance

Even with proper selection and installation, hose life may be significantly reduced without a continuing maintenance program. Frequency should be determined by the severity of the application and risk potential. A maintenance program should include the following as a minimum.

**5.1 Hose storage**
Hose products in storage can be affected adversely by temperature, humidity, ozone, sunlight, oils, solvents, corrosive liquids and fumes, insects, rodents and radioactive materials. Storage areas should be relatively cool and dark and free of dust, dirt, dampness and mildew.

**5.2 Visual inspection**
Any of the following conditions requires replacement of the hose: Leaks at fitting or in hose (leaking fluid is a fire hazard). Damaged, cut, or abraded cover (any reinforcement exposed)
Kinked, crushed, flattened, or twisted hose
Hard, stiff, heat cracked or charred hose
Blistered, soft, degraded, or loose cover
Cracked, damaged, or badly corroded fittings
Fitting slippage on hose

**5.3 Visual inspection**
The following items must be tightened, repaired, or replaced as required:
Leaking port conditions
Clamps, guards, shields
Remove excessive dirt buildup
System fluid level,fluid type, and any air entrapment

**5.4 Functional test**
Operate the system at maximum operating pressure and check for possible malfunctions and freedom from leaks.

**NOTE:** Avoid potential hazardous areas while testing.

**5.5 Replacement intervals**
Specific replacement intervals must be considered based on previous service life, government or industry recommendations, or when failures could result in unacceptable down time, damage, or injury risk.



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# How to order

Accurate processing and prompt delivery of your order depends on easy identification of your requirements. Please order Aeroquip brand parts using correct part numbers as described in this catalog. Inquiries and orders should be directed to your Aeroquip distributor or:

**Danfoss**
14615 Lone Oak Road
Eden Prairie, MN 55344
952-937-9800;
888-258-0222;
Fax: 952-974-7722
www.Danfoss.com/hydraulics

## Part numbers and dash sizes

Dash size designates the nominal size in 16th of an inch. This number immediately follows the part number and is separated from it with a dash.

## Dimensions

Dimensions given in this catalog for Aeroquip products are approximate and should be used for reference only. Exact dimensional information for a given product is subject to change and varying tolerances; contact Danfoss directly for full current information.

**WARNING ⚠**

## Hose assemblies

Danfoss manufactures the terminal ends of our hose fittings to the appropriate requirements established by the SAE. Therefore, the performance ratings of these hose fittings meet the SAE requirements. It is possible to order a hose assembly with a fitting terminal end that has a performance rating lower than the hose rating. When ordering hose assemblies, please keep the connecting end performance rating in mind since this may affect overall hose assembly performance. Hose assembly components (hose and fittings) are easily assembled in the field. However, factory assembled reusable and crimped hose assemblies are available. For complete information,contact Danfoss.



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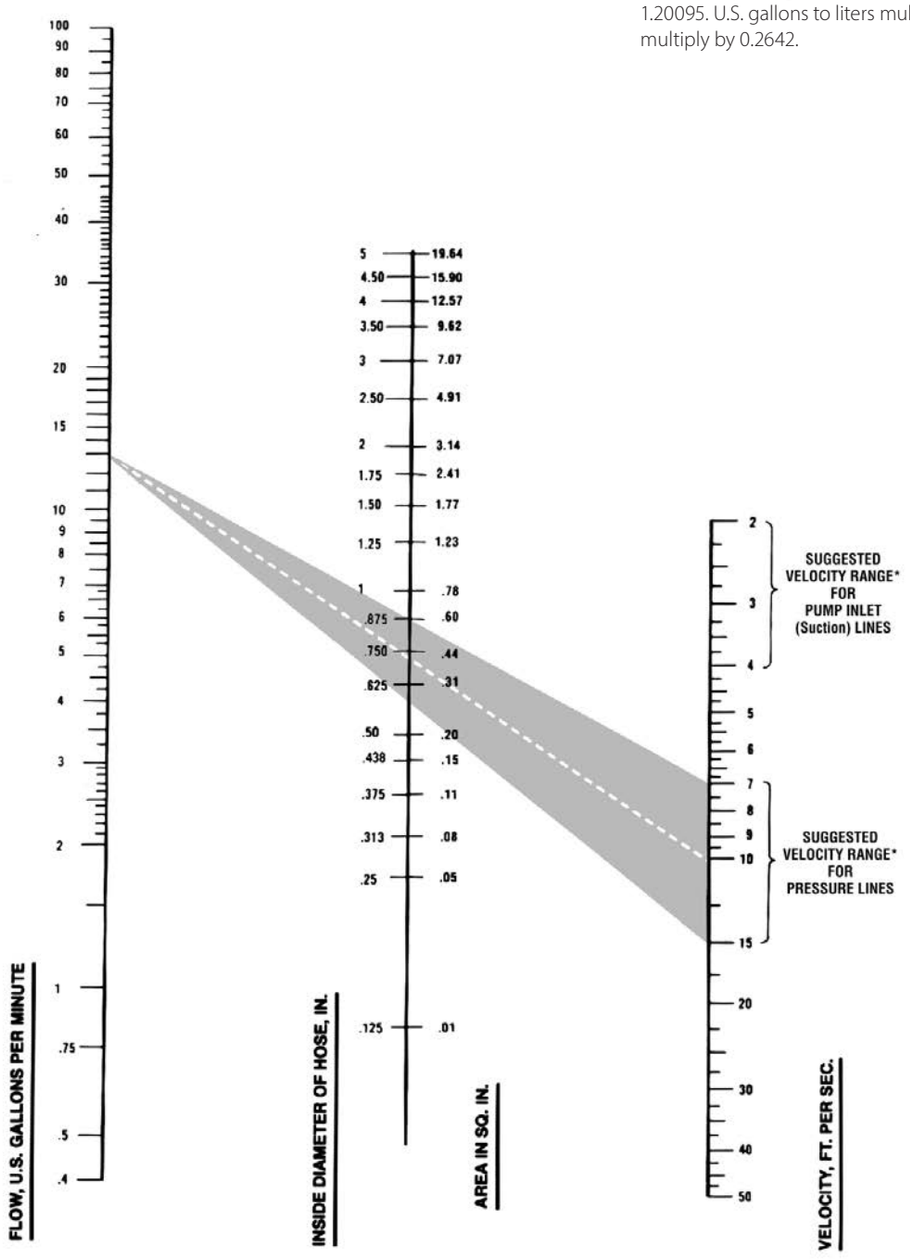
## Flow capacities of hose assemblies at suggested flow velocities

The chart below is designed and provided as an aid in the determination of the correct hose size.

**Example:** At 13 U.S. gallons per minute, what is proper hose size within the suggested velocity range for pressure lines?

**Solution:** Locate 13 U.S. gallons per minute in the left hand column and 10 feet per second in the right hand column (the center of the suggested velocity range for pressure lines). Lay a straightedge across the two points. The inside diameter is shown in the center column nearest the straight edge.




For suction hose, follow the same procedure except use suggested velocity range for pump inlet lines in the right hand column.

### Based on formula

$$\text{Area (sq. in.)} = \frac{\text{G.P.M. x 0.3208}}{\text{Velocity (FT./SEC.)}}$$

* Suggestions are for oils having a maximum viscosity of 315 S.S.U. at +100°F (+38°C) and operating at temperatures between +65°F and +155°F (+54°C to +69°C). Under certain conditions, velocities in pressure lines can be increased up to 25 feet per second. Contact Aeroquip® with specific information on your application.

### Conversions

To convert U.S. gallons into Imperial gallons multiply U.S. gallons by 0.83267. Imperial gallons into U.S. gallons multiply Imperial gallons by 1.20095. U.S. gallons to liters multiply by 3.785. Liters to U.S. gallons, multiply by 0.2642.



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# Flow capacities pressure drop

Pressure drop in psi (pounds per square inch)/ gpm (gallons per minute) for 10 feet of hose (smooth bore) without fittings.

Fluid specification:

Specific gravity = 0.85;
Viscosity = v =
20 centistokes (C.S.),
(20 C.S. = 97 S.S.U.).

## Hose pressure drop

| Hose dash size | -04 | | -05 | | -06 | | -08 | | -10 | | -12 | | -16 | | -20 | | -24 | | -32 | | -40 | -48 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hose I.D. (inches) | 0.19 | 0.25 | 0.25 | 0.31 | 0.31 | 0.38 | 0.41 | 0.50 | 0.50 | 0.63 | 0.63 | 0.75 | 0.88 | 1.00 | 1.13 | 1.25 | 1.38 | 1.50 | 1.81 | 2.00 | 2.38 | 3.00 |
| U.S. gallons per minute 0.25 | 10 | 3.1 | 3.1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.50 | 19 | 6 | 6 | 2.7 | 2.7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1 | 40 | 12 | 12 | 5.5 | 5.5 | 2.4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 | 95 | 24 | 24 | 10 | 10 | 4.8 | 3.5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 3 | 185 | 46 | 46 | 17 | 17 | 7 | 5 | 2.2 | 2.2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 | - | 78 | 78 | 29 | 29 | 12 | 8 | 3 | 3 | 1.2 | 1.2 | - | - | - | - | - | - | - | - | - | - | - |
| 5 | - | 120 | 120 | 44 | 44 | 18 | 12 | 4.5 | 4.5 | 1.6 | 1.6 | 0.72 | - | - | - | - | - | - | - | - | - | - |
| 8 | - | - | - | 95 | 95 | 39 | 26 | 10 | 10 | 3.6 | 3.6 | 1.4 | 0.60 | - | - | - | - | - | - | - | - | - |
| 10 | - | - | - | - | - | 59 | 40 | 15 | 15 | 5.7 | 5.7 | 2 | 1 | 0.55 | - | - | - | - | - | - | - | - |
| 12 | - | - | - | - | - | 80 | 52 | 20 | 20 | 7.2 | 7.2 | 2.6 | 1.5 | 0.75 | 0.43 | - | - | - | - | - | - | - |
| 15 | - | - | - | - | - | - | 75 | 30 | 30 | 10 | 10 | 4.2 | 2.2 | 1.2 | 0.67 | 0.38 | - | - | - | - | - | - |
| 18 | - | - | - | - | - | - | 107 | 40 | 40 | 15 | 15 | 6.3 | 3 | 1.5 | 0.70 | 0.55 | 0.35 | - | - | - | - | - |
| 20 | - | - | - | - | - | - | - | 49 | 49 | 19 | 19 | 8 | 3.4 | 2 | 1.1 | 0.65 | 0.43 | 0.27 | - | - | - | - |
| 25 | - | - | - | - | - | - | - | 72 | 72 | 26 | 26 | 11 | 5.5 | 3 | 1.6 | 1 | 0.64 | 0.40 | 0.17 | - | - | - |
| 30 | - | - | - | - | - | - | - | - | - | 34 | 34 | 14 | 7 | 3.6 | 2.2 | 1.3 | 0.80 | 0.52 | 0.22 | 0.14 | - | - |
| 35 | - | - | - | - | - | - | - | - | - | 47 | 47 | 19 | 9.5 | 5 | 2.8 | 1.7 | 1.1 | 0.70 | 0.27 | 0.18 | - | - |
| 40 | - | - | - | - | - | - | - | - | - | - | - | 25 | 12 | 6.5 | 3.4 | 2.2 | 1.4 | 0.90 | 0.38 | 0.24 | - | - |
| 50 | - | - | - | - | - | - | - | - | - | - | - | 36 | 17 | 9 | 5.3 | 3.3 | 2 | 1.3 | 0.54 | 0.35 | 0.15 | - |
| 60 | - | - | - | - | - | - | - | - | - | - | - | 50 | 23 | 12 | 7.5 | 4.4 | 2.8 | 1.8 | 0.75 | 0.45 | 0.20 | - |
| 70 | - | - | - | - | - | - | - | - | - | - | - | - | 31 | 17 | 9.3 | 6 | 3.8 | 2.4 | 1 | 0.65 | 0.30 | - |
| 80 | - | - | - | - | - | - | - | - | - | - | - | - | 38 | 21 | 12 | 7.1 | 4.6 | 3 | 1.2 | 0.76 | 0.34 | 0.11 |
| 90 | - | - | - | - | - | - | - | - | - | - | - | - | 49 | 27 | 15 | 9 | 5.9 | 3.8 | 1.5 | 1 | 0.45 | 0.13 |
| 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | 33 | 19 | 12 | 7 | 4.7 | 1.9 | 1.3 | 0.55 | 0.18 |
| 150 | - | - | - | - | - | - | - | - | - | - | - | - | - | 60 | 36 | 22 | 13 | 8.5 | 3.4 | 2.2 | 1 | 0.33 |
| 200 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 36 | 23 | 15 | 6 | 3.9 | 1.7 | 0.55 |
| 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 54 | 33 | 22 | 8.5 | 5.3 | 2.5 | 0.75 |
| 300 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 45 | 29 | 12 | 7.5 | 4 | 1.1 |
| 400 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 51 | 21 | 14 | 6.5 | 2.2 |
| 500 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 32 | 20 | 10 | 3 |
| 800 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 18 | 5 |
| 1000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 |

* Pressure drop values listed are typical of many petroleum based hydraulic oils at approximately +100°F (+38°C). Differences in fluids, fluid temperature and viscosity can increase or decrease actual pressure drop compared to the values listed.

To convert

To convert U.S. gallons into Imperial gallons multiply U.S. gallons by 0.83267. Imperial gallons into U.S. gallons multiply Imperial gallons by 1.20095. U.S. gallons to litres multiply by 3.785. Litres to U.S. gallons, multiply by 0.2642.



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## Thread style pressure performance

Danfoss closely follows industry standards in design and in application recommendations. A key principle within ISO, SAE and other standards bodies is that the **maximum dynamic working pressure of the hose or adapter assembly** is the lesser of the hose and end connector(s) used.

The first table below provides excerpts from standard industry pressure rating charts for connector types as published by SAE (Society of Automotive Engineers).

**Note 1:** The tables below are applicable for low carbon free machining steels typically used in Fluid Power connections. For port type connections, the material and design of the port must be considered and may reduce expected strength.

**Note 2:** For high pressure applications Danfoss recommends the use of more robust connector designs such as Code 62 flange or O-Ring face seal.

**Note 3:** Some Danfoss products have higher pressure ratings. Refer to the product page for specific pressure ratings.

Selected SAE pressure ratings

| Dash size | Inch size | 37° | Pipe SAE J476 | Male ORB SAE J1926 ORS adapt. | Male ORB SAE J1926 non-ORS adapt. | Adjustable SAE J1926 ORS | Adjustable ORB non-ORS | ORS | Inverted flare | Code 61 Flange | Code 62 Flange |
|---|---|---|---|---|---|---|---|---|---|---|---|
| -2 | 1/8 | 5000 | 5000 | - | 5000 | - | 5000 | - | 5000 | - | - |
| -3 | 3/16 | 5000 | - | 9000 | 5000 | 6000 | 5000 | - | 5000 | - | - |
| -4 | 1/4 | 4500 | 5000 | 9000 | 5000 | 6000 | 4500 | 9000 | 4500 | - | - |
| -5 | 5/16 | 4000 | - | 9000 | 5000 | 6000 | 4500 | 9000 | 4000 | - | - |
| -6 | 3/8 | 4000 | 4000 | 9000 | 5000 | 6000 | 4000 | 9000 | 4000 | - | - |
| -8 | 1/2 | 4000 | 3000 | 9000 | 4500 | 6000 | 4000 | 9000 | 4000 | 5000 | 6000 |
| -10 | 5/8 | 3000 | - | 9000 | 3500 | 6000 | 3000 | 6000 | 3000 | - | - |
| -12 | 3/4 | 3000 | 2500 | 6000 | 3500 | 6000 | 3000 | 6000 | 3000 | 5000 | 6000 |
| -14 | 7/8 | 2500 | - | 6000 | 3000 | 6000 | 2500 | 6000 | 2500 | - | - |
| -16 | 1 | 2500 | 2000 | 6000 | 3000 | 5000 | 2500 | 6000 | 2500 | 5000 | 6000 |
| -20 | 1 1/4 | 2000 | 1150 | 4000 | 2500 | 4000 | 2000 | 3600 | 2000 | 4000 | 6000 |
| -24 | 1 1/2 | 1500 | 1000 | 4000 | 2500 | 3000 | 2000 | 3600 | 1500 | 3000 | 6000 |
| -32 | 2 | 1125 | 1000 | 3000 | 2000 | 2500 | 1500 | 3000 | 1125 | 3000 | 6000 |

### International pressure rating charts

Maximum working pressure (PSI)

| Hose fitting connection | Hose fitting size | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | -04 | -05 | -06 | -08 | -10 | -12 | -16 | -20 | -24 | -32 |
| Male British Pipe (BSP) | 5000 | - | 4000 | 4000 | 3500 | 4000 | 3500 | 2500 | 2,000 | 2000 |
| Female British Pipe (BSP) | 5000 | - | 4000 | 4000 | 3500 | 4000 | 3500 | 2500 | 2,000 | 2000 |
| Female Pipe (JIS) | 5000 | - | 5000 | 5000 | - | 4000 | 4000 | - | - | - |

Maximum working pressure (PSI)

| Hose fitting Connection | Hose fitting size | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | -06 | -08 | -10 | -12 | -15 | -18 | -22 | -28 | -35 | -42 |
| DIN light | 3625 | 3625 | 3625 | 3625 | 3625 | 2325 | 2325 | 1450 | 1450 | 1450 |



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# Hose fitting pressure charts

## All Danfoss components

With higher pressures it is critical to know the construction materials and manufacturing method to ensure performance. When all components in a system are Danfoss supplied, for example an Danfoss hose fitting is mated with an Danfoss adapter or tube fitting, the combination may be used at higher pressures with confidence. These higher ratings are noted in the chart below.

**Maximum dynamic working pressure of the hose or adapter assembly is the lesser of the hose and end connector(s) used.**

All Danfoss pressure ratings[1]

| Dash Size | Inch Size | 37° JIC | Male Pipe | Female Pipe[2] | Male ORB ORS Adapters | Male ORB Non-ORS Adapters | Adjustable ORB ORS Adapters | Adjustable ORB Non-ORS Adapters | ORS | Male Flareless Ermeto | Code 61 | Code 62 | STC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -2 | 1/8 | - | 10000 | 6000 | - | 5000 | - | 5000 | - | 5000 | - | - | - |
| -3 | 3/16 | - | - | - | 9000 | 5000 | 6000 | 5000 | - | 5000 | - | - | - |
| -4 | 1/4 | 7000 | 9500 | 5000 | 9000 | 5000 | 6000 | 4500 | 9000 | 4500 | - | - | 6000 |
| -5 | 5/16 | 7000 | - | - | 9000 | 5000 | 6000 | 4500 | - | 4000 | - | - | - |
| -6 | 3/8 | 5000 | 8000 | 4000 | 9000 | 5000 | 6000 | 4000 | 9000 | 4000 | - | - | 5000 |
| -8 | 1/2 | 4000 | 6000 | 4000 | 9000 | 4500 | 6000 | 4000 | 9000 | 4000 | 5000 | 6000 | 4250 |
| -10 | 5/8 | 3800 | - | - | 9000 | 3500 | 6000 | 3000 | 9000 | 3000 | - | - | 4000 |
| -12 | 3/4 | 5000 | 5000 | 3500 | 6000 | 3500 | 6000 | 3000 | 6000 | 3000 | 5000 | 6000 | 4000 |
| -14 | 7/8 | - | - | - | 6000 | 3000 | 6000 | 2500 | - | 2500 | - | - | - |
| -16 | 1 | 5000 | 4000 | 3000 | 6000 | 3000 | 5000 | 2500 | 6000 | 2500 | 5000 | 6000 | 4000 |
| -20 | 1 1/4 | 5000 | 3000 | 2000 | 4000 | 2500 | 4000 | 2000 | 4500 | 2000 | 4000 | 6000 | - |
| -24 | 1 1/2 | 2100 | 2000 | 1500 | 4000 | 2500 | 3000 | 2000 | 4000 | 1500 | 3000 | 6000 | - |
| -32 | 2 | 1750 | 2000 | 1500 | 3000 | 2000 | 2500 | 1500 | 3000 | 1125 | 3000 | 6000 | - |

1) These ratings are based on both brazed and one piece construction, one-piece pressures could be increased. Please contact Danfoss in these situations.
2) This rating is for thin walled adapters or fittings, the use of manifolds or oversized female ports would allow full rated male pressures.

### Dynamic operating pressure

Dynamic operating conditions refers to cyclic pressure impulses, usually considered to be from near zero to the highest system pressure. Hydraulic standards typically represent these as square waves and expect a component to handle on the order of 200,000 to well over one million such cycles with a burst: operating safety factor of 4:1. The above charts are created with dynamic applications in mind. Most industrial and mobile hydraulic systems fit the dynamic operating pressure profile, for example hydraulic work circuits on construction equipment or on injection molding equipment.

### Static operating pressure

Static operating conditions typically range from zero to operating pressure, but with far fewer cycles expected for the system life – perhaps 30,000 to 50,000 cycles and sharp pressure spikes are not expected, allowing a burst: operating safety factor of 3:1 or less. For static operating conditions, the Danfoss ratings above can be safely increased by 25-30%. For example, a 3000 psi dynamic rated hose might be used in a 4000 psi static pressure application. Typical examples of static applications are water blast and hydraulic jacking.

### Materials

The above tables represent performance using common low carbon steel material. Other materials and their characteristics influence these ratings. Medium carbon steels or heat treated materials can support higher working pressures. Conversely non-ferrous materials such as aluminum or brass will have reduced capability – as much as 50%, or less, pressure handling capability. It is important to consider material properties in designing a system to ensure pressure rating compatibility of all materials.

### Design & application

Danfoss' Fluid Conveyance engineering and support teams have many decades of experience in designing, manufacturing and servicing hydraulic and other fluid conveyance systems globally. Danfoss' product line is designed as a comprehensive collection of hose, fittings, connectors, couplings and accessories that allow a system designer to select components to complete a fluid power system or a service technician to replace a component with confidence. The individual product specifications, the above pressure ratings and other technical information are intended as supporting guidelines for system design and service needs and are not to be construed as a guarantee of performance of the system or of individual Danfoss components. Danfoss provides comprehensive technical support so please call with questions about pressure needs not covered by these charts or for specific application support.



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# Fluid compatibility

This chart indicates the suitability of various elastomers and metals for use with fluids to be conveyed. It is intended as a guide only and is not a guarantee. Final selection of the proper hose style, seal, or material of metal components is further dependent on many factors including pressure, fluid and ambient temperature, concentration, duration of exposure, etc.

## How to use the chart

1. The chart has separate sections for rating elastomers for use as hose inner tubes and as seals. Ratings for a given elastomer may not always be the same in both sections.
2. Both the elastomer and the metal must be considered when determining suitability of a combination for a hose assembly, adapter with o-ring, swivel joint or coupling.
3. Locate the fluid to be conveyed and determine the suitability of the elastomeric and metal components according to the resistance ratings shown for each.
4. Refer to the inner tube materials groupings under "Hose tube identification".
5. Dimensional and operating specifications for each hose can be found on the catalog pages shown with each hose part number.
6. Information on o-rings and seal options for swivel joints and couplings, and how to specify them, are shown in the respective sections of this catalog.
7. For further details on the products shown in this catalog, and their applications, contact:

**Danfoss**
14615 Lone Oak Road,
Eden Prairie, MN 55344
USA
952-937-9800
Fax: 952-974-7722
1-888-258-0222
www.Danfoss.com

## Resistance key rating

**E** = Excellent – Fluid has little or no effect.

**G** = Good – Fluid has minor to moderate effect.

**C** = Conditional – Service conditions should be described to Danfoss Aeroquip for determination of suitability for application.

**U** = Unsatisfactory

The differences between ratings "E" and "G" are relative.
Both indicate satisfactory service. Where there is a choice, the
materials rated "**E**" may be expected to give better or longer service than those rated "**G**".

**NOTE:** Special precautions are necessary in gaseous applications due to the potential volume of gaseous fluid in the system. Unless the cover is perforated, hose styles with rubber or thermoplastic covers are not suitable for gases above 250 psi. Hose styles with perforated covers are so noted in their construction descriptions.

**WARNING ⚠**

**Compatibility of hose fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the connection with the potential of causing severe personal injury or property damage.**

## Seal elastomer data

| Seal elastomer | | Max. operating temperature range |
|---|---|---|
| Buna-N† | none | –40°C to +121°C [–40°F to +250°F] |
| Neoprene | none | –54°C to +100°C [–65°F to +212°F] |
| EPR (Ethylene Propylene Rubber)/ EPDM | none | –54°C to +149°C [–65°F to +300°F] |
| Viton* | | –29°C to +204°C [–15°F to +400°F] |

†Buna-N temperature range -65°F to +225°F. Also per MIL-R-6855.

*Viton is a trademark of The Chemours Company FC, LLC.

## Hose tube identification

1. Synthetic rubber
2. PTFE
3. Synflex thermoplastic elastomer
4. CPE
5. Special application hose (not included in fluid chart)
   - Fuel
   - LPG
   - Railroad air brake
   - Silicone
   - Truck air brake
   - A/C
6. EPDM rubber

The Fluid Compatibility chart is intended for reference use only.

The information in this chart pertains strictly to material compatibility and is not intended to be used as an application guide. For information on specific applications not included in this catalog, please contact Danfoss Aeroquip.

Note 1 - Rubber-covered hose must be perforated to allow gas to escape.

Note 2 - Due to the widely different additives in these fluids, testing should be done on the actual fluid being considered.



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†Hytrel is a registered trademark of E.I. du Pont.
‡Monel is a registered trademark of Special Metals Corporation group of Companies.
Note 1 - Rubber-covered hose must be perforated to allow gas to escape.
Note 2 - Due to the widely different additives in these fluids, testing should be done on the actual fluid being considered.

# Fluid compatibility

**E**=Excellent
**G**=Good
**C**=Conditional
**U**=Unsatisfactory

| Fluid | Hose | | | | | | Seals | | | | | | Metal | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 Synthetic rubber | 2 PTFE | 3 Thermoplastic elastomer | 4 CPE | 5 Special application hose | 6 EPDM | Buna-N | Neoprene | EPR | Viton* | Urethane | Hytrel† | Steel | Brass | Stainless steel | Aluminum | Monel‡ |
| **Acetaldehyde** | U | E | C | U | - | G | U | C | C | U | U | G | G | E | E | E | E |
| Acetic acid, 10% | U | E | C | C | - | E | U | U | E | G | U | C | U | U | C | C | U |
| Acetic acid, glacial | U | E | C | C | - | E | U | U | C | U | U | C | U | U | C | C | C |
| Acetone | U | E | G | U | - | E | U | U | G | U | U | G | E | E | E | E | E |
| Acetophenone | U | E | - | U | - | E | U | U | E | U | U | - | E | E | E | C | E |
| Acetyl acetone | U | E | U | U | - | E | U | U | G | U | U | G | U | C | C | C | C |
| Acetyl chloride | U | E | U | U | - | U | U | U | U | E | U | U | C | C | C | U | E |
| Acetylene[1] | G | E | G | G | - | E | U | U | G | E | G | G | E | E | E | E | E |
| Air, hot (up to +160°F)1 | E | E | E | E | - | E | E | E | E | E | E | E | E | E | E | E | E |
| Air, hot (161°F – 200°F)[1] | C | E | U | E | - | E | G | G | E | E | G | G | E | E | E | E | E |
| Air, hot (201°F – 300°F)[1] | U | E | U | C | - | G | U | U | G | E | U | U | E | E | E | E | E |
| Air wet, below 160°F[1] | E | E | C | E | - | E | E | E | E | E | G | C | U | G | E | E | E |
| Aluminum chloride, 10% aq | E | E | E | E | - | E | E | E | E | E | G | E | U | U | U | U | U |
| Aluminum fluoride, 10% aq | E | E | E | U | - | E | E | E | E | E | G | E | U | U | U | E | C |
| Aluminum nitrate, 10% aq | E | E | E | C | - | E | E | E | E | E | G | E | U | U | C | C | C |
| Aluminum sulfate, 10% aq | E | E | G | E | - | E | E | E | E | E | - | G | U | C | E | C | C |
| Alums, 10% aq | E | E | E | E | - | E | E | E | E | E | E | E | U | C | E | C | C |
| Ammonia, anhydrous[1] | C | U | U | C | - | E | E | E | E | U | - | - | E | U | E | E | E |
| Ammonia, aqueous | G | G | U | C | - | E | E | E | E | U | - | - | E | U | E | E | E |
| Ammonium carbonate, 10% aq | U | E | C | U | - | E | U | E | E | U | - | C | C | U | C | C | C |
| Ammonium chloride, 10% aq | E | E | C | U | - | E | E | E | E | U | - | - | U | U | C | U | C |
| Ammonium hydroxide, 10% aq | U | E | U | U | - | E | C | C | E | C | U | U | G | U | C | C | U |
| Ammonium nitrate, 10% aq | E | E | C | U | - | E | E | G | E | U | G | C | G | U | G | G | U |

## Resistance key rating

**E** = Excellent – Fluid has little or no effect.
**G** = Good – Fluid has minor to moderate effect.
**C** = Conditional – Service conditions should be described to Danfoss Aeroquip for determination of suitability for application.
**U** = Unsatisfactory

| Fluid | Hose | | | | | | Seals | | | | | | Metal | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 Synthetic rubber | 2 PTFE | 3 Thermoplastic elastomer | 4 CPE | 5 Special application hose | 6 EPDM | Buna-N | Neoprene | EPR | Viton* | Urethane | Hytrel† | Steel | Brass | Stainless steel | Aluminum | Monel‡ |
| Ammonium phosphate, 10% aq | E | E | C | U | - | E | E | E | E | - | G | C | U | C | G | U | G |
| Ammonium sulfate/sulfide, 10% aq | E | E | C | U | - | E | E | E | E | U | G | C | U | U | G | U | G |
| Amyl acetate | U | E | U | U | - | E | U | U | G | U | U | U | E | E | E | E | E |
| Amyl alcohol | G | E | E | C | - | E | G | C | E | G | C | E | G | G | E | U | G |
| Aniline, aniline oil | U | E | U | U | - | E | U | U | G | U | U | U | E | U | E | G | G |
| Aniline dyes | U | E | U | U | - | E | U | G | G | G | U | U | U | C | G | C | G |
| Asphalt, < 200°F | C | E | G | G | - | U | G | C | U | E | G | G | E | G | E | C | E |
| IRM 901 | E | E | E | E | - | U | E | E | C | E | E | E | E | E | E | E | E |
| ASTM #2 | E | E | E | E | - | U | E | G | U | E | G | E | E | E | E | E | E |
| IRM 903 | E | E | E | E | - | U | E | G | U | E | G | E | E | E | E | E | E |
| Automatic trans. fluid [2] | G | E | G | G | - | U | E | G | U | E | C | G | E | E | E | E | E |
| **Barium chloride, 10% aq** | E | E | C | C | - | E | E | E | E | E | G | C | U | G | G | G | G |
| Barium hydroxide, 105 aq | E | E | G | C | - | E | E | E | E | E | E | G | G | U | G | U | G |
| Barium sulfide, 10% aq | E | E | C | C | - | E | E | E | E | E | G | C | C | U | G | U | U |
| Benzene, benzol | U | E | U | U | - | U | U | U | U | E | U | C | G | E | E | G | E |
| Benzoic acid | U | E | C | U | - | U | U | U | E | E | C | C | U | G | G | G | G |
| Benzyl alcohol | U | E | C | U | - | E | U | G | G | E | C | C | E | G | E | G | G |
| Biodiesel (<180˚F) | G | E | G | C | - | U | | | | | | | | | | | |
| Biodiesel (>180˚F) | C | E | U | U | - | U | | | | | | | | | | | |
| Black sulfate liquor | G | E | C | C | - | E | C | C | C | E | U | C | E | C | E | U | U |
| Blast furnace gas | C | U | C | G | - | U | U | U | U | E | U | C | E | C | E | U | U |
| Borax, 10% aq | E | E | G | C | - | E | G | G | E | E | G | E | E | E | E | G | - |
| Boric acid, 10% aq | E | E | C | E | - | E | G | G | G | E | G | G | U | G | C | C | C |
| Brine | G | E | C | C | - | C | E | G | E | E | G | C | U | G | G | U | E |
| Bromine, dry | U | E | U | U | - | U | U | U | U | E | U | U | U | C | U | C | C |
| Butane[1] | LPG approved hose only | | | | - | E | C | U | E | - | - | E | E | E | E | E | |
| Butyl acetate | U | E | U | U | - | E | U | U | G | U | U | C | E | E | E | E | E |
| Butyl alcohol | E | E | G | G | - | C | E | E | G | E | G | G | G | G | G | G | G |



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## Fluid compatibility

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Note 1 - Rubber-covered hose must be perforated to allow gas to escape.
Note 2 - Due to the widely different additives in these fluids, testing should be done on the actual fluid being considered.

| **E**=Excellent<br>**G**=Good<br>**C**=Conditional<br>**U**=Unsatisfactory | Synthetic rubber | PTFE | Thermoplastic elastomer | CPE | Special application hose | EPDM | Buna-N | Neoprene | EPR | Viton* | Urethane | Hytrel† | Steel | Brass | Stainless steel | Aluminum | Monel‡ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | | | | | | |
| **Fluid** | **Hose** | | | | | | **Seals** | | | | | | **Metal** | | | | |
| Butyl cellosolve | U | E | U | U | - | E | U | U | G | U | U | C | E | E | E | E | E |
| Butylene (butene)[1] | C | E | - | C | - | U | C | U | U | E | U | - | E | E | E | E | E |
| Butyl stearate | U | E | - | U | - | U | G | U | U | E | - | - | G | G | G | G | G |
| Butyraldehyde | U | E | - | U | - | E | U | U | G | U | U | - | E | E | E | E | G |
| **Calcium acetate, 10% aq** | G | E | C | C | - | E | G | G | E | U | U | C | G | G | G | C | G |
| Calcium bisulfate, 10% aq | U | E | C | G | - | U | E | E | U | E | G | G | U | C | C | U | U |
| Calcium chloride, 10% aq | E | E | E | C | - | E | E | E | E | E | E | E | G | G | G | C | G |
| Calcium hydroxide, 10% aq | E | E | C | C | - | E | E | E | E | E | U | C | G | G | G | U | G |
| Calcium hydroxide, 10% aq | C | E | C | U | - | E | U | U | E | E | U | C | U | G | C | U | U |
| Calcium nitrate, 10% aq | E | E | E | G | - | E | E | E | E | E | E | E | G | G | G | G | G |
| Carbitol | G | E | G | C | - | G | G | G | G | G | U | G | E | E | E | E | E |
| Carbolic acid (phenol) | U | E | U | U | - | C | U | U | G | E | U | U | U | E | E | - | - |
| Carbonic acid | C | E | C | U | - | E | G | E | E | E | C | C | U | C | E | G | E |
| Carbon dioxide, dry gas[1] | E | E | E | E | - | E | G | G | E | E | G | E | E | E | E | E | E |
| Carbon disulfide | U | E | U | U | - | U | U | U | U | E | C | C | G | G | G | E | G |
| Carbon monoxide[1] | E | E | E | E | - | E | G | G | E | E | G | E | E | E | E | E | E |
| Carbon tetrachloride | U | E | U | U | - | U | U | U | U | E | U | U | U | G | G | U | E |
| Castor oil | E | E | G | E | - | G | E | E | G | E | G | G | E | E | E | E | E |
| Cellosolve acetate | U | E | U | U | - | E | U | U | G | U | U | U | U | U | E | G | E |
| China wood oil (tung Oil) | E | E | C | C | - | U | G | G | U | E | U | C | E | G | E | E | E |
| Chlorine[1] | U | G | U | U | - | U | U | U | U | G | U | U | C | C | C | C | C |
| Chloroacetic acid | U | E | U | U | - | E | U | U | G | U | U | U | U | U | U | U | G |

| **E**=Excellent<br>**G**=Good<br>**C**=Conditional<br>**U**=Unsatisfactory | Synthetic rubber | PTFE | Thermoplastic elastomer | CPE | Special application hose | EPDM | Buna-N | Neoprene | EPR | Viton* | Urethane | Hytrel† | Steel | Brass | Stainless steel | Aluminum | Monel‡ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | | | | | | |
| **Fluid** | **Hose** | | | | | | **Seals** | | | | | | **Metal** | | | | |
| Chloroacetone | U | E | U | U | - | E | U | U | E | U | U | U | G | G | G | U | G |
| Chlorobenzene | U | E | U | U | - | U | U | U | U | G | U | U | G | G | G | G | G |
| Chloroform | U | E | U | U | - | U | U | U | U | E | U | U | G | G | G | G | G |
| O-Chlorophenol | U | E | U | U | - | U | U | U | U | E | U | U | G | G | G | U | G |
| Chlosulfonic acid | U | U | U | U | - | U | U | U | U | U | U | U | G | U | G | G | C |
| Chrome plating solution | U | E | - | U | - | U | U | U | G | E | U | - | C | U | U | U | U |
| **Chromic acid** | U | E | - | U | - | C | U | U | C | E | U | - | C | U | U | U | U |
| Citric acid | G | E | C | G | - | E | E | E | E | E | E | C | C | C | C | C | C |
| Coke oven gas | U | E | - | U | - | U | U | U | U | E | U | - | E | C | E | U | U |
| Copper chloride, 10% aq | E | E | E | G | - | E | E | E | E | E | G | E | U | U | U | U | U |
| Copper cyanide, 10% aq | E | E | - | G | - | E | E | E | E | E | E | - | E | U | G | U | G |
| Copper sulfate, 10% aq | E | E | G | G | - | E | E | E | E | E | G | G | U | C | G | U | G |
| Cotton seed Oil | E | E | E | G | - | C | E | G | C | E | E | E | E | E | E | E | E |
| Creosote (coal tar) | G | E | U | G | - | U | G | C | U | E | U | U | E | C | E | E | E |
| Crude oil | G | E | C | E | - | U | E | G | U | E | G | C | G | U | G | U | U |
| Cyclohexanol | C | E | C | G | - | U | E | G | U | E | C | C | E | E | E | C | E |
| Cyclohexanone | U | E | C | U | - | G | U | U | G | U | G | G | E | E | E | C | E |
| **Detergent/ Water solution** | E | E | C | G | - | E | E | E | E | E | C | C | G | E | E | E | E |
| Diacetone alchohol (acetol) | U | E | U | U | - | E | U | U | E | U | C | C | E | E | E | E | E |
| Dibenzyl ether | U | E | - | U | - | G | U | U | G | U | - | - | G | G | G | G | G |
| Diesel oil [2] | G | E | C | G | - | U | E | C | U | E | C | C | E | E | E | E | E |
| Diethylamine | C | E | - | C | - | C | G | G | G | U | - | - | E | U | E | - | E |
| Dioctyl phthalate (DOP) | U | E | C | C | - | G | U | U | G | G | C | C | E | E | E | E | E |
| Dowtherm A&E | U | E | - | U | - | U | U | U | U | E | - | - | G | U | E | E | E |
| **Ethyl alcohol (Ethanol)** | E | E | C | G | - | E | E | E | E | E | C | C | E | E | E | G | E |
| Ethyl acetate | U | E | C | U | - | G | U | U | G | U | C | C | E | E | E | E | E |
| Ethyl benzene | U | E | - | U | - | U | U | U | U | E | U | - | E | G | G | G | E |
| Ethyl cellulose | G | E | U | U | - | G | G | G | G | U | C | C | E | G | G | G | G |
| Ethyl chloride | C | E | U | U | - | U | U | U | U | E | U | U | E | E | E | G | G |
| Ethylene dichloride | U | E | U | U | - | U | U | U | U | G | U | U | G | C | G | G | G |
| Ethylene glycol | E | E | C | G | - | E | E | E | E | E | C | C | U | G | E | E | E |

**Resistance key rating**

**E** = Excellent – Fluid has little or no effect.

**G** = Good – Fluid has minor to moderate effect.

**C** = Conditional – Service conditions should be described to Danfoss Aeroquip for determination of suitability for application.

**U** = Unsatisfactory



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# Fluid compatibility

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Note 1 - Rubber-covered hose must be perforated to allow gas to escape.
Note 2 - Due to the widely different additives in these fluids, testing should be done on the actual fluid being considered.

**E**=Excellent
**G**=Good
**C**=Conditional
**U**=Unsatisfactory

| Fluid | Hose: Synthetic rubber 1 | PTFE 2 | Thermoplastic elastomer 3 | CPE 4 | Special application hose 5 | EPDM 6 | Seals: Buna-N | Neoprene | EPR | Viton* | Urethane | Hytrel† | Metal: Steel | Brass | Stainless steel | Aluminum | Monel‡ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ferric chloride, 10% aq** | E | E | - | G | - | E | E | G | E | E | - | - | U | U | U | U | U |
| Ferric nitrate, 10% aq | E | E | C | E | - | E | E | E | E | E | C | C | U | U | G | U | U |
| Ferric sulfate, 10% aq | E | E | C | E | - | E | G | G | G | E | C | C | U | U | E | U | U |
| Formaldehyde | U | E | C | U | - | E | C | C | G | G | C | C | E | E | E | G | G |
| Formic acid | G | E | U | C | - | E | C | G | E | U | U | U | U | C | C | C | C |
| Fuel oil | E | E | G | E | - | U | E | G | U | E | G | G | E | E | E | E | E |
| Furfural | U | E | - | U | - | G | C | C | G | U | U | - | G | G | G | G | G |
| **Gallic acid, solution** | G | E | - | C | - | G | G | G | G | E | U | - | U | - | G | C | G |
| Gasoline [2] | G | E | E | G | - | U | E | C | U | E | E | E | E | E | E | E | E |
| Gasohol [2] | G | E | G | C | - | U | G | G | U | E | E | E | E | E | E | G | E |
| Glycerine/ Glycerol | E | E | E | E | - | E | E | E | E | E | G | E | E | G | E | E | E |
| Green sulfate liquor | G | E | - | U | - | E | G | G | E | E | - | - | U | U | E | U | U |
| **Helium[1]** | E | G | C | E | - | E | E | E | E | E | E | E | E | E | E | E | E |
| Heptane | E | E | E | C | - | U | E | G | U | E | G | G | E | E | E | E | E |
| Hexaldehyde | U | E | - | U | - | E | U | G | G | U | U | - | G | G | E | E | G |
| Hexane | E | E | E | E | - | U | E | G | U | E | G | G | E | E | E | E | E |
| Hydraulic oils [2] | | | | | | | | | | | | | | | | | |
| Ester blend | C | E | C | G | - | C | E | U | U | E | U | E | E | E | E | E | E |
| Phos. Ester/ petroleum blend | U | E | C | U | - | U | U | U | U | C | U | G | E | E | E | E | E |
| Silicone oils | E | E | E | E | - | E | E | E | E | E | E | E | E | E | E | E | E |
| Straight petroleum base | E | E | E | E | - | U | E | G | U | E | E | E | E | E | E | E | E |
| Straight phosphate ester | U | E | C | U | - | E | U | U | G | C | U | G | E | E | E | E | E |
| Water glycol | E | E | C | G | - | E | E | E | E | E | C | C | E | E | E | G | E |
| Water petroleum emulsion | E | E | C | G | - | U | E | G | U | E | C | C | C | E | E | G | E |

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| Fluid | Hose: Synthetic rubber 1 | PTFE 2 | Thermoplastic elastomer 3 | CPE 4 | Special application hose 5 | EPDM 6 | Seals: Buna-N | Neoprene | EPR | Viton* | Urethane | Hytrel† | Metal: Steel | Brass | Stainless steel | Aluminum | Monel‡ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hydrobromic acid | U | E | U | E | - | G | U | U | E | E | U | U | E | U | E | E | U |
| Hydrochloric acid, cold | U | E | U | U | - | G | U | U | G | E | U | U | U | U | U | U | U |
| Hydrocyanic acid | C | E | - | U | - | E | C | C | E | E | - | - | E | E | G | E | G |
| Hydrofluoric acid | U | E | U | U | - | U | U | U | C | U | U | U | U | U | U | U | C |
| Hydrofluorosilic acid | E | E | - | G | - | G | G | G | E | E | - | - | U | U | U | U | U |
| Hydrogen[1] | G | C | G | G | - | E | E | E | E | E | E | E | E | E | E | E | E |
| Hydrogen peroxide | C | E | G | C | - | G | G | G | G | E | G | G | U | U | G | E | U |
| Hydrogen sulfide, dry | C | C | C | U | - | E | U | G | E | U | - | G | E | G | G | G | G |
| Isocyanate | U | E | U | U | - | U | U | U | G | E | U | U | G | - | G | - | - |
| Iso octane | G | E | E | G | - | U | E | G | U | E | G | E | E | E | E | E | E |
| Isopropyl acetate | U | E | C | U | - | C | U | U | G | U | U | C | E | - | E | E | E |
| Isopropyl alcohol | G | E | C | G | - | E | G | G | E | E | U | C | E | E | E | G | E |
| Isopropyl ether | G | E | - | C | - | U | G | U | U | U | C | - | G | G | G | - | - |
| **JP-4, JP-5** | E | E | G | E | - | U | E | U | U | E | U | G | E | E | E | E | E |
| **Kerosene** | G | E | G | E | - | U | E | U | U | E | U | G | E | E | E | E | E |
| **Lacquer/ lacquer solvents** | U | E | U | U | - | E | U | U | U | U | U | G | U | E | E | E | E |
| Lime sulfur | U | E | C | U | - | E | U | E | E | E | C | C | G | U | G | - | U |
| Linseed oil | E | E | G | G | - | U | E | G | U | E | G | G | E | E | E | E | E |
| LPG[1] | LPG approved hose only | | | | | | E | G | U | E | - | - | E | E | E | E | E |
| Lubricating oils[2] | See hydraulic oils | | | | | | See hydraulic oils | | | | | | See hydraulic oils | | | | |
| **Magnesium chloride, 10%aq** | E | E | C | E | - | E | E | E | E | E | C | C | E | C | C | G | G |
| Magnesium hydroxide, 10% aq | G | E | C | G | - | E | G | G | E | E | C | C | E | G | E | G | G |
| Magnesium sulfate, 10% aq | E | E | C | E | - | E | E | E | E | E | C | C | E | E | E | E | E |
| Maleic acid | U | E | C | C | - | G | U | U | U | E | C | C | E | G | G | G | G |
| Maleic anhydride | U | E | C | U | - | C | U | U | U | E | C | C | G | U | E | G | E |
| Malic acid | G | E | - | G | - | U | G | G | U | G | - | - | U | - | E | G | E |
| Mercuric chloride | G | E | E | G | - | G | E | E | E | E | E | E | U | U | U | U | U |
| Mercury | E | E | E | E | - | E | E | E | E | E | E | E | E | U | E | U | G |
| Methanol | E | E | C | E | - | E | G | G | E | U | C | C | G | G | E | C | E |

## Resistance key rating

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Note 1 - Rubber-covered hose must be perforated to allow gas to escape.
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**E**=Excellent
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| Fluid | Hose | | | | | | Seals | | | | | | Metal | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Synthetic rubber 1 | PTFE 2 | Thermoplastic elastomer 3 | CPE 4 | Special application hose 5 | EPDM 6 | Buna-N | Neoprene | EPR | Viton* | Urethane | Hytrel† | Steel | Brass | Stainless steel | Aluminum | Monel‡ |
| Methyl bromide | C | E | U | U | - | U | G | U | U | E | U | U | E | E | G | U | E |
| Methyl chloride | U | E | U | U | - | U | U | U | U | E | U | U | E | E | E | U | G |
| Methyl butyl ketone | U | E | U | U | _ | E | U | U | E | U | C | C | E | E | E | - | E |
| Methyl ethyl ketone | U | E | U | U | _ | E | U | U | E | U | U | G | G | G | G | G | G |
| Methylene chloride | U | E | U | U | _ | U | U | U | U | G | U | U | G | G | G | G | G |
| Methyl isobutyl ketone | U | E | U | U | _ | E | U | U | U | U | U | U | G | G | G | G | G |
| Methyl isopropyl ketone | U | E | U | C | - | E | U | U | U | U | U | U | G | G | G | G | G |
| Methyl salicylate | U | E | - | U | - | C | U | U | C | U | - | - | E | G | G | E | G |
| MIL-L-2104 | E | E | E | E | - | U | E | G | U | E | E | E | E | E | E | - | E |
| MIL-H-5606 | E | E | E | E | - | U | E | G | U | E | E | E | E | E | E | E | E |
| MIL-H-6083 | E | E | E | E | - | U | E | E | U | E | E | E | E | E | E | - | E |
| MIL-L-7808 | G | E | G | G | - | U | G | U | U | E | G | G | G | G | E | - | - |
| MIL-L-23699 | E | E | - | G | - | U | G | U | U | E | - | - | E | E | E | E | E |
| MIL-H-46170 | G | E | - | G | - | C | E | G | U | E | - | - | E | E | E | - | E |
| MIL-H-83282 | G | E | - | G | - | U | E | U | U | E | - | - | E | E | E | - | E |
| Mineral oils | E | E | G | E | - | U | E | G | U | E | G | G | E | E | E | E | E |
| **Naphtha** | C | E | G | E | - | U | C | U | U | E | C | G | - | - | - | - | - |
| Naphthalene | U | E | U | U | - | U | U | U | U | E | C | G | E | G | E | G | G |
| Naphthenic acid | U | E | - | U | - | U | C | U | U | E | - | - | - | G | E | G | G |
| Natural gas[1] | LPG approved hose only | | | | | | E | E | U | E | - | - | G | G | G | G | G |
| Nickel acetate, 10% aq | G | C | U | G | - | E | C | C | E | G | U | U | G | C | E | G | E |
| Nickel chloride, 10% aq | E | E | U | E | - | E | E | G | E | E | U | U | U | U | G | U | G |
| Nickel sulfate, 10% aq | E | E | U | E | - | E | E | E | E | E | U | U | U | G | G | U | G |
| Nitric acid, to 10% | U | E | U | U | - | G | U | U | U | E | U | C | U | U | E | U | U |
| Nitric acid, over 10% | U | C | U | U | - | U | U | U | U | G | U | U | U | U | E | C | U |
| Nitrobenzene | U | E | U | U | - | E | U | U | U | G | U | U | E | G | E | E | E |

| Fluid | Hose | | | | | | Seals | | | | | | Metal | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Synthetic rubber 1 | PTFE 2 | Thermoplastic elastomer 3 | CPE 4 | Special application hose 5 | EPDM 6 | Buna-N | Neoprene | EPR | Viton* | Urethane | Hytrel† | Steel | Brass | Stainless steel | Aluminum | Monel‡ |
| Nitrogen[1] | E | E | E | E | - | E | E | E | E | E | E | E | E | E | E | E | E |
| Octyl alcohol | C | E | E | U | - | U | E | E | E | E | E | E | E | E | E | E | E |
| Oleic acid | G | E | G | U | - | U | U | U | C | G | G | E | C | E | G | C | G |
| Ortho-dichlorobenzene | U | E | - | U | - | U | U | U | U | E | - | - | G | G | G | G | G |
| Oxalic acid, 10% aq | C | E | C | C | - | E | G | G | E | E | C | C | U | C | C | C | C |
| Oxygen[1] | U | U | U | U | - | E | - | - | - | - | - | - | G | G | G | G | G |
| **Palmitic acid** | E | E | E | E | - | G | E | G | G | E | - | E | G | - | E | G | G |
| Para-dichlorobenzene | U | E | - | U | - | U | U | U | U | E | - | - | G | G | G | G | G |
| Pentane[1] | Lpg approved hose only | | | | | | E | E | U | E | U | G | G | G | G | E | G |
| Perchloric acid | U | E | U | U | - | G | E | G | G | E | U | U | U | U | U | U | U |
| Per-chloroethylene | U | E | U | U | - | U | U | U | U | E | U | U | C | G | G | G | E |
| Petroleum base oils | G | E | E | E | - | U | E | G | U | E | E | E | E | E | E | E | E |
| Phenol (carbolic acid) | U | E | U | U | - | U | U | U | G | E | U | U | U | E | E | E | G |
| Phosphate ester[2] | U | E | C | U | - | E | U | U | G | C | U | G | E | E | E | E | E |
| Phosphoric acid 20% | U | E | U | U | - | E | U | U | G | E | U | U | U | E | U | C | E |
| Phosphorous trichloride | U | E | U | U | - | E | U | U | E | E | U | U | C | U | C | E | E |
| Potassium Acetate, 10% aq | G | E | - | G | - | E | G | G | E | U | - | - | C | G | C | U | G |
| Potassium chloride, 10% aq | E | E | E | E | - | E | E | E | E | E | E | E | E | C | E | U | G |
| Potassium cyanide, 10% aq | E | E | E | G | - | E | E | E | E | E | E | E | C | U | G | U | C |
| Potassium dichromate, 10% aq | E | E | E | E | - | E | E | E | E | E | E | E | C | C | C | C | C |
| Potassium hydroxide, to 10% | G | E | C | C | - | E | G | G | E | G | C | C | G | G | G | U | E |
| Potassium hydroxide, over 10% | C | E | U | C | - | E | C | C | E | U | U | U | G | G | G | U | E |
| Potassium nitrate, 10% aq | E | E | E | E | - | E | E | E | E | E | E | E | G | G | E | G | - |
| Potassium sulfate, 10% aq | E | E | E | E | - | E | E | E | E | E | E | E | - | - | - | - | - |
| Propane[1] (liquified) | LPG approved hose only | | | | | | C | - | - | - | - | - | E | E | E | E | E |

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# Fluid compatibility

| E=Excellent<br>G=Good<br>C=Conditional<br>U=Unsatisfactory | Synthetic rubber | PTFE | Thermoplastic elastomer | CPE | Special application hose | EPDM | Buna-N | Neoprene | EPR | Viton* | Urethane | Hytrel† | Steel | Brass | Stainless steel | Aluminum | Monel‡ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | | | | | | |
| **Fluid** | **Hose** | | | | | | **Seals** | | | | | | **Metal** | | | | |
| Propyl acetate | U | E | - | U | - | G | U | U | G | U | - | - | E | - | E | E | E |
| Propyl alcohol | E | E | U | E | - | E | E | E | E | E | U | U | E | E | E | E | E |
| Propylene[1] | U | E | - | U | - | U | U | U | U | E | - | - | E | E | E | E | E |
| **Refrigerant R-121** | E | - | G | C | - | C | G | E | C | E | E | E | E | E | E | E | E |
| Refrigerant R-131 | E | - | G | C | - | G | G | E | C | E | E | E | E | E | E | E | E |
| Refrigerant R-221 | U | C | U | U | - | E | U | E | C | U | U | U | E | E | E | E | E |
| Refrigerant R-134a1 | C | C | U | U | - | E | E | C | U | U | U | E | E | E | E | E | E |
| **Sewage** | G | E | E | G | - | E | E | E | E | E | U | E | G | G | G | G | G |
| Silicone oils | G | E | E | G | - | E | E | E | E | E | E | E | E | E | E | E | E |
| Soap (water solutions) | E | E | C | E | - | E | E | E | E | E | C | C | E | E | E | U | E |
| Sodium acetate, 10% aq | G | U | - | G | - | E | G | G | E | U | - | - | E | E | G | E | E |
| Sodium Bicarbonate, 10% aq | E | E | E | E | - | E | E | E | E | E | E | E | G | G | E | G | E |
| Sodium borate, 10% aq | E | E | E | E | - | E | E | E | E | E | E | E | E | E | E | G | - |
| Sodium carbonate, 10% aq | E | E | E | E | - | E | E | E | E | E | E | E | E | G | E | U | E |
| Sodium chloride, 10% aq | E | E | E | G | - | E | E | E | E | E | E | E | U | C | C | C | E |
| Sodium cyanide, 10% aq | E | E | E | E | - | E | E | E | E | E | E | E | E | - | C | U | U |
| Sodium hydroxide, to 10% | C | E | G | C | - | E | U | G | E | E | G | G | C | G | C | U | C |
| Sodium hydroxide, over 10% | U | E | C | U | - | E | U | U | G | E | C | C | C | C | C | U | C |
| Sodium hypochlorite, 10% aq | C | E | C | G | - | G | C | C | E | C | C | C | U | U | U | U | C |
| Sodium metaphosphate, 10% aq | E | E | E | E | - | E | E | E | E | E | E | E | E | G | G | U | G |

| E=Excellent<br>G=Good<br>C=Conditional<br>U=Unsatisfactory | Synthetic rubber | PTFE | Thermoplastic elastomer | CPE | Special application hose | EPDM | Buna-N | Neoprene | EPR | Viton* | Urethane | Hytrel† | Steel | Brass | Stainless steel | Aluminum | Monel‡ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | | | | | | |
| **Fluid** | **Hose** | | | | | | **Seals** | | | | | | **Metal** | | | | |
| Sodium nitrate, 10% aq | G | E | E | G | - | E | G | G | E | - | E | E | E | C | E | E | E |
| Sodium perborate, 10% aq | G | E | - | G | - | E | G | G | E | E | - | - | C | U | C | U | C |
| Sodium peroxide, 10% aq | G | E | - | G | - | G | G | G | E | E | U | - | U | U | C | C | C |
| Sodium phosphates, 10% aq | E | E | E | C | - | E | E | E | E | E | E | E | U | E | G | U | E |
| Sodium silicate, 10% aq | E | E | E | G | - | E | E | E | E | E | E | E | E | E | E | E | E |
| Sodium sulfate, 10% aq | E | E | E | G | - | E | E | E | E | E | E | E | C | G | G | G | G |
| Sodium sulfide, 10% aq | E | E | E | G | - | E | E | E | E | E | E | E | C | U | C | U | G |
| Sodium thiosulfate, 10% aq | G | E | E | G | - | E | G | E | E | E | E | E | U | U | C | G | E |
| Soy bean oil | E | E | G | C | - | U | E | G | U | E | G | G | E | E | E | E | E |
| Stannic chloride | G | E | C | G | - | E | E | G | E | E | C | C | U | U | U | U | U |
| Steam[1] (up to 388°F) | U | E | U | U | - | G | U | U | C | C | U | U | E | E | E | G | E |
| Stearic acid | G | E | G | G | - | G | G | G | G | E | G | G | C | C | E | C | E |
| Stoddard solvent | G | E | U | C | - | U | E | G | U | E | U | U | E | E | E | E | E |
| Styrene | U | E | U | U | - | U | U | U | U | G | U | U | E | E | E | E | E |
| Sulfur, slurry | C | E | G | E | - | E | U | E | E | E | G | G | E | U | G | E | E |
| Sulfur chloride, wet | U | E | - | U | - | U | U | U | U | E | - | - | G | - | G | G | U |
| Sulfur dioxide, dry[1] | U | E | U | U | - | E | U | U | G | E | U | U | E | G | G | E | G |
| Sulfuric acid, to 10% | U | E | U | U | - | E | U | G | U | E | C | C | U | G | C | - | E |
| Sulfuric acid, over 10% | U | E | U | U | - | U | U | U | U | G | U | U | C | C | C | U | C |
| Sulfurous acid | U | E | U | G | - | G | C | C | U | G | U | U | U | C | C | C | U |
| **Tannic acid** | G | E | G | G | - | E | G | E | E | E | G | G | E | E | E | C | E |
| Tar (Bituminous) | G | E | G | G | - | U | G | U | U | E | G | G | E | G | E | E | E |
| Tartaric acid | E | E | G | E | - | G | E | G | G | E | G | G | U | C | C | E | E |
| Tertiary butyl alcohol | G | E | G | E | - | G | G | G | G | E | G | G | G | G | G | G | G |
| Titanium tetrachloride | U | E | - | U | - | U | C | U | U | E | - | - | E | U | G | U | |
| Toluene (toluol) | U | E | U | U | - | U | U | U | U | E | U | U | E | E | E | E | E |

## Resistance key rating

**E** = Excellent – Fluid has little or no effect.
**G** = Good – Fluid has minor to moderate effect.
**C** = Conditional – Service conditions should be described to Danfoss Aeroquip for determination of suitability for application.
**U** = Unsatisfactory



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# Hydraulic fluids & lubricating oils

The following charts are a representative list of fluids and manufacturers. The fluids are grouped under generic "family" heads and arranged alphabetically. For each generic "family" listing we have included maximum fluid temperature recommendations for the six hose classifications on page 344 (1 through 6). Two maximum fluid temperature ratings are listed under designations of "H" and "LP". The "H" designation is for hydraulic service up to the maximum rated operating pressure of any particular hose in the classification. The "LP" designation is for low-pressure service such as lubricating oil systems or low-pressure hydraulic return lines. The letter "U" in the box indicates unsatisfactory resistance to the fluid type. Fluid temperature ratings are predicated on maximum allowable ambient temperatures as follows:

**Classifications 1 and 3**

(Synthetic rubber and thermoplastic elastomer)

"H" fluid temp. ratings: +140°F ambient

"LP" fluid temp. ratings: +180°F ambient

**Classification 2 (PTFE)**

"H" fluid temp. ratings: +400°F ambient

"LP" fluid temp. ratings: +400°F ambient

**Classification 4 (CPE)**

"H" fluid temp. ratings: +160°F ambient

"LP" fluid temp. ratings: +250°F ambient

(If "H" fluid temperature is +225°F or less, allowable ambient temperature may be increased to +200°F)

**Ambient temperatures in excess of those recommended, in conjunction with maximum fluid temperatures, can materially shorten the service life of the hose.**

**E**=Excellent
**G**=Good
**C**=Conditional
**U** =Unsatisfactory

| Fluid | Hose | | | | | | Seals | | | | | | Metal | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Synthetic rubber 1 | PTFE 2 | Thermoplastic elastomer 3 | CPE 4 | Special application hose 5 | EPDM 6 | Buna-N | Neoprene | EPR | Viton* | Urethane | Hytrel† | Steel | Brass | Stainless steel | Aluminum | Monel‡ |
| Trichlorethylene | U | E | U | U | - | U | U | U | U | E | U | U | E | G | E | E | E |
| Tricresyl Phosphate | U | E | U | U | - | E | U | U | E | G | U | U | E | - | C | - | G |
| Triethanolamine | G | E | U | G | - | E | E | U | E | U | U | U | E | U | E | E | E |
| Tung Oil | E | E | C | C | - | U | G | G | U | E | U | C | E | G | E | E | E |
| Turpentine | E | E | G | G | - | U | G | U | U | E | G | G | G | G | G | G | G |
| Varnish | C | E | G | G | - | U | G | U | U | E | G | G | E | G | E | E | E |
| Vinyl Chloride | U | E | U | U | - | U | U | U | U | E | U | U | E | U | C | E | E |
| Water (to +150°F) | E | E | E | G | - | E | E | E | E | E | E | E | C | G | E | G | E |
| Water (+151°F to +200°F) | C | E | U | C | - | E | E | E | E | E | U | U | C | G | E | G | E |
| Water (+201°F to +350°F) | U | E | U | U | - | E | U | U | G | G | U | U | C | G | E | G | E |
| Water Glycol | E | E | C | E | - | E | E | E | E | E | C | C | E | E | E | G | E |
| Water Petroleum Emulsion[2] | E | E | C | C | - | U | E | G | U | E | C | C | C | E | E | G | E |
| Xylene | U | E | C | U | - | U | U | U | U | E | U | C | E | E | E | E | E |
| Zinc Chloride, 10% aq | E | E | E | E | - | E | E | E | E | E | E | E | E | U | U | C | G |
| Zinc Sulfate, 10% aq | E | E | - | E | - | E | E | E | E | E | - | - | U | C | G | C | G |

**Resistance key rating**

**E** = Excellent – Fluid has little or no effect.

**G** = Good – Fluid has minor to moderate effect.

**C** = Conditional – Service conditions should be described to Danfoss Aeroquip for determination of suitability for application.

**U** = Unsatisfactory

This chart is intended for reference use only.

The information in this chart pertains strictly to material compatibility and is not intended to be used as an application guide. For information on specific applications not included in this catalog, please contact Danfoss Aeroquip

*Viton is a trademark of The Chemours Company FC, LLC.

†Hytrel is a registered trademark of E.I. du Pont.

‡Monel is a registered trademark of Special Metals Corporation group of Companies.

Note 1 - Rubber-covered hose must be perforated to allow gas to escape.

Note 2 - Due to the widely different additives in these fluids, testing should be done on the actual fluid being considered.

**Caution:** The fluid manufacturer's recommended maximum operating temperature for any specific name brand fluid should be scrupulously observed by the user. These recommended temperatures can vary widely between name brands of different fluid compositions, even though they fall into the same generic "family" of fluids. Exceeding the manufacturer's recommended maximum temperature can result in fluid breakdown, producing by-products that are harmful to elastomeric products, as well as other materials in the system. If a manufacturer's recommended maximum temperature for his specific fluid is lower than that for the hose rating, it should take precedence over the hose rating for service usage.

# Hydraulic fluids & lubricating oils (continued)

## Straight petroleum-base

**Maximum fluid temperature recommendation.**

See caution on page 350 for maximum fluid temperatures and limiting ambient temperatures.

| Hose classifications (see page 350) | | | | |
|---|---|---|---|---|
| **Fluid name** | **1** | **2** | **3** | **4** |
| **H** | +200˚F | +400˚F | +200˚F | +300˚F |
| **LP** | +200˚F | +450˚F | +200˚F | +300˚F |

Aircraft hydraulic oil AA
Ambrex oils
Arco A.T.F. Dexron
Arco A.T.F. dDexron IV
Arco A.T.F. Ype F
Arco fleet motor
Arco H.T.F. C-2 fluid
Arco H.T.C. 100 fluid
Arco 303 fluid
ATF special
Automatic transmission fluid (Dexron)

Carnea oils
Citgo amplex
Citgo ATF, type F
Citgo ATF, Dexron
Citgo extra duty circulating oils mineral oil (Heavy duty)(R & O)
Citgo motor oils
Citgo pacemaker series mineral oil (R & O)
Citgo pacemaker t series mineral oil (R & O)
Citgo pacemaker XD series mineral oil (Heavy duty) (R & O)
Citgo sentry
Citgo tractor hydraulic fluid
Conoco 303 fluid
Custom motor oil

Dectol R & O oils
Delo 400 motor oils
Delvac oils
Delvac SHC
Delvac special 10W-30
Donax T oils

DTE oils
Duro
Duro AW

EP hydraulic oils
EP industrial oils
EP machine oils
Energol HL68
Energol HLP C68
Etna oils
Exxon ATF

Factovis 52 – Conventional R & O hydraulic fluid

Gulf harmony AW
Gulf security AW
Glide

Hulburt 27 series
Hydraulic series
Hydraulic oils
Hydroil series

Industron 53 – anti wear hydraulic fluid

Lubrite motor 20W-40

Mobil AFT 210
Mobil AFT 220
Mobilfluid 62
Mobilfluid 423
Mobil hydraulic oils
Mobiloil special
Mobiloil super 10W-40

NUTO oils

OC turbine oils

Peaco oils
Pennbell oils
Power-tran fluid

Quadroil series

Rando oils
Rando oils HD
Redind oils
Regal oils R & O
Rimula oils
Rotella oils
Rotella T oils
RPM Delo 200 motor oils
RPM Delo 300 motor oils
RPM Delo special motor oils
Rubilene

Shell brand
Special motor oils
Sun R & O oils
Suntac HP oils
Suntac WR oils
Sunvis 700 oils
Sunvis 800 oils
Sunvis 900 oils
Super hydraulic oils
Supreme motor oils

Tellus oils
Teresstic oils
Torque fluids
Torque fluid 47
Torque fluid 56
Tractor hydraulic fluid

Union ATF Dexron
Union ATF type F
Union C-2 fluid
Union C-P oil
Union custom motor oil
Union gas engine oil
Union Guardol motor oil
Union heavy duty motor oil
Union hydraulic oil AW
Union hydraulic tractor fluid
Union premium motor oil
Union S-1 motor oil
Union special motor oil
Union super motor oil
Union torque correction fluid
Union turbine oil
Union turbine Oil XD
Union Unax
Union Unax AW
Union Unax R & O
Union Unax RX
Union Unitec motor oil
Univis J13
Univis J26
Univis P32

Vactra oils
Vitrea oils

Way lubricants

XD-3 motor oils



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# Hydraulic fluids & lubricating oils (continued)

## Water and petroleum oil emulsion (fr)

**Maximum fluid temperature recommendation.**

See caution on page 350 for maximum fluid temperatures and limiting ambient temperatures.

| Hose classifications (see page 350) | | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| H | +200˚F | +250˚F | +150˚F | +200˚F |
| LP | +200˚F | +250˚F | +150˚F | +200˚F |

**Fluid name**

Aqualube
Astrol #587

Chevron FR Fluid D
Chrysler L-705
Citgo pacemaker invert FR fluid
Conoco FR hydraulic fluid

Dasco IFR
Duro FR-HD

Fire resistant hydrafluid
Fire resistant hydraulic
Fluid B
FR 3110 hydraulic fluid (invert)
Fyre-safe W/O

Gulf R & D FR fluid

Houghto-safe 5046
Houghto-safe 5046W
Hulsafe 500
Hy-chock oil
Hydrasol A

Ironsides #814-A
Irus fluid 905

Kutwell 40

Masol fire resistant fluid
Meltran FR 900
Mine guard
Mobilmet S122

Penn drake hydraqua fluid
Permamul FR
Puro FR fluid
Pyrogard C
Pyrogard D

Quintolubric 957 series
Quintolubric 958 series

Regent hydrolube #670

Safoil hydraulic fluid anti-wear
Sinclair Duro FR-HD
Solvac 1535G
Staysol FR
Sunsafe F

Union FR fluid
Union soluble oil HD

Veedol auburn FRH
Veedol auburn FRH Concentrate

## Water and glycol solution

**Maximum fluid temperature recommendation.**

See caution on page 350 for maximum fluid temperatures and limiting ambient temperatures.

| Hose classifications (see page 350) | | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| H | +200˚F | +250˚F | +150˚F | C |
| LP | +200˚F | +250˚F | +150˚F | C |

**Fluid name**

Chem-trend HF-18
Chem-trend HF-20
Chevron glycol FR fluids
Citgo glycol FR fluids
Citgo glycol FR-20 XD
Citgo pacemaker

Dasco FR 150
Dasco FR 200
Dasco FR 200 B
Dasco FR 310

Fyrguard 150
Fyrguard 200
Fyre-Safe 225

Gulf FR fluid G-200
Gulf FR fluid – G series

Houghto-safe 271
Houghto-safe 416
Houghto-safe 520
Houghto-safe 525
Houghto-safe 616
Houghto-safe 620
Houghto-Safe 625
Houghto-safe 640
Hydra safe 620
Hydra safe 625
Hydraulic safety fluid 200
Hydraulic safety fluid 300
Hyspin AF-1
Hyspin AF-2
Hyspin AF-3

Maxmul
Maxmul FR
Melsyn 200
Melsyn glycol FR

Nyvac FR fluid
Nyvac FR 200 fluid
Nyvac 20 (WG)
Nyvac 30 (WG)

Park water glycol hydraulic fluid
Pennzoil fluid FR 2X

Quintolubric 700 series

Santosafe W/G 15
Santosafe W/G 20
Santosafe W/G 30
Standard glycol FR #15
Standard glycol FR #20
Standard glycol FR #25

Ucon hydrolube 150 CP
Ucon hydrolube 200 CP
Ucon hydrolube 275 CP
Ucon hydrolube 300 CP
Ucon hydrolube 550 CP
Ucon hydrolube 900 CP
Ucon hydrolube 150 DB
Ucon hydrolube 275 DB
Ucon hydrolube 150 LT
Ucon hydrolube 200 LT
Ucon hydrolube 275 LT
Ucon hydrolube 300 LT
Ucon M-1
Ucon hydrolube 200 NM
Ucon hydrolube 300 NM



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# Hydraulic fluids & lubricating oils (continued)

## Straight phosphate-ester (fr)

**Maximum fluid temperature recommendation.**

See caution on page 350 for maximum fluid temperatures and limiting ambient temperatures.

| Hose classifications (see page 350) | | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 6 |
| H | U | +400˚F | +200˚F | U | 200 |
| LP | U | +400˚F | +200˚F | U | 200 |

**Fluid name**

FR Fluids
Fyrquel 90
Fyrquel 150
Fyrquel 220
Fyrquel 300
Fyrquel 550
Fyrquel 1000
Fyrquel 150 R & O
Fyrquel 220 R & O
Fyrquel 550 R & O

Gulf FR Fluid P-37
Gulf FR Fluid P-40
Gulf FR Fluid P-43
Gulf FR Fluid P-45
Gulf FR Fluid P-47

Houghto-Safe 1010
Houghto-Safe 1055
Houghto-Safe 1115
Houghto-Safe 1120
Houghto-Safe 1130

Pyrogard 51
Pyrogard 53
Pyrogard 55

Safetytex 215
Skydraul 500A
Skydraul 7000

Univis P12

## Ester blend turbine oils

**Maximum fluid temperature recommendation.**

See caution on page 350 for maximum fluid temperatures and limiting ambient temperatures.

| Hose classifications (see page 350) | | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| H | - | - | - | - |
| LP | +250˚F | +450˚F | +200˚F | +300˚F |

**Fluid name**

Stauffer Jet I
Stauffer Jet II

## Silicone oils

Maximum fluid temperature recommendation.

See caution on page 350 for maximum fluid temperatures and limiting ambient temperatures.

| Hose classifications (see page 350) | | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| H | +200˚F | +400˚F | +200˚F | +300˚F |
| LP | +250˚F | +400˚F | +200˚F | +300˚F |

**Fluid name**

Dow Corning 200 Fluid (100CS)
Dow Corning QF1-2023
Dow Corning 4-3600
Dow Corning 3-3672

## Polyol-ester

Maximum fluid temperature recommendation.

See caution on page 350 for maximum fluid temperatures and limiting ambient temperatures.

| Hose classifications (see page 350) | | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| H | +150˚F | +400˚F | - | +150˚F |
| LP | +200˚F | +400˚F | - | +250˚F |

**Fluid name**

Quintolubric 822 Series

## Lubricant compatibility chart

| | Hose style | | |
|---|---|---|---|
| **Lubricant** | **GH001** | **FC800** | **FC802** |
| Mineral oil | Y | * | Y |
| PAG | Y | Y | Y |
| Ester oil | Y | Y | Y |
| Alkylbenzene | * | * | Y |

Y = Compatible N = Non-compatible.
* Contact product support for application review.



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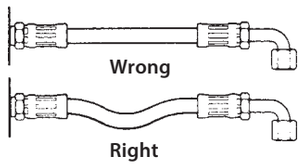
# Hose routing and installation

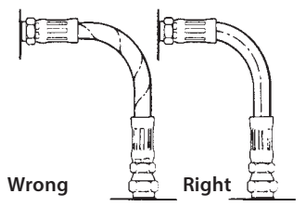
### 1. Provide for length change.

In straight hose installations, allow enough slack in the hose line to provide for changes in length that will occur when pressure is applied. This change in length can be from +2% to -4%.



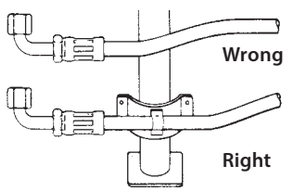

### 2. Avoid twisting and orient properly.

Do not twist hose during installation. This can be determined by the printed layline on the hose. Pressure applied to a twisted hose can cause hose failure or loosening of connections.



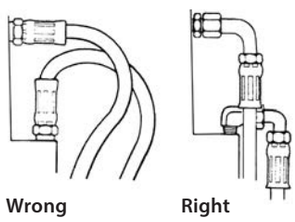

### 3. Protect from hazardous environment.

Keep hose away from hot parts. High ambient temperature will shorten hose life. If you can not route it away from the heat source, insulate it. (See Spring Guards page 250)



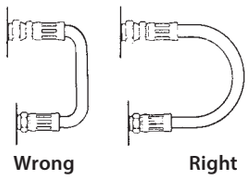

### 4. Avoid mechanical strain.

Use elbows and adapters in the installation to relieve strain on the assembly and to provide easier and neater installations that are accessible for inspection and maintenance.



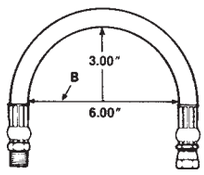

### 5. Use proper bend radius.

Keep the bend radius of the hose as large as possible to avoid collapsing of the hose and restriction of flow. Follow catalog specs on minimum bend radii.



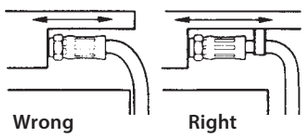

### 6. Use proper bend radius (cont'd).

Minimum bend radius is measured on the inside bend of the hose. To determine minimum bend, divide the total distance between ends (B length) by 2. For example, B=6, minimum bend radius=3.



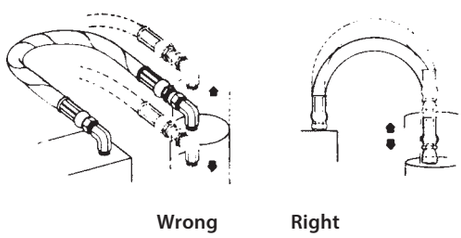

### 7. Secure for protection.

Install hose runs to avoid rubbing or abrasion. Use Aeroquip Hose Clamps to support long runs of hose or to keep hose away from moving parts. It is important that the clamps not allow the hose to move. This movement will cause abrasion and premature hose failure. (See Hose Clamps page 253)




### 8. Avoid improper hose movement.

Make sure relative motion of the machine components produces bending rather than twisting of the hose. Hose should be routed so that the flex is in the same plane as the equipment movement.




⚠

Refer to safety information regarding hose installation on page 336.



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# Analyzing failures

Everyone in maintenance encounters hose failures. Normally, there is no problem. The hose is replaced and the equipment goes back in operation. Occasionally the failures come too frequently – the same equipment with the same problems keep popping up. At this point the task is to determine and correct the cause of these repeated failures.

### Improper application

Beginning with the most obvious, the most common cause of hose failures – Improper application – compare the hose specifications with the requirements of the application.

Pay particular attention to the following areas:

- The maximum operating pressure of the hose.
- The recommended temperature range of the hose.
- Whether the hose is rated for vacuum service.
- The fluid compatibility of the hose.

Check all of these areas against the requirements of the application. If they don't match up, you need to select another hose. It's a good idea at this point to call on your local hose distributor for assistance in selecting the proper hose. Danfoss' distributors, for example, are well equipped to perform this service for you.

Distributor personnel attend special training courses in hydraulics and hose application conducted by the company. Or, if your problem is particularly difficult, the distributor can call on the services of Danfoss' field engineering staff. The company will send in a hose and hydraulic specialist to study the problem and come up with a solution.

### Improper assembly and installation

The second major cause of premature hose failure is improper assembly and installation procedures. This can involve anything from using the wrong fitting on a hose, to poor routing of the hose.

Danfoss provides excellent training material that you can use to combat this problem. A little time spent in training your maintenance people could pay big dividends in reduced downtime.

Contact Danfoss to register for a training session today.

### External damage

External damage can range from abrasion and corrosion, to hose that is crushed by a lift truck. These are problems that can normally be solved simply once the cause is identified. The hose can be re-routed or clamped, or a fire sleeve or abrasion guard can be used.

In the case of corrosion, the answer may be as simple as changing to a hose with a more corrosion resistant cover or re-routing the hose to avoid the corrosive element.

### Faulty equipment

Too frequent or premature hose failure can be the symptom of a malfunction in your equipment. This is a factor that should be considered since prompt corrective action can sometimes avoid serious and costly equipment breakdown. Reprints of an article on "Troubleshooting hydraulic systems," which tells you how to spot problems in a hydraulic system are available from Danfoss.

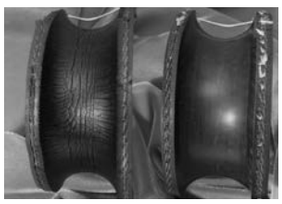
### Faulty hose

Occasionally a failure problem will lie in the hose itself. The most likely cause of a faulty rubber hose is old age. Check the lay line on the hose to determine the date of manufacture. (2Q99 means second quarter 1999.) The hose may have exceeded its recommended shelf life. If you suspect that the problem lies in the manufacture of the hose (and don't jump to this conclusion until you have exhausted the other possibilities) contact your distributor. Given effective quality control methods, the odds of a faulty batch of hose being released for sale are extremely small. So make sure that you haven't overlooked some other problem area.

## Analyzing failures

A physical examination of the failed hose can often offer a clue to the cause of the failure. Following are 22 symptoms to look for along with the conditions that could cause them:

**1. Symptom:** The hose tube is very hard and has cracked.



**Cause:** Heat has a tendency to leach the plasticizers out of the tube. This is a material that gives the hose its flexibility or plasticity.

Aerated oil causes oxidation to occur in the tube. This reaction of oxygen on a rubber product will cause it to harden. Any combination of oxygen and heat will greatly accelerate the hardening of the hose tube. Cavitation occurring inside the tube would have the same effect.

**2. Symptom:** The hose is cracked both externally and internally but the elastomeric materials are soft and flexible at room temperature.

**Cause:** The probable reason is intense cold ambient conditions while the hose was flexed. Most standard hoses are rated to –40°F (–40°C). Some hoses are rated at –55°F (–49°C). Military specified hoses are generally rated to –65°F (–54°C). PTFE hose is rated to –100°F (–73°C). Some Everflex Polyon thermoplastic hoses are rated at –65°F (–54°C).

**3. Symptom:** The hose has burst and examination of the wire reinforcement after stripping back the cover reveals random broken wires the entire length of the hose.

**Cause:** This would indicate a high frequency pressure impulse condition. SAE impulse test requirements for a double wire braid reinforcement are 200,000 cycles at 133% of recommended working pressure. The SAE impulse test requirements for a four spiral wrapped reinforcement (100R12) are 500,000 cycles at 133% maximum operating and at +250°F (121°C). If the extrapolated impulses in a system amount to over a million in a relatively short time a spiral reinforced hose would be the better choice.



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## Analyzing failures

**4. Symptom**: The hose has burst, but there is no indication of multiple broken wires the entire length of the hose. The hose may have burst in more than one place.

**Cause:** This would indicate that the pressure has exceeded the minimum burst strength of the hose. Either a stronger hose is needed or the hydraulic circuit has a malfunction which is causing unusually high pressure conditions.

**5. Symptom:** Hose has burst. An examination indicates the wire braid is rusted and the cover has been cut, abraded or deteriorated badly.

**Cause:** The primary function of the cover is to protect the reinforcement. Elements that may destroy or remove the hose covers are:

1. Abrasion
2. Cutting
3. Battery acid
4. Steam cleaners
5. Chemical cleaning solutions
6. Muriatic acid (for cement clean-up)
7. Salt water
8. Heat
9. Extreme cold

Once the cover protection is gone the wire reinforcement is susceptible to attack from moisture or other corrosive matter.

**6. Symptom:** Hose has burst on the outside bend and appears to be elliptical in the bent section. In the case of a pump supply line, the pump is noisy and very hot. The exhaust line on the pump is hard and brittle.

**Cause:** Violation of the minimum bend radius is most likely the problem in both cases. Check the minimum bend radius and make sure that the application is within specifications. In the case of the pump supply line partial collapse of the hose is causing the pump to cavitate creating both noise and heat. This is a most serious situation and will result in catastrophic pump failure if not corrected.

**7. Symptom:** Hose appears to be flattened out in one or two areas and appears to be kinked. It has burst in this area and also appears to be twisted.

**Cause:** Torquing of a hydraulic control hose will tear loose the reinforcement layers and allow the hose to burst through the enlarged gaps between the braided plaits of wire strands. Use swivel fittings or joints to be sure there is no twisting force on a hydraulic hose.

**8. Symptom:** Hose type has broken loose from the reinforcement and piled up the end of the hose. In some cases it may protrude from the end of the hose fitting.

**Cause:** The probable cause is high vacuum or the wrong hose for vacuum service. No vacuum is recommended for double wire braid, 4 and 6 spiral wire hose unless some sort of internal coil support is used. Even though a hose is rated for vacuum service, if it is kinked, flattened out or bent too sharply this type of failure may occur.

**9. Symptom:** Hose has burst about six to eight inches away from the end fitting. The wire braid is rusted. There are no cuts or abrasions of the outer cover.

**Cause:** Improper assembly

of the hose end fitting allowing moisture to enter around the edge of the fitting socket. The moisture will wick through the reinforcement. The heat generated by the system will drive it out around the fitting area but six to eight inches away it will be entrapped between the inner line and outer cover causing corrosion of the wire reinforcement.

**10. Symptom:** There are blisters in the cover of the hose. If one pricks the blisters, oil will be found in them.

**Cause:** A minute pin hole

in the hose tube is allowing the high pressure oil to seep between it and the cover. Eventually it will form a blister wherever the cover adhesion is weakest. In the case of a screw together reusable fitting insufficient lubrication of the hose and fitting can cause this condition because the dry tube will adhere to the rotating nipple and tear enough to allow seepage. Faulty hose can also cause this condition.

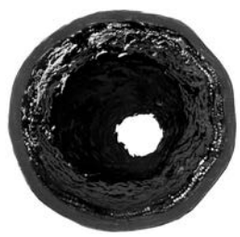
**11. Symptom:** Blistering of the hose cover where a gaseous fluid is being used.

**Cause:** The high pressure gas is effusing through the hose tube, gathering under the cover and eventually forming a blister wherever the adhesion is weakest. Specially constructed hoses are available for high pressure gaseous applications. Your supplier can advise you on the proper hose to use in these cases.

**12. Symptom:** Fitting blew off of the end of the hose.

**Cause:** It may be that the wrong fitting has been put on the hose. Recheck manufacturer's specifications and part numbers. In the case of a crimped fitting the wrong machine setting may have been used resulting in over or under crimping. The socket of a screw together fitting for multiple wire braided hose may be worn beyond its tolerance. The swaging dies in a swaged hose assembly may be worn beyond the manufacturer's tolerances. The fitting may have been applied improperly to the hose. Check manufacturer's instructions. The hose may have been installed without leaving enough slack to compensate for the possible 4% shortening that may occur when the hose is pressurized. This will impose a great force on the fitting. The hose itself may be out of tolerance.

**13. Symptom:** The tube of the hose is badly deteriorated with evidences of extreme swelling. In some cases the hose tube may be partially "washed out."



**Cause:** Indications are that the hose tube is not compatible with the agent being carried. Even though the agent is normally compatible, the addition of heat can be the catalyst that can cause inner liner deterioration. Consult your hose supplier for a compatibility list or present him with a sample of the fluid being conducted by the hose for analysis. Make sure that the operating temperatures both internal and external do not exceed recommendations.

**14. Symptom:** Hose has burst. The hose cover is badly deteriorated and the surface of the rubber is crazed.



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# Analyzing failures

**Cause:** This could be simply old age. The crazed appearance is the effect of weathering and ozone over a period of time. Try to determine the age of the hose. Some manufacturers print or emboss the cure date on the outside of the hose. As an example, Aeroquip hose would show "4Q01" which would mean that the hose was manufactured during the fourth quarter (October, November or December) of 2001.

**15. Symptom:** Hose is leaking at the fitting because of a crack in the metal tube adjacent to the braze on a split flange head.

**Cause:** Because the crack is adjacent to the braze and not in the braze this is a stress failure brought on by a hose that is trying to shorten under pressure and has insufficient slack in it to do so. We have cured dozens of these problems by lengthening the hose assembly or changing the routing to relieve the forces on the fitting.

**16. Symptom:** A spiral reinforced hose has burst and literally split open with the wire exploded out and badly entangled.

**Cause:** The hose is too short to accommodate the change in length occurring while it is pressured.

**17. Symptom:** Hose is badly flattened out in the burst area. The tube is very hard down stream of the burst but appears normal up stream of the burst.

**Cause:** The hose has been kinked either by bending it too sharply or by squashing it in some way so that a major restriction was created. As the velocity of the fluid increases through the restriction the pressure decreases to the vaporization point of the fluid being conveyed. This is commonly called cavitation, and causes heat and rapid oxidation to take place which hardens the tube of the hose down stream of the restriction.

**18. Symptom:** Hose has not burst but it is leaking profusely. A bisection of the hose reveals that the tube has been gouged through to the wire braid for a distance of approximately two inches.

**Cause:** This failure would indicate that erosion of the hose tube has taken place. A high velocity needle like fluid stream being emitted from an orifice and impinging at a single point on the hose tube will hydraulically remove a section of it. Be sure that the hose is not bent close to a port that is orificed. In some cases where high velocities are encountered particles in the fluid can cause considerable erosion in bent sections of the hose assembly.

**19. Symptom:** The hose fitting has been pulled out of the hose. The hose has been considerably stretched out in length. This may not be a high pressure application.

**Cause:** Insufficient support of the hose. It is very necessary to support very long lengths of hose, especially if they are vertical. The weight of the hose along with the weight of the fluid inside the hose in these cases is being imposed on the hose fitting. This force can be transmitted to a wire rope or chain by clamping the hose to it much like the utilities support bundles of wire from pole to pole. Be sure to leave sufficient slack in the hose between clamps to make up for the possible 4% shortening that could take place when the hose is pressurized.

**20. Symptom:** The hose has not burst but it is leaking profusely. An examination of the bisected hose reveals that the tube has burst inwardly.

**Cause:** This type of failure is commonly referred to as hose tube blow down. It is usually associated with very low viscosity fluids such as air, nitrogen, freon and other gases. What happens is that under high pressure conditions the gases will effuse into the pores of the hose tube charging them up like miniature accumulators. If the pressure is very suddenly reduced to zero the entrapped gases literally explode out of the tube often tearing holes in it. In some hose constructions a second hose tube made from a plastic such as nylon, is inserted into the hose.

A small leak will allow the gaseous fluid to seep between the two inner liners and when pressure is reduced to zero the innermost liner will collapse because the entrapped pressure around its inner diameter.

**21. Symptom:** PTFE hose assembly has collapsed internally in one or more places.

**Cause:** One of the most common causes for this is improper handling of the PTFE assembly. PTFE is a thermoplastic material which is not rubber-like. When bent sharply it simply collapses. This type of collapse is localized in on area and is radical. When the PTFE tube is folded longitudinally in one or more places this could be the result of heat (which softens the hose) along with vacuum conditions inside of it. Because of the additional tension of the wire braid, reinforcement inherent with this type of hose, there is always a radial tension on the tube trying to push it in. Rapid cycling from a very hot agent in the hose to a very cold agent in the hose can produce the same type of failure. Danfoss Aeroquip offers an internal support coil that will eliminate this problem.

**22. Symptom:** A PTFE hose assembly has developed a pin hole leak or several pin hole leaks.

**Cause:** This situation occurs when a petroleum based fluid, with low viscosity, is flowing at high velocity. This condition can generate high voltage use to static electricity. The high voltage is seeking a ground connection and the only ground connection available is the braided stainless steel reinforcement. This causes an electric arc, which penetrates through the PTFE tube as it travels to the reinforcement. Specially constructed PTFE tubes are available that have enough carbon black in them so as to be conductive. They will "drain off" the static electricity and preclude this problem.



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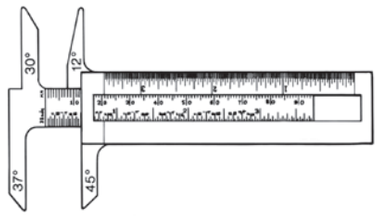
# Fluid connectors identification

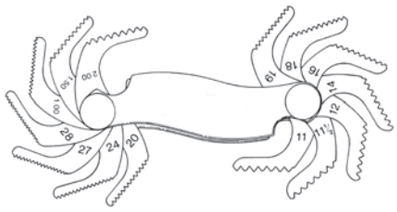
Measuring Tools: A seat angle gauge, thread pitch gauge and an I.D./O.D. caliper are necessary to make accurate measurements of commonly used connectors. Eaton offers a unique new caliper than offers the capabilities of both a caliper and a seat angle gauge in one unit.

## FT1341

### Identification Tool Kit

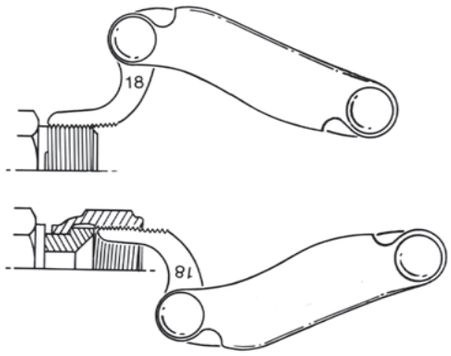



I.D./O.D. Angle gauge caliper

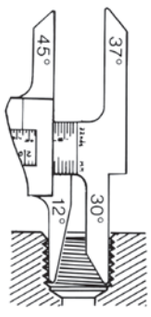



Thread pitch gauge

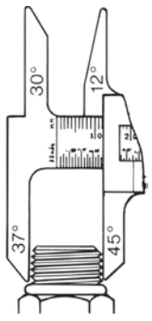
## How to measure threads




Use a thread pitch gauge to determine the number of threads per inch or the distance between threads in metric connections. Place the gauge on the threads until the fit is snug. Match the measurement to the charts.




I.D.

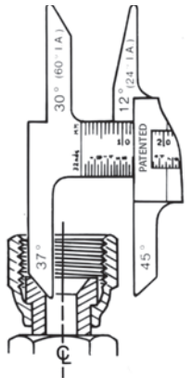



O.D.

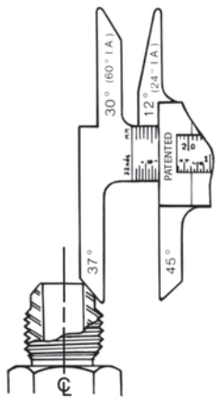
Measure the thread diameter with an I.D./O.D. caliper as shown. Match the measurements to the charts.

## How to measure sealing surface angles

**Female** connections are usually measured by inserting the gauge into the connection and placing it on the sealing surface. If the centerlines of the connection and gauge are parallel, the correct angle has been determined.




**Male flare type** connectors are usually measured by placing the gauge on the sealing surface. If the centerlines of the connection and gauge are parallel, the correct angle has been determined.



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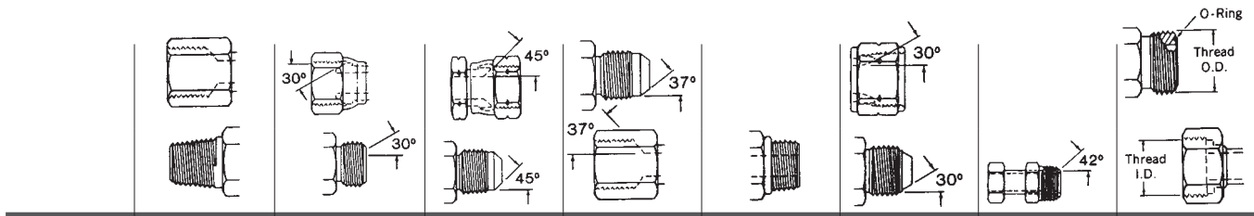
# Thread size chart

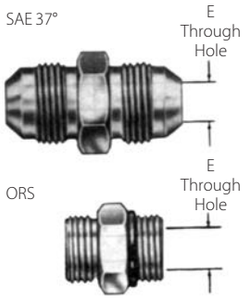
The following chart is intended as a quick reference guide for thread size by dash size.




| Dash size | N.P.T.F. | N.P.S.M. approx. dia. | SAE 45° auto. refrig. | SAE 37° (J.I.C.) hydraulic | SAE O-Ring boss | P.T.T. 30° automotive | SAE invert. flare | ORS |
|---|---|---|---|---|---|---|---|---|
| –02 | 1/8–27 | 1/8–27 | 5/16–24 | 5/16–24 | 5/16–24 | - | 5/16–24 | - |
| –03 | - | - | 3/8–24 | 3/8–24 | 3/8–24 | - | 3/8–24 | - |
| –04 | 1/4–18 | 1/4–18 | 7/16–20 | 7/16–20 | 7/16–20 | - | 7/16–24 | 9/16–18 |
| –05 | - | - | 1/2–20 | 1/2–20 | 1/2–20 | - | 1/2–20 | - |
| –06 | 3/8–18 | 3/8–18 | 5/8–18 | 9/16–18 | 9/16–18 | - | 5/8–18 | 11/16–16 |
| –07 | - | - | 11/16–24 | - | - | - | 11/16–18 | - |
| –08 | 1/2–14 | 1/2–14 | 3/4–16 | 3/4–16 | 3/4–16 | - | 3/4–18 | 13/16–16 |
| –10 | - | - | 7/8–14 | 7/8–14 | 7/8–14 | - | 7/8–18 | 1–14 |
| –12 | 3/4–14 | 3/4–14 | 1 1/16–14 | 1 1/16–12 | 1 1/16–12 | - | 1 1/16–16 | 1 3/16–12 |
| –14 | - | - | - | 1 3/16–12 | 1 3/16–12 | - | - | - |
| –16 | 1–11 1/2 | 1–11 1/2 | - | 1 5/16–12 | 1 5/16–12 | 1 5/16–14 | - | 1 7/16–12 |
| –20 | 1 1/4–11 1/2 | 1 1/4–11 1/2 | - | 1 5/8–12 | 1 5/8–12 | 1 5/8–14 | - | 1 11/16–12 |
| –24 | 1 1/2–11 1/2 | 1 1/2–11 1/2 | - | 1 7/8–12 | 1 7/8–12 | 1 7/8–14 | - | 2–12 |
| –32 | 2–11 1/2 | 2–11 1/2 | - | 2 1/2–12 | 2 1/2–12 | 2 1/2–12 | - | - |
| –40 | 2 1/2–8 | 2 1/2–8 | - | 3–12 | 3–12 | - | - | - |
| –48 | 3–8 | 3–8 | - | 3 1/2–12 | 3 1/2–12 | - | - | - |

## Through hole dimensions

All dimensions are nominal. In jump size bodies, the minimum through hole dimensions will correspond to the smallest dash size.




| Dash size | E through hole | | | |
|---|---|---|---|---|
| | SAE 37° | | ORS | |
| | mm | in | mm | in |
| –03 | 3,0 | 0.12 | - | - |
| –04 | 4,3 | 0.17 | 4,3 | 0.17 |
| –05 | 5,8 | 0.23 | - | - |
| –06 | 7,6 | 0.30 | 6,6 | 0.26 |
| –08 | 9,9 | 0.39 | 9,7 | 0.38 |
| –10 | 12,2 | 0.48 | 12,2 | 0.48 |
| –12 | 15,5 | 0.61 | 15,5 | 0.61 |
| –16 | 21,3 | 0.84 | 20,6 | 0.81 |
| –20 | 25,8 | 1.08 | 26,7 | 1.05 |
| –24 | 33,3 | 1.31 | 33,3 | 1.31 |
| –32 | 45,2 | 1.78 | - | - |



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# Proper tube installation

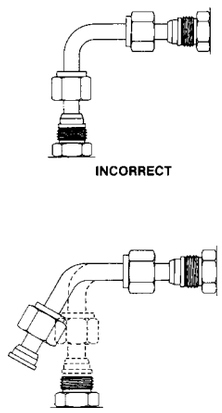


Figure 1

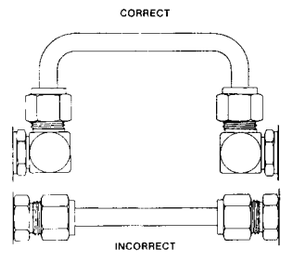


Figure 2

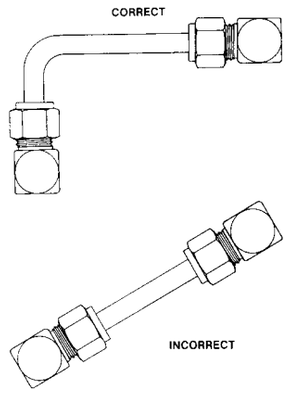


Figure 3

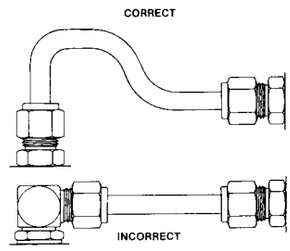


Figure 4

When compared to rigid pipe, hydraulic tubing offers the following advantages:

1. Size for size, tubing is lighter in weight, easier to handle and can be bent more easily than iron pipe.
2. Bent tubing reduces pressure drop and turbulence in the system because it eliminates sudden change in the direction of the fluid flow.
3. Hydraulic tubing reduces the number of connections required, thus reducing material and labor costs.
4. Fewer joints means lower costs and fewer points of potential leakage.
5. The use of tube fittings makes every joint a union which permits easier, faster maintenance and repair work.
6. The ORS-TF Tube Fitting eliminates the need for threading, brazing or welding.

## Tube bending

To reduce the number of fittings in a tube assembly, bend the tubing whenever possible.

Steel tubing can be bent in many sizes by using a hand bender designed for steel tubing. For production quantities, or for larger sizes, a power bending tool is generally used.

Contact Eaton for additional tube bending information.

## Tube routing and installation

Tubing manufacturers will advise the correct radii for various types and wall thicknesses of tubing. Kinks, flattened bends, wrinkles and tube breakage can be avoided by the use of proper tube bending equipment.

Avoid straight line connections whenever possible, especially in short runs.

Fluid conveying systems (see figures 2, 3 and 4) should be designed to follow the contour of the equipment. They are easier to install and present a neater appearance. Long runs should be supported by brackets or clamps. All heavy systems components should be bolted or clamped to eliminate tubing fatigue.

Inspect the tubing to see that it conforms to the required specifications before installation.

Tubes should align with the center line of the fittings, without distortion or tension. Tubing should not be sprung into position (see figure 1) to be assembled to the fitting. If this occurs the tubing has not been properly fabricated, and when installed and connected, places the tubing under stress.



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# Hydraulic tubing–Maximum operating pressures

**SAEJ356, J524, J525, J526, J527**

| Tube O.D. | Dash size | Tubing wall thickness (in inches) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - | - | 0.028 | | 0.035 | | 0.049 | | 0.065 | | 0.083 | | 0.095 | |
| - | - | **bar** | **psi** | **bar** | **psi** | **bar** | **psi** | **bar** | **psi** | **bar** | **psi** | **bar** | **psi** |
| 0.19 | -03 | 297,0 | 4250 | 375,0 | 5450 | - | - | - | - | - | - | - | - |
| 0.25 | -04 | 213,0 | 3100 | 272,0 | 3950 | 396,0 | 5750 | 420,0 | 6000 | - | - | - | - |
| 0.31 | -05 | 169,0 | 2450 | 213,0 | 3100 | 315,0 | 4500 | 420,0 | 6000 | - | - | - | - |
| 0.38 | -06 | 140,0 | 2000 | 175,0 | 2550 | 251,0 | 3650 | 350,0 | 5000 | 420,0 | 6000 | 420,0 | 6000 |
| 0.50 | -08 | - | - | 127,0 | 1850 | 186,0 | 2700 | 251,0 | 3650 | 335,0 | 4800 | 388,0 | 5550 |
| 0.62 | -10 | - | - | 105,0 | 1500 | 145,0 | 2100 | 196,0 | 2850 | 258,0 | 3750 | 299,0 | 4350 |
| 0.75 | -12 | - | - | 84,0 | 1200 | 122,0 | 1750 | 162,0 | 2350 | 210,0 | 3050 | 248,0 | 3550 |
| 1.00 | -16 | - | - | 62,0 | 900 | 89,0 | 1300 | 122,0 | 1750 | 157,0 | 2250 | 182,0 | 2600 |
| 1.25 | -20 | - | - | - | - | 70,0 | 1000 | 93,0 | 1350 | 122,0 | 1750 | 143,0 | 2050 |
| 1.50 | -24 | - | - | - | - | - | - | 79,0 | 1150 | 100,0 | 1450 | 119,0 | 1700 |
| 2.00 | -32 | - | - | - | - | - | - | 58,0 | 850 | 77,0 | 1100 | 87,0 | 1250 |

| Tube O.D. | Dash size | Tubing wall thickness (in inches) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - | - | 0.109 | | 0.120 | | 0.134 | | 0.148 | | 0.156 | | 0.188 | |
| - | - | **bar** | **psi** | **bar** | **psi** | **bar** | **psi** | **bar** | **psi** | **bar** | **psi** | **bar** | **psi** |
| 0.19 | -03 | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.25 | -04 | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.31 | -05 | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.38 | -06 | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.50 | -08 | 420,0 | 6000 | 420,0 | 6000 | - | - | - | - | - | - | - | - |
| 0.62 | -10 | 353,0 | 5050 | 392,0 | 5600 | - | - | - | - | - | - | - | - |
| 0.75 | -12 | 286,0 | 4150 | 322,0 | 4600 | - | - | - | - | - | - | - | - |
| 1.00 | -16 | 210,0 | 3000 | 231,0 | 3350 | 262,0 | 3800 | 294,0 | 4200 | - | - | - | - |
| 1.25 | -20 | 162,0 | 2350 | 182,0 | 2650 | 189,0 | 2700 | 203,0 | 2950 | 217,0 | 3100 | 259,0 | 3750 |
| 1.50 | -24 | 134,0 | 1950 | 148,0 | 2150 | 171,0 | 2450 | 171,0 | 2450 | 182,0 | 2600 | 220,0 | 3150 |
| 2.00 | -32 | 100,0 | 1450 | 112,0 | 1600 | 126,0 | 1800 | 140,0 | 2000 | 147,0 | 2100 | 178,0 | 2550 |

Maximum operating pressure ratings at specified wall thickness are based upon recommended tubing ratings per SAEJ1065 as well as limited laboratory test data. Operating pressures are based upon a 4:1 safety factor relative to tube burst data. Eaton recommends a maximum operating pressure of the joint which is the lesser of the tubing rating or the mating connector rating.



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## Recommended wall thickness for tube fitting applications

| Tube | Dash | Versil-Flare SAE 37° flare | Versil-Flare SAE 37° flareless | ORS-BR SAE O-Ring face seal | ORS-TF SAE O-ring face seal |
|---|---|---|---|---|---|
| 0.19 | -03 | 0.028 - 0.035 | 0.028 - 0.035 | - | - |
| 0.25 | -04 | 0.028 - 0.065 | 0.028 - 0.065 | 0.028 - 0.065 | 0.028 - 0.065 |
| 0.31 | -05 | 0.028 - 0.065 | 0.028 - 0.065 | - | - |
| 0.38 | -06 | 0.028 - 0.065 | 0.028 - 0.095 | 0.035 - 0.083 | 0.028 - 0.065 |
| 0.50 | -08 | 0.035 - 0.083 | 0.035 - 0.120 | 0.035 - 0.109 | 0.035 - 0.120 |
| 0.62 | -10 | 0.035 - 0.095 | 0.035 - 0.120 | 0.035 - 0.120 | 0.035 - 0.095 |
| 0.75 | -12 | 0.035 - 0.109 | 0.035 - 0.120 | 0.035 - 0.120 | 0.049 - 0.120 |
| 1.00 | -16 | 0.035 - 0.120 | 0.035 - 0.134 | 0.049 - 0.148 | 0.049 - 0.134 |
| 1.25 | -20 | 0.049 - 0.120 | 0.049 - 0.188 | 0.049 - 0.188 | 0.049 - 0.156 |
| 1.50 | -24 | 0.065 - 0.120 | 0.065 - 0.188 | 0.065 - 0.188 | 0.065 - 0.188 |
| 2.00 | -32 | 0.065 - 0.134 | 0.065 - 0.188 | - | - |

## Recommended hydraulic tubing material specifications

| Hydraulic tubing SAE specifications | | | |
|---|---|---|---|
| Versil-Flare SAE 37° flare | Versil-Flare SAE 37° flareless | ORS-BR SAE O-ring face seal | ORS-TF SAE O-ring face seal |
| SAEJ524 | SAEJ356 | SAEJ356 | SAEJ356 |
| SAEJ525 | SAEJ524 | SAEJ524 | SAEJ524 |
| - | SAEJ525 | SAEJ525 | SAEJ525 |
| - | SAEJ527 | SAEJ526 | SAEJ526 |

**Hydraulic tubing material description**

SAEJ356 electric resistance welded flash controlled low carbon steel, SAEJ524 seamless annealed low carbon steel, SAEJ525 electric resistance welded cold worked annealed, SAEJ526 single wall welded low carbon steel (automotive), SAEJ527 brazed double wall low carbon steel (automotive). The maximum hardness of the above tubing should not exceed Rockwell B65.



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# How to measure non-threaded connections

### Four bolt flange

First measure the port hole diameter using the caliper. Next, measure the longest bolt hole spacing from center- to-center or measure the flange head diameter.

### Staplok

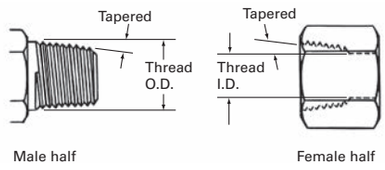
Measure the male diameter with the O.D. portion of the caliper. Measure the female half by inserting the I.D. portion of the caliper into the through hole.

### Dash numbers

Most fluid piping system sizes in the United States are measured by dash numbers. These are universally used abbreviations for the size of the component expressed as the numerator of the fraction with the denominator always being 16. For example, a –04 port is 4/16 or 1/4-inch. Dash numbers are usually nominal (in name only) and are abbreviations that make ordering of components easier.

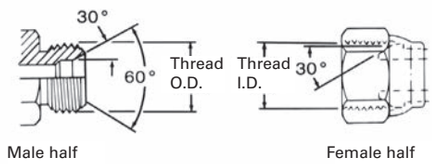
# American connections

### NPTF (National pipe tapered fuel)




This connection is still widely used in fluid power systems, even though it is not recommended by the National Fluid Power Association (NFPA) for use in hydraulic applications. The thread is tapered and the seal takes place by deformation of the threads.

### NPSM (National pipe straight mechanical)




This connection is sometimes used in fluid power systems. The female half has a straight thread and an inverted 30° seat. The male half of the connection has a straight thread and a 30° internal chamfer. The seal takes place by compression of the 30° seat on the chamfer. The threads hold the connection mechanically.

A properly chamfered NPTF male will also seal with the NPSM female.

| NPTF threads | Measure thread diameter and subtract 1/4-inch to find the nominal pipe size. | | | | | |
|---|---|---|---|---|---|---|
| Inch size | Dash size. | Nominal thread size | Male thread O.D. inch | | Female thread I.D. inch | |
| | | | Fract. | Dec. | Frac. | Dec. |
| 1/8 | 02 | 1/8-27 | 13/32 | 0.41 | 3/8 | 0.38 |
| 1/4 | 04 | 1/4-18 | 17/32 | 0.54 | 1/2 | 0.49 |
| 3/8 | 06 | 3/8-18 | 11/16 | 0.68 | 5/8 | 0.63 |
| 1/2 | 08 | 1/2-14 | 27/32 | 0.84 | 25/32 | 0.77 |
| 3/4 | 12 | 3/4-14 | 1 1/16 | 1.05 | 1 | 0.98 |
| 1 | 16 | 1-11 1/2 | 1 5/16 | 1.32 | 1 1/4 | 1.24 |
| 1 1/4 | 20 | 1 1/4-11 1/2 | 1 21/32 | 1.66 | 1 19/32 | 0.58 |
| 1 1/2 | 24 | 1 1/2-11 1/2 | 1 29/32 | 1.90 | 1 13/16 | 1.82 |
| 2 | 32 | 2-11 1/2 | 2 3/8 | 2.38 | 2 5/16 | 2.30 |

| NPSM threads | | | | | | |
|---|---|---|---|---|---|---|
| Inch size | Dash size. | Nominal thread size | Male thread O.D. inch | | Female thread I.D. inch | |
| | | | Fract. | Dec. | Fract. | Dec. |
| 1/8 | 02 | 1/8-27 | 13/32 | 0.41 | 3/8 | 0.38 |
| 1/4 | 04 | 1/4-18 | 17/32 | 0.54 | 1/2 | 0.49 |
| 3/8 | 06 | 3/8-18 | 11/16 | 0.68 | 5/8 | 0.63 |
| 1/2 | 08 | 1/2-14 | 27/32 | 0.84 | 25/32 | 0.77 |
| 3/4 | 12 | 3/4-14 | 1 1/16 | 1.05 | 1 | 0.98 |
| 1 | 16 | 1-11 1/2 | 1 5/16 | 1.32 | 1 1/4 | 1.24 |
| 1 1/4 | 20 | 1 1/4-11 1/2 | 1 21/32 | 1.66 | 1 19/32 | 0.58 |
| 1 1/2 | 24 | 1 1/2-11 1/2 | 129/32 | 1.90 | 1 13/16 | 1.82 |
| 2 | 32 | 2-11 1/2 | 2 3/8 | 2.38 | 2 5/16 | 2.30 |



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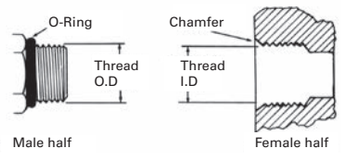
# American connections

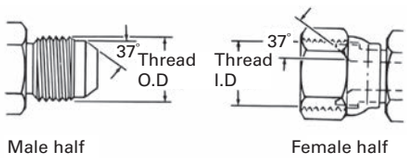
### SAE J1926 straight thread O-Ring boss (ORB)




This port connection is recommended by the NFPA for optimum leakage control in medium and high pressure hydraulic systems. The male connector has a straight thread and an O-Ring. The female port has a straight thread, a machined surface (minimum spotface) and a chamfer to accept the O-Ring. The seal takes place by compressing the O-Ring into the chamfer. The threads hold the connection mechanically.

| Inch size | Dash size. | Nominal thread size | Male thread O.D. inch | | Female thread I.D. inch | |
|---|---|---|---|---|---|---|
| | | | **Fract.** | **Dec.** | **Fract.** | **Dec.** |
| 1/8 | 02 | 5/16-24 | 5/16 | 0.31 | 9/32 | 0.27 |
| 3/16 | 03 | 3/8-24 | 3/8 | 0.38 | 11/32 | 0.34 |
| 1/4 | 04 | 7/16-20 | 7/16 | 0.44 | 13/32 | 0.39 |
| 5/16 | 05 | 1/2-20 | 1/2 | 0.50 | 15/32 | 0.45 |
| 3/8 | 06 | 9/16-18 | 9/16 | 0.56 | 17/32 | 0.51 |
| 1/2 | 08 | 3/4-16 | 3/4 | 0.75 | 3/4 | 0.69 |
| 5/8 | 10 | 7/8-14 | 7/8 | 0.88 | 13/16 | 0.81 |
| 3/4 | 12 | 1 1/16-12 | 1 1/16 | 1.06 | 1 | 0.98 |
| 7/8 | 14 | 1 3/16-12 | 1 3/16 | 1.19 | 1 1/8 | 1.13 |
| 1 | 16 | 1 5/16-12 | 1 5/16 | 1.31 | 1 1/4 | 1.23 |
| 1-1/4 | 20 | 1 5/8-12 | 1 5/8 | 1.63 | 1 9/16 | 1.54 |
| 1-1/2 | 24 | 1 7/8-12 | 1 7/8 | 1.88 | 1 13/16 | 1.79 |
| 2 | 32 | 2 1/2-12 | 2 1/2 | 2.50 | 2 7/16 | 2.42 |

### SAE J514 37° hydraulic

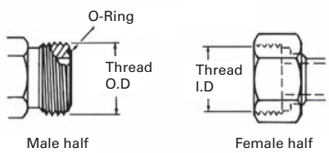



This connection is very common in fluid power systems. Both the male and female halves of the connections have 37° seats. The seal takes place by establishing a line contact between the male flare and the female cone seat. The threads hold the connection mechanically.

**Caution:** In the –02, –03, –04, –05, –08 and –10 sizes, the threads of the SAE 45° flare and the SAE 37° flare are the same. However, the sealing surface angles are not the same.

| Inch size | Dash size. | Nominal thread size | Male thread O.D. inch | | Female thread I.D. inch | |
|---|---|---|---|---|---|---|
| | | | **Fract.** | **Dec.** | **Fract.** | **Dec.** |
| 1/8 | 02 | 5/16-24 | 5/16 | 0.31 | 9/32 | 0.27 |
| 3/16 | 03 | 3/8-24 | 3/8 | 0.38 | 11/32 | 0.34 |
| 1/4 | 04 | 7/16-20 | 7/16 | 0.44 | 13/32 | 0.39 |
| 5/16 | 05 | 1/2-20 | 1/2 | 0.50 | 15/32 | 0.45 |
| 3/8 | 06 | 9/16-18 | 9/16 | 0.56 | 17/32 | 0.51 |
| 1/2 | 08 | 3/4-16 | 3/4 | 0.75 | 3/4 | 0.69 |
| 5/8 | 10 | 7/8-14 | 7/8 | 0.88 | 13/16 | 0.81 |
| 3/4 | 12 | 1 1/16-12 | 1 1/16 | 1.06 | 1 | 0.98 |
| 7/8 | 14 | 1 3/16-12 | 1 3/16 | 1.19 | 1 1/8 | 1.13 |
| 1 | 16 | 1 5/16-12 | 1 5/16 | 1.31 | 1 1/4 | 1.23 |
| 1-1/4 | 20 | 1 5/8-12 | 1 5/8 | 1.63 | 1 9/16 | 1.54 |
| 1-1/2 | 24 | 1 7/8-12 | 1 7/8 | 1.88 | 1 13/16 | 1.79 |
| 2 | 32 | 2 1/2-12 | 2 1/2 | 2.50 | 2 7/16 | 2.42 |

### ORS SAE J1453 O-Ring face seal




This connection offers the very best leakage control available today. The male connector has a straight thread and an O-Ring in the face. The female has a straight thread and a machined flat face.

The seal takes place by compressing the O-Ring onto the flat face of the female, similar to the split flange type fitting. The threads hold the connection mechanically.

| Inch size | Dash size. | Nominal thread size | Male thread O.D. inch | | Female thread I.D. inch | |
|---|---|---|---|---|---|---|
| | | | **Fraction** | **Decimal** | **Fraction** | **Decimal** |
| 1/4 | 04 | 9/16-18 | 9/16 | 0.56 | 17/32 | 0.51 |
| 3/8 | 06 | 11/16-16 | 11/16 | 0.69 | 5/8 | 0.63 |
| 1/2 | 08 | 13/16-16 | 13/16 | 0.82 | 3/4 | 0.75 |
| 5/8 | 10 | 1-14 | 1 | 1.00 | 15/16 | 0.93 |
| 3/4 | 12 | 1 3/16-12 | 1 3/16 | 1.19 | 1 1/8 | 1.11 |
| 1 | 16 | 1 7/16-12 | 1 7/16 | 1.44 | 1 3/8 | 1.36 |
| 1-1/4 | 20 | 1 11/16-12 | 1 11/16 | 1.69 | 1 5/8 | 1.61 |
| 1-1/2 | 24 | 2-12 | 2 | 2.00 | 1 15/16 | 1.92 |



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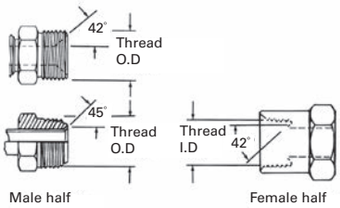
# American connections

## SAE J512 inverted

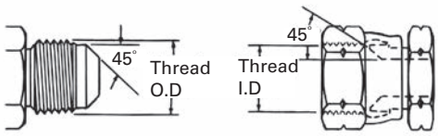



This connection is frequently used in automotive systems. The male connector can either be a 45° flare in the tube fitting form or a 42° seat in the machined adapter form.

The female has a straight thread with a 42° inverted flare. The seal takes place on the flared surfaces. The threads hold the connection mechanically.

| Inch size | Dash size. | Nominal thread size | Male thread O.D. inch | | Female thread I.D. inch | |
|---|---|---|---|---|---|---|
| | | | **Fract.** | **Dec.** | **Fract.** | **Dec.** |
| 1/8 | 02 | 5/16-24 | 5/16 | 0.32 | 9/32 | 0.28 |
| 3/16 | 03 | 3/8-24 | 3/8 | 0.38 | 11/32 | 0.34 |
| 1/4 | 04 | 7/16-24 | 7/16 | 0.44 | 13/32 | 0.40 |
| 5/16 | 05 | 1/2-20 | 1/2 | 0.50 | 15/32 | 0.45 |
| 3/8 | 06 | 5/8-18 | 5/8 | 0.63 | 9/16 | 0.57 |
| 7/16 | 07 | 11/16-18 | 11/16 | 0.69 | 5/8 | 0.63 |
| 1/2 | 08 | 3/4-18 | 3/4 | 0.75 | 23/32 | 0.70 |
| 5/8 | 10 | 7/8-18 | 7/8 | 0.88 | 13/16 | 0.82 |
| 3/4 | 12 | 1 1/16-16 | 1 1/16 | 1.06 | 1 | 1.00 |

## SAE J512 45°

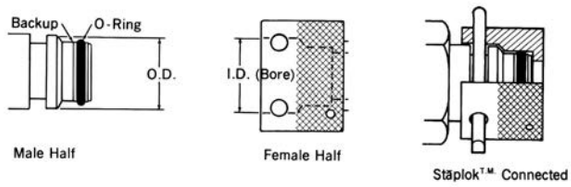



This connection is commonly used in refrigeration, automotive and truck piping systems. The connector is frequently made of brass. Both the male and female connectors have 45° seats. The seal takes place between the male flare the female cone seat. The threads hold the connection mechanically.

**Caution:** In the –02, –03, –04, –05, –08 and –10 sizes, the threads of the SAE 45° flare and the SAE 37° flare are the same. However, the sealing surface angles are not the same.

| Inch size | Dash size | Nominal thread size | Male thread O.D. inch | | Female thread I.D. inch | |
|---|---|---|---|---|---|---|
| | | | **Fract.** | **Dec.** | **Fract.** | **Dec.** |
| 1/8 | 02 | 5/16-24 | 5/16 | 0.31 | 9/32 | 0.27 |
| 3/16 | 03 | 3/8-24 | 3/8 | 0.38 | 11/32 | 0.34 |
| 1/4 | 04 | 7/16-20 | 7/16 | 0.44 | 13/32 | 0.39 |
| 5/16 | 05 | 1/2-20 | 1/2 | 0.50 | 15/32 | 0.45 |
| 3/8 | 06 | 5/8-18 | 5/8 | 0.63 | 9/16 | 0.57 |
| 1/2 | 08 | 3/4-16 | 3/4 | 0.75 | 11/16 | 0.69 |
| 5/8 | 10 | 7/8-14 | 7/8 | 0.88 | 13/16 | 0.81 |
| 3/4 | 12 | 1 1/16-14 | 1 1/16 | 1.06 | 1 | 0.99 |
| 7/8 | 14 | 1 1/4-12 | 1 1/4 | 1.25 | 1 5/32 | 1.16 |
| 1 | 16 | 1 3/8-12 | 1 3/8 | 1.38 | 1 9/32 | 1.29 |

## Staplok (SAE J1467)




This is a radial O-Ring seal connection developed in Germany and commonly used for hydraulic application in underground mines. The male contains an exterior O-Ring and backup ring, plus a groove to accept the "staple". The female has a smooth bore with two holes for the stable. A "U" shaped retaining clip or staple is inserted through the two holes, passing through the groove in the male to lock the connection together. The seal takes place by contact between the O-Ring in the male and the smooth bore of the female.

| Inch size | Dash size. | Nominal thread size | Male thread O.D. inch | | Female thread I.D. inch | |
|---|---|---|---|---|---|---|
| | | | **Fraction** | **Decimal** | **Fraction** | **Decimal** |
| 1/4 | 04 | - | 9/32 | 0.586 | 1 9/32 | 0.597 |
| 3/8 | 06 | - | 25/32 | 0.783 | 51/64 | 0.794 |
| 1/2 | 08 | - | 15/16 | 0.940 | 61/64 | 0.951 |
| 3/4 | 12 | - | 1 9/64 | 1.137 | 1 9/64 | 1.148 |
| 1 | 16 | - | 1 17/32 | 1.529 | 1 35/64 | 1.540 |
| 1-1/4 | 20 | - | 1 13/16 | 1.806 | 1 13/16 | 1.817 |
| 1-1/2 | 24 | - | 2 5/32 | 2.163 | 2 11/64 | 2.174 |
| 2 | 32 | - | 2 33/64 | 2.517 | 2 17/32 | 2.528 |



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# American connections and ISO connections

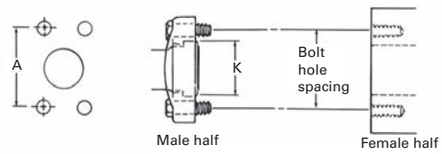
## American connections

### How to measure

Four Bolt Flange—First measure the port hole diameter using the caliper.

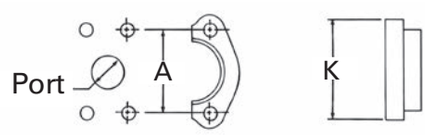
Next, measure the longest bolt hole spacing from center-to-center (Dimension "A") or measure the flanged head diameter.

**SAE J518 4-Bolt Flange***




This connection is commonly used in fluid power systems. There are two pressure ratings. Code 61 is referred to as the "standard" series and Code 62 is the "6000 psi" series. The design concept for both series is the same, but the bolt hole spacing and flanged head diameters are larger for the higher pressure, Code 62 connection. The female (port) is an unthreaded hole with four bolt holes in a rectangular pattern around the port. The male consists of a flanged head, grooved for an O-Ring, and either a captive flange or split flange halves with bolt holes to match the port. The seal takes place on the O-Ring, which is compressed between the flanged head and the flat surface surrounding the port. The threaded bolts hold the connection together.

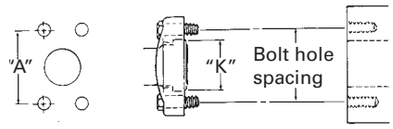
NOTE: * SAE J518, JIS B 8363, ISO/ DIS 6162 and DIN 20066 are interchangeable, except for bolt sizes.




| Inch Size (dash size) | Port hole I.D. inch fract. deci.) | Bolt dimension inch | | Bolt hole spacing "A" inch (dec) | | Flanged head dia. "K" inch (dec) | |
|---|---|---|---|---|---|---|---|
| | | **Cd. 61** | **Cd. 62** | **Cd. 61** | **Cd. 62** | **Cd. 61** | **Cd. 62** |
| 1/2 (08) | 1/2 (0.50) | 5/16-18x1 1/4 | 5/16-18x1 1/4 | 1 1/2 (1.50) | 1 19/32 (1.59) | 1 3/16 (1.19) | 1 1/4 (1.25) |
| 3/4 (12) | 3/4 (0.75) | 3/8-16x1 1/4 | 3/8-16x1 1/2 | 1 7/8 (1.88) | 2.00 (2.00) | 1 1/2 (1.50) | 1 5/8 (1.63) |
| 1 (16) | 1.00 (1.00) | 3/8-16x1 1/4 | 7/16-14x1 3/4 | 2 1/16 (2.06) | 2 1/4 (2.25) | 1 3/4 (1.75) | 1 7/8 (1.88) |
| 1 1/4 (20) | 1 1/4 (1.25) | 7/16-14x1 1/2 | 1/2-13x1 3/4 | 2 5/16 (2.31) | 2 5/8 (2.63) | 2.00 (2.00) | 2 1/8 (2.13) |
| 1 1/2 (24) | 1 1/2 (1.50) | 1/2-13x1 1/2 | 5/8-11x2 1/4 | 2 3/4 (2.75) | 3 1/8 (3.12) | 2 3/8 (2.38) | 2 1/2 (2.50) |
| 2 (32) | 2.00 (2.00) | 1/2-13x1 1/2 | 3/4-10x2 3/4 | 3 1/16 (3.06) | 3 13/16 (3.81) | 2 13/16 (2.81) | 3 1/8 (3.12) |

## ISO connections

**ISO/DIS 6162 4-bolt flange***



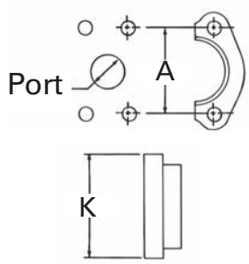

This connection is commonly used in fluid power systems. There are two pressure ratings. PN 35/350 bar (Code 61) is the "standard" series and PN 415 bar (Code 62) is the high pressure series. The design concept for both series is the same, but the bolt hole spacing and flanged head diameters are larger for the higher pressure, PN 415 bar connection. Both metric and inches bolts are used. The port will have an "M" stamped on it if metric bolts are required.

The female (port) is an unthreaded hole with four bolt holes in a rectangular pattern around the port. The male consists of a flanged head, grooved for an O-Ring, and either a captive flange or split flange halves with bolt holes to match the port. The seal takes place on the O-Ring, which is compressed between the flanged head and the flat surface surrounding the port. The threaded bolts hold the connection together.

* ISO/DIS 6162, DIN 20066, JIS B 8363 and SAE J518 are interchangeable, except for bolt sizes.

| Size | Port hole | Bolt dimensions spacing | | Bolt hole"A" | |
|---|---|---|---|---|---|
| | | **ISO 6162-1 Bar (Cd.61)** | **ISO 6162-2 Bar (Cd.62)** | **ISO 6162-1 Bar (Cd.61)** | **ISO 6162-2 Bar (Cd.62)** |
| **mm in (dash)** | **mm (in)** | **mm (in)** | **mm (in)** | **mm (in)** | **mm (in)** |
| 13 (1/2) (08) | 12,7 (.50) | M8 x 1.25x 30 (5/16–18 x 1-1/4) | M8 x 1.25 x 30 (5/16–18 x 1-1/4) | 38.1 (1.50) | 40.5 (1.57) |
| 19 (3/4) (12) | 19,1 (.75) | M10 x 1.5 x 35 (3/8–16 x 1-1/4) | M10 x 1.5 x 40 (3/8–16 x 1-1/2) | 47.6 (1.88) | 50.8 (2.00) |
| 25 (1) (16) | 25,4 (1.00) | M10 x 1.5 x 35 (3/8–16 x 1-1/4) | M12 x 1.75 x 45 (7/16–14 x 1-3/4) | 52.4 (2.06) | 57.2 (2.25) |
| 32 (1-1/4 (20) | 31,8 (1.25) | M10 x 1.5 x 40 (7/16–14 x 1-1/2) | M14 x 2 x 50 (1/2–13 x 1-3/4) | 58.7 (2.31) | 66.7 (2.63) |
| 38 (1-1/2 (24) | 38,1 (1.50) | M12 x 1.75 x 40 (1/2–13 x 1-1/2) | M16 x 2 x 55 (5/8–11 x 2-1/4) | 69.9 (2.75) | 79.4 (3.13) |
| 51 (2) (32) | 50,8 (2.00) | M12 x 1.75 x 40 (1/2–13 x 1-1/2) | M20 x 2.5 x 70 (3/4–10 x 2-3/4) | 77.8 (3.06) | 96.8 (3.81) |

| Inch size | Flanged head dia. "K" | | | |
|---|---|---|---|---|
| | **ISO 6162-1 Bar (Cd.61)** | | **ISO 6162-2 Bar (Cd.62)** | |
| | **mm** | **in** | **mm** | **in** |
| 1/2 | 30.18 | 1.19 | 31.75 | 1.25 |
| 3/4 | 38.10 | 1.50 | 41.28 | 1.63 |
| 1 | 44.45 | 1.75 | 47.63 | 1.88 |
| 1-1/4 | 50.80 | 2.00 | 53.98 | 2.13 |
| 1-1/2 | 60.33 | 2.38 | 63.50 | 2.50 |
| 2 | 71.42 | 2.81 | 79.38 | 3.13 |



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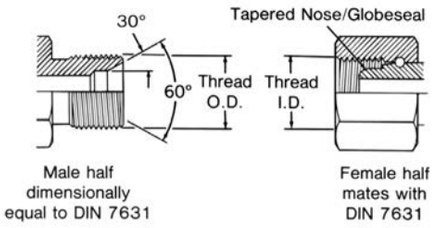
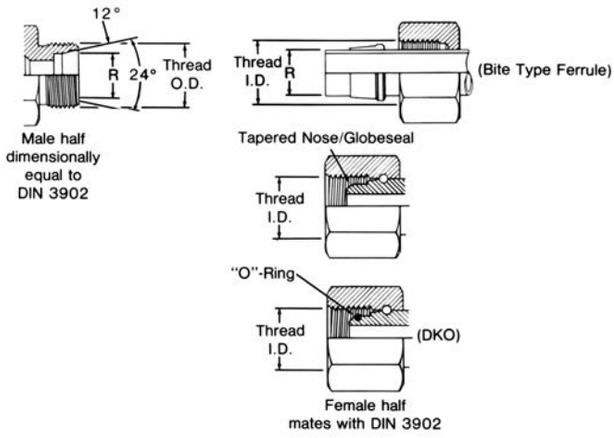
# German connections

## German connections

### DIN 7631 series




### DIN 3902 series




This connection is frequently used in hydraulic systems. The male has a straight metric thread and a 60° (included angle) recessed cone. The female has a straight thread and a tapered Nose/Globeseal seat. The seal takes place by contact between the cone of the male and the nose of the tapered Nose/Globeseal flareless swivel.

The threads hold the connection mechanically.

| Use with pipe/tube O.D. | | Metric thread size | Male thread O.D. | | Female thread I.D. | |
|---|---|---|---|---|---|---|
| **mm** | **in** | | **mm** | **in** | **mm** | **in** |
| 6 | 0.24 | M12 x 1.5 | 12 | 0.47 | 10,5 | 0.41 |
| 8 | 0.32 | M14 x 1.5 | 14 | 0.55 | 12,5 | 0.49 |
| 10 | 0.39 | M16 x 1.5 | 16 | 0.63 | 14,5 | 0.57 |
| 12 | 0.47 | M18 x 1.5 | 18 | 0.71 | 16,5 | 0.65 |
| 15 | 0.59 | M22 x 1.5 | 22 | 0.87 | 20,5 | 0.81 |
| 18 | 0.71 | M26 x 1.5 | 26 | 1.02 | 24,5 | 0.96 |
| 22 | 0.87 | M30 x 1.5 | 30 | 1.18 | 28,5 | 1.12 |
| 28 | 1.10 | M38 x 1.5 | 38 | 1.50 | 36,5 | 1.44 |
| 35 | 1.38 | M45 x 1.5 | 45 | 1.77 | 43,5 | 1.71 |
| 42 | 1.65 | M52 x 1.5 | 52 | 2.04 | 50,5 | 1.99 |

This connection style consists of a common male and three different female halves. The male has a straight metric thread, a 24° included angle and a recessed counterbore that matches the tube O.D. used with it. The female may be a tube, nut and ferrule, a tapered nose/Globeseal flareless swivel or a tapered Nose/Globeseal flareless swivel with an O-Ring in the Nose (DKO type).

| Tube O.D. "R" Dim. l.Rh.* | | Tube O.D. "R" Dim. s.Rh.† | | Metric thread Size | Male thread O.D. | | Female thread I.D. | |
|---|---|---|---|---|---|---|---|---|
| **mm** | **in.** | **mm** | **in** | | **mm** | **in** | **mm** | **in** |
| 6 | 0.24 | - | - | M12 x 1.5 | 12 | 0.47 | 10.5 | 0.41 |
| 8 | 0.32 | 6 | 0.24 | M14 x 1.5 | 14 | 0.55 | 12.5 | 0.49 |
| 10 | 0.39 | 8 | 0.32 | M16 x 1.5 | 16 | 0.63 | 14.5 | 0.57 |
| 12 | 0.47 | 10 | 0.39 | M18 x 1.5 | 18 | 0.71 | 16.5 | 0.65 |
| - | - | 12 | 0.47 | M20 x 1.5 | 20 | 0.78 | 18.5 | 0.73 |
| 15 | 0.59 | 14 | 0.55 | M22 x 1.5 | 22 | 0.87 | 20.5 | 0.81 |
| - | - | 16 | 0.63 | M24 x 1.5 | 24 | 0.94 | 22.5 | 0.89 |
| 18 | 0.71 | - | - | M26 x 1.5 | 26 | 1.02 | 24.5 | 0.96 |
| 22 | 0.87 | 20 | 0.78 | M30 x 2.0 | 30 | 1.18 | 28 | 1.11 |
| 28 | 1.10 | 25 | 0.98 | M36 x 2.0 | 36 | 1.41 | 34 | 1.34 |
| - | - | 30 | 1.18 | M42 x 2.0 | 42 | 1.65 | 40 | 1.57 |
| 35 | 1.38 | - | - | M45 x 2.0 | 45 | 1.77 | 43 | 1.70 |
| 42 | 1.65 | 38 | 1.50 | M52 x 2.0 | 52 | 2.04 | 50 | 1.97 |

*l.Rh. is a light duty system.

†s.Rh. is a heavy duty system.



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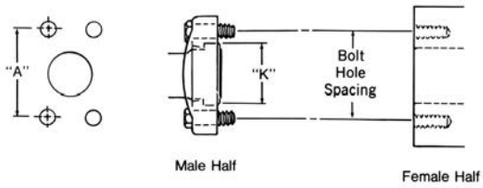
# German connections

## German connections

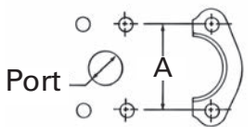
**DIN 20066 4-bolt flange***

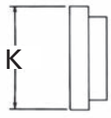



This connection is commonly used in fluid power systems. There are two pressure ratings. Form R (Code 61) is referred to as the "standard duty" series and Form S (Code 62) is the "heavy duty" series. The design concept for both series is the same, but the bolt hole spacing and flanged head diameters are larger for the higher pressure, Form S connection. Both metric and inch bolts are used. The female (port) is an unthreaded hole with four bolt holes in a rectangular pattern around the port. The male consists of a flanged head, grooved for an O-Ring, and either a captive flange or split flange halves with bolt holes to match the port. The seal takes place on the O-Ring, which is compressed between the flanged head and the flat surface surrounding the port.The threaded bolts hold the connection together.

**NOTE:** *DIN 20066, IS/DIS 6166, JIS B 8363 and SAE J518 are interchangeable, except for bolt sizes.

| Size mm (inch) (dash) | Port hole | Bolt dimensions | | Bolt hole spacing | |
|---|---|---|---|---|---|
| | | **Form R. (Cd. 61)** | **Form S (Cd. 62)** | **Form R (Cd. 61)** | **Form S (Cd. 62)** |
| | **mm (in)** | - | - | **mm (in)** | **mm (in)** |
| 12 (1/2) (08) | 12,7 (0.50) | M8 x 1.25x 30 5/16–18 x 1 1/4 | M8 x 1.25 x 30 5/16–18 x 1 1/4 | 38.10 (1.50) | 40.49 (1.57) |
| 20 (3/4) (12) | 19,1 (0.75) | M10 x 1.5 x 30 3/8–16 x 1 1/4 | M10 x 1.5 x 40 3/8–16 x 1 1/2 | 47.63 (1.88) | 50.80 (2.00) |
| 25 (1) (16) | 25,4 (1.00) | M10 x 1.5 x 35 3/8–16 x 1 1/4 | M12 x 1.75 x 45 7/16–14 x 1 3/4 | 52.37 (2.06) | 57.15 (2.25) |
| 32 (1-1/4) (20) | 31,7 (1.25) | M10 x 1.75 x 40 7/16–14 x 1 1/2 | M14 x 2 x 45 1/2–13 x 1 3/4 | 58.72 (2.31) | 66.68 (2.63) |
| 40 (1-1/2) (24) | 38,0 (1.50) | M12 x 1.75 x 40 1/2–13 x 1 1/2 | M16 x 2 x 55 5/8–11 x 2 1/4 | 69.85 (2.75) | 79.38 (3.13) |
| 50 (2) (32) | 50,8 (2.00) | M12 x 1.75 x 40 1/2–13 x 1 1/2 | M20 x 2.5 x 70 3/4–10 x 2 3/4 | 77.77 (3.06) | 96.82 (3.81) |




| Inch size | Flanged head dia. "K" | | | |
|---|---|---|---|---|
| | **Form R (Cd. 61)** | | **Form S (Cd. 62)** | |
| | **mm** | **in** | **mm** | **in** |
| 1/2 | 30.18 | 1.19 | 31.75 | 1.25 |
| 3/4 | 38.10 | 1.50 | 41.28 | 1.63 |
| 1 | 44.45 | 1.75 | 47.63 | 1.88 |
| 1 1/4 | 50.80 | 2.00 | 53.98 | 2.13 |
| 1 1/2 | 60.33 | 2.38 | 63.50 | 2.50 |
| 2 | 71.42 | 2.81 | 79.38 | 3.13 |



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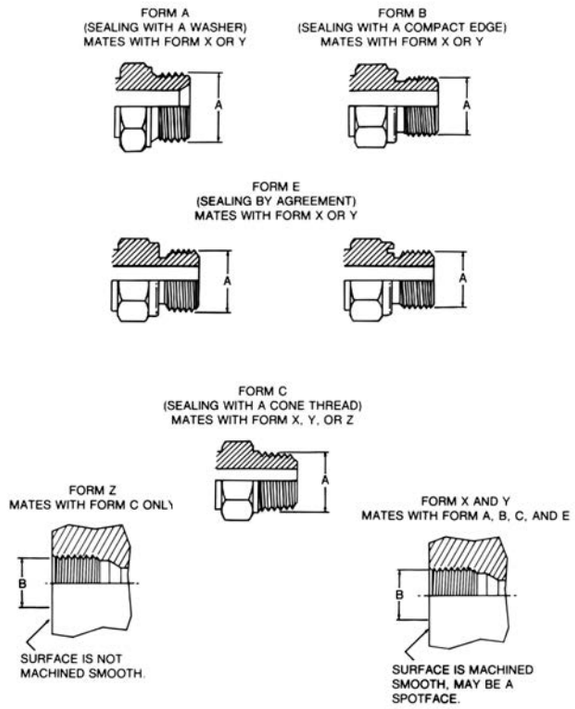
# German connections

## German connections

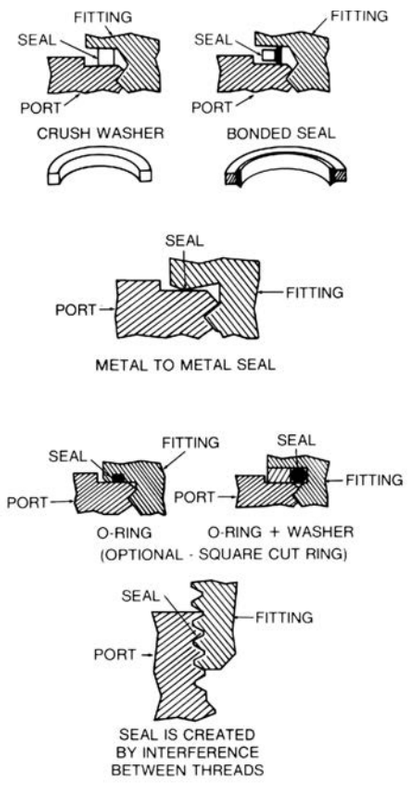
**DIN 3852 Male connectors and female ports**

| DIN 3852 metric threads | | | | |
|---|---|---|---|---|
| Metric thread | Male thread O.D. "A" | | Female thread I.D. "B" | |
| | mm | (in) | mm | (in) |
| M12 x 1.5 | 12 | 0.47 | 10,5 | 0.41 |
| M14 x 1.5 | 14 | 0.55 | 12,5 | 0.49 |
| M16 x 1.5 | 16 | 0.63 | 14,5 | 0.57 |
| M18 x 1.5 | 18 | 0.71 | 16,5 | 0.65 |
| M20 x 1.5 | 20 | 0.78 | 18,5 | 0.73 |
| M22 x 1.5 | 22 | 0.87 | 20,5 | 0.81 |
| M24 x 1.5 | 24 | 0.94 | 22,5 | 0.89 |
| M26 x 1.5 | 26 | 1.02 | 24,5 | 0.96 |
| M27 x 2 | 27 | 1.06 | 25 | 0.98 |
| M30 x 1.5 | 30 | 1.18 | 28,5 | 1.12 |
| M30 x 2 | 30 | 1.18 | 28 | 1.10 |
| M33 x 2 | 33 | 1.30 | 31 | 1.22 |
| M36 x 1.5 | 36 | 1.41 | 34,5 | 1.36 |
| M36 x 2 | 36 | 1.41 | 34 | 1.33 |
| M38 x 1.5 | 38 | 1.49 | 36,5 | 1.43 |
| M38 x 2 | 38 | 1.49 | 36 | 1.41 |
| M42 x 1.5 | 42 | 1.65 | 40,5 | 1.60 |
| M42 x 2 | 42 | 1.65 | 40 | 1.57 |
| M45 x 1.5 | 45 | 1.77 | 43,5 | 1.71 |
| M45 x 2 | 45 | 1.77 | 43 | 1.69 |
| M48 x 1.5 | 48 | 1.89 | 46,5 | 1.83 |
| M48 x 2 | 48 | 1.89 | 46 | 1.81 |
| M52 x 1.5 | 52 | 2.04 | 50,5 | 1.89 |
| M52 x 2 | 52 | 2.04 | 50 | 1.97 |

For DIN 3852 Whitworth pipe thread dimensions, see BSPT/BSPP dimensions. They are the same.




## How the seal works



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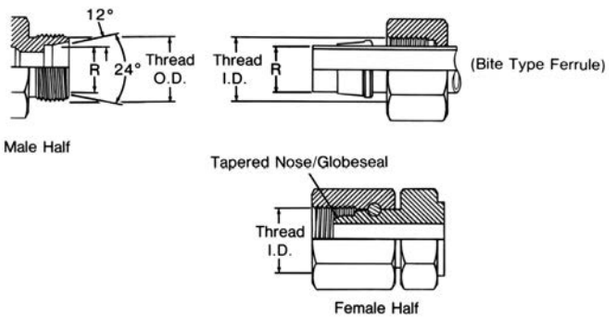
# French & British connections

## French connections

### Millimetrique and GAZ series



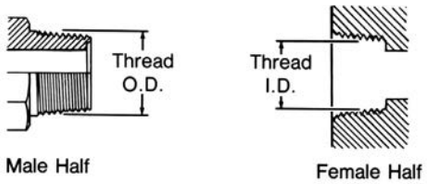

This connection consists of a common male and two different females. The millimetric series is used with whole number metric O.D. tubing and the GAZ Series is used with fractional number metric O.D. pipe size tubing.

**Millimetric and GAZ threads**

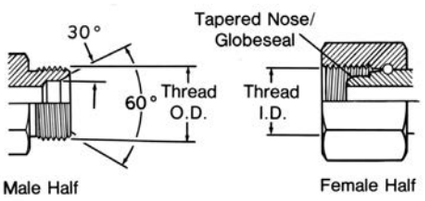
| Tubing O.D. "R" dim. | | "Gaz" pipe O.D. R" dim. | | Metric thread | Male Thread O.D. "A" | | Female Thread I.D. "B" | |
|---|---|---|---|---|---|---|---|---|
| **mm** | **in** | **mm** | **in** | | **mm** | **(in)** | **mm** | **(in)** |
| 6 | 0.24 | - | - | M12 x 1.5 | 12 | 0.47 | 11 | 0.43 |
| 8 | 0.32 | - | - | M14 x 1.5 | 14 | 0.55 | 12.5 | 0.49 |
| 10 | 0.39 | - | - | M16 x 1.5 | 16 | 0.63 | 14.5 | 0.57 |
| 12 | 0.47 | - | - | M18 x 1.5 | 18 | 0.71 | 16.5 | 0.65 |
| 14 | 0.55 | 13.25 | 0.52 | M20 x 1.5 | 20 | 0.78 | 18.5 | 0.73 |
| 15 | 0.59 | - | - | M22 x 1.5 | 22 | 0.87 | 20.5 | 0.81 |
| 16 | 0.63 | 16.75 | 0.66 | M24 x 1.5 | 24 | 0.94 | 22.5 | 0.89 |
| 18 | 0.71 | - | - | M27 x 1.5 | 27 | 1.06 | 25.5 | 1.00 |
| 22 | 0.87 | 21.25 | 0.83 | M30 x 1.5 | 30 | 1.18 | 28.5 | 1.12 |
| 25 | 0.98 | - | - | M33 x 1.5 | 33 | 1.30 | 31.5 | 1.24 |
| 28 | 1.10 | 26.75 | 1.05 | M36 x 1.5 | 36 | 1.41 | 34.5 | 1.36 |
| 30 | 1.18 | - | - | M39 x 1.5 | 39 | 1.54 | 37.5 | 1.48 |
| 32 | 1.25 | - | - | M42 x 1.5 | 42 | 1.65 | 40.5 | 1.60 |
| 35 | 1.38 | 33.50 | 1.32 | M45 x 1.5 | 45 | 1.77 | 43.5 | 1.71 |
| 38 | 1.50 | - | - | M48 x 1.5 | 48 | 1.89 | 46.5 | 1.83 |
| 40 | 1.57 | 42.25 | 1.66 | M52 x 1.5 | 52 | 2.04 | 50.5 | 1.99 |
| 45 | 1.77 | - | - | M54 x 2.0 | 54 | 2.12 | 52 | 2.05 |
| - | - | 48.25 | 1.90 | M58 x 2.0 | 58 | 2.28 | 55 | 2.16 |

## British connections

### British standard pipe(BSP)




This BSPT (tapered) connection is similar to the NPT, except that the thread pitches are different in most sizes, and the thread form and O.D.s are close but not the same. Sealing is accomplished by thread distortion. A thread sealant is recommended.




The BSP (parallel) male is similar to the NPSM male except the thread pitches are different in most sizes.

The female swivel BSPP has a tapered nose/Globeseal flareless swivel which seals on the cone seat of the male.

**BSPT/BSPP threads**

| Inch size | Dash size | Nominal thread size | Male thread O.D. inch | | Female thread I.D. inch | |
|---|---|---|---|---|---|---|
| **mm** | **mm** | | **fraction** | **decimal** | **fraction** | **decimal** |
| 1/8 | 02 | 1/8–28 | 3/8 | 0.38 | 11/32 | 0.35 |
| 1/4 | 04 | 1/4–19 | 33/64 | 0.52 | 15/32 | 0.47 |
| 3/8 | 06 | 3/8–19 | 21/32 | 0.65 | 19/32 | 0.60 |
| 1/2 | 08 | 1/2–14 | 13/16 | 0.82 | 3/4 | 0.75 |
| 5/8 | 10 | 5/8–14 | 7/8 | 0.88 | 13/16 | 0.80 |
| 3/4 | 12 | 3/4–14 | 1 1/32 | 1.04 | 31/32 | 0.97 |
| 1 | 16 | 1–11 | 1 5/16 | 1.30 | 1 7/32 | 1.22 |
| 1 1/4 | 20 | 1 1/4–11 | 1 21/32 | 1.65 | 1 9/16 | 1.56 |
| 1 1/2 | 24 | 1 1/2–11 | 1 7/8 | 1.88 | 1 25/32 | 1.79 |
| 2 | 32 | 2–11 | 2 11/32 | 2.35 | 2 1/4 | 2.26 |

*Frequently, the thread size is expressed as a fractional dimension preceded by the letter "G" or the letter "R". The "G" represents a parallel thread and the "R" indicates a tapered thread. For example, BSPP 3/8–19 may be expressed as G 3/8, and BSPT 3/8–19 may be expressed as R3/8.



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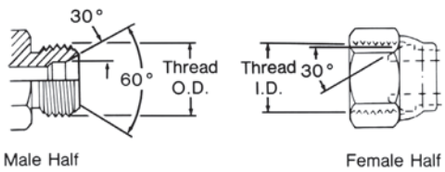
# Japanese connections

## Japanese connections

### JIS 30° male inverted seat, parallel pipe threads

(Threads per JIS B 0202)

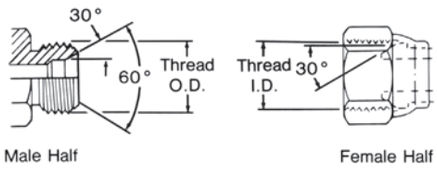



The JIS parallel is similar to the BSPP connection. The JIS parallel thread and the BSPP connection are interchangeable.

| Inch size | Dash size | Nominal thread size (similar to bspp) | Male thread O.D. | | Female thread O.D. | |
|---|---|---|---|---|---|---|
| **mm** | **mm** | | **fract.** | **dec.** | **fract.** | **dec.** |
| 1/4 | 6 (04) | 1/4–19 | 33/64 | 13.2 | 15/32 | 11.9 |
| 3/8 | 9 (06) | 3/8–19 | 21/32 | 16.7 | 19/32 | 15.3 |
| 1/2 | 12 (08) | 1/2–14 | 13/16 | 21.0 | 3/4 | 19.2 |
| 3/4 | 19 (12) | 3/4–14 | 1 1/32 | 26.4 | 31/32 | 24.6 |
| 1 | 25 (16) | 1–11 | 1 5/16 | 33.3 | 1 7/32 | 30.9 |
| 1 1/4 | 32 (20) | 1 1/4–11 | 1 21/32 | 41.9 | 1 9/16 | 39.6 |
| 1 1/2 | 38 (24) | 1 1/2–11 | 1 7/8 | 47.8 | 1 25/32 | 45.5 |
| 2 | 50 (32) | 2–11 | 2 11/32 | 59.7 | 2 1/4 | 57.4 |

### JIS 30° male inverted seat, parallel pipe threads

(Threads per JIS B 0207)

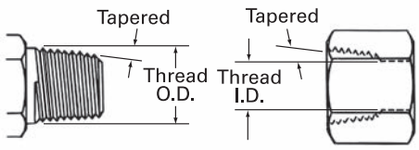



The JIS parallel (metric) is the same as the JIS parallel (PF), except for the thread difference.

| Inch size | Dash size equi-valent | Thread size | Male thread O.D. | | Female thread O.D. | |
|---|---|---|---|---|---|---|
| **mm** | **mm** | | **fract.** | **dec.** | **fract.** | **dec.** |
| 6 | 04 | M14 x 1.5 | 14 | 0.55 | 12.5 | 0.49 |
| 9 | 06 | M18 x 1.5 | 18 | 0.71 | 16.5 | 0.65 |
| 12 | 08 | M22 x 1.5 | 22 | 0.87 | 20.5 | 0.81 |
| 19 | 12 | M30 x 1.5 | 30 | 1.18 | 28.5 | 1.12 |
| 25 | 16 | M33 x 1.5 | 33 | 1.30 | 31.5 | 1.24 |
| 32 | 20 | M42 x 1.5 | 42 | 1.65 | 40.5 | 1.60 |

### JIS Tapered pipe (PT)

(Threads per JIS B 0203)

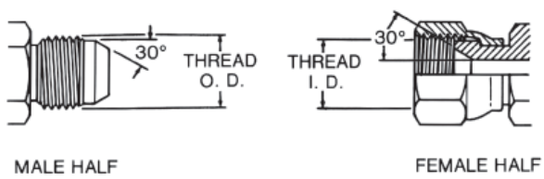



The JIS tapered thread is similar to the BSPT connection in design, appearance and dimensions. The JIS tapered thread and the BSPT connection are interchangeable.

| Inch size | Dash size | Nominal thread size (similar to bspp) | Male thread O.D. inch | | Female thread I.D. inch | |
|---|---|---|---|---|---|---|
| **mm** | **mm** | **-** | **fract.** | **dec.** | **fract.** | **dec.** |
| 1/4 | 6 (04) | 1/4–19 | 33/64 | 13.2 | 15/32 | 11.9 |
| 3/8 | 9 (06) | 3/8–19 | 21/32 | 16.7 | 19/32 | 15.3 |
| 1/2 | 12 (08) | 1/2–14 | 13/16 | 21.0 | 3/4 | 19.2 |
| 3/4 | 19 (12) | 3/4–14 | 1 1/32 | 26.4 | 31/32 | 24.6 |
| 1 | 25 (16) | 1–11 | 1 5/16 | 33.3 | 1 7/32 | 30.9 |
| 1 1/4 | 32 (20) | 1 1/4–11 | 1 21/32 | 41.9 | 1 9/16 | 39.6 |
| 1 1/2 | 38 (24) | 1 1/2–11 | 1 7/8 | 47.8 | 1 25/32 | 45.5 |
| 2 | 50 (32) | 2–11 | 2 11/32 | 59.7 | 2 1/4 | 57.4 |

### JIS 30° female (cone) seat, parallel pipe threads (PT)

(Threads per JIS B 0202)




The Japanese JIS 30° flare is similar to the American SAE 37° flare connection in application as well as sealing principles. However, the flare angle and dimensions are different. The threads are similar to BSPP.

| Inch size | Dash size | Nominal thread size (similar to bspp) | Male thread O.D. inch | | Female thread O.D. inch | |
|---|---|---|---|---|---|---|
| **mm** | **mm** | **-** | **fract.** | **dec.** | **fract.** | **dec.** |
| 1/4 | 6 (04) | 1/4–19 | 33/64 | 13.2 | 15/32 | 11.9 |
| 3/8 | 9 (06) | 3/8–19 | 21/32 | 16.7 | 19/32 | 15.3 |
| 1/2 | 12 (08) | 1/2–14 | 13/16 | 21.0 | 3/4 | 19.2 |
| 3/4 | 19 (12) | 3/4–14 | 1 1/32 | 26.4 | 31/32 | 24.6 |
| 1 | 25 (16) | 1–11 | 1 5/16 | 33.3 | 1 7/32 | 30.9 |
| 1 1/4 | 32 (20) | 1 1/4–11 | 1 21/32 | 41.9 | 1 9/16 | 39.6 |
| 1 1/2 | 38 (24) | 1 1/2–11 | 1 7/8 | 47.8 | 1 25/32 | 45.5 |
| 2 | 50 (32) | 2–11 | 2 11/32 | 59.7 | 2 1/4 | 57.4 |



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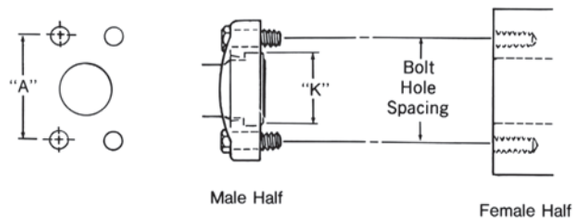
# Japanese connections

### JIS B 8363 4-bolt flange*

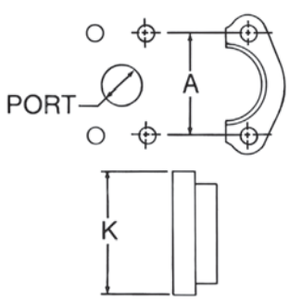



This connection is commonly used in fluid power systems. There are two pressure ratings. Type I (Code 61) is referred to as the "standard" series and Type II (Code 62)is the "6000 psi" series. The design concept for both series is the same, but the bolt hole spacing and flanged head diameters are larger for the higher pressure, Type II connection. Both metric and inch bolts are used. The female (port) is an unthreaded hole with four bolt holes in a rectangular pattern around the port. The male consists of a flanged head, grooved for an O-Ring, and either a captive flange or split flange halves with bolt holes to match the port. The seal takes place on the O-Ring, which is compressed between the flanged head and the flat surface surrounding the port. The threaded bolts hold the connection together.

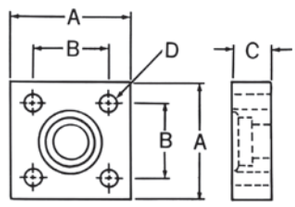
**NOTE:** *JIS B 8363, ISO/DIS 6162, DIN 20066, and SAE J518 are interchangeable, except for bolt sizes.

| Size | Port hole | Bolt dimensions | | Bolt hole spacing "A" | |
|---|---|---|---|---|---|
| | | Type I (Cd.61) | Type II (Cd. 62) | Type I (Cd. 61) | Type II (Cd. 62) |
| mm(in) (dash) | mm(in) | mm(in) | mm(in) | mm(in) | mm(in) |
| 12 (1/2) (08) | 12,7 (0.50) | M8 x1.25 x 30 (5/16–18 x 1-1/4) | M8 x 1.25 x 30 (5/16–18 x 1-1/4) | 38.1 (1.50) | 40.49 (1.57) |
| 19 (3/4) (12) | 19,1 (0.75) | M10 x 1.5 x 30 (3/8–16 x 1-1/4) | M10 x 1.5 x 40 (3/8–16 x 1-1/2) | 47.63 (1.88) | 50.80 (2.00) |
| 25 (1) (16) | 25,4 (1.00) | M10 x 1.5 x 30 (3/8–16 x 1-1/4) | M12 x 1.75 x 45 (7/16–14 x 1-3/4) | 52.37 (2.06) | 57.15 (2.25) |
| 32 (1-1/4) (20) | 31,7 (1.25) | M10 x 1.5 x 40 (7/16–14 x 1-1/2) | M14 x 2 x 45 (1/2–13 x 1-3/4) | 58.72 (2.31) | 66.68 (2.63) |
| 38 (1-1/2) (24) | 38,0 (1.50) | M12 x 1.75 x 40 (1/2–13 x 1-1/2) | M16 x 2 x 55 (5/8–11 x 2-1/4) | 69.85 (2.75) | 79.38 (3.13) |
| 50 (2) (32) | 50,8 (2.00) | M12 x 1.75 x 40 (1/2–13 x 1-1/2) | M20 x 2.5 x 70 (3/4–10 x 2-3/4) | 77.77 (3.06) | 96.82 (3.81) |

| Inch size | Flanged head dia. "K" | | | |
|---|---|---|---|---|
| | Type I bar (Cd.61) | | Type II bar (Cd. 62) | |
| | mm | in | mm | in |
| 1/2 | 30, 18 | 1.19 | 31, 75 | 1.25 |
| 3/4 | 38, 10 | 1.50 | 41, 28 | 1.63 |
| 1 | 44, 45 | 1.75 | 47, 63 | 1.88 |
| 1 1/4 | 50, 80 | 2.00 | 53, 98 | 2.13 |
| 1 1/2 | 60, 33 | 2.38 | 63, 50 | 2.50 |
| 2 | 71, 42 | 2.81 | 79, 38 | 3.13 |



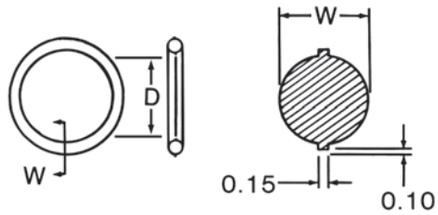

### JIS 210 Kgf/cm2 4-bolt square flange




The JIS 4-bolt square flange connection is similar in concept to the SAE 4-bolt flange connection, except that the JIS bolt pattern is square and the flange itself is different.

| Size mm | Appx. inch size | Bolt size mm (bolt length for long (design) | Dim. "A" mm (inch) | Dim. "B" mm (inch) | Dim. "C" mm (inch) | Bolt hole dia "D" mm (inch) |
|---|---|---|---|---|---|---|
| 12 | 1/2 | M10 x 1.5 x 55 (80) | 63 (2.48) | 40 (1.57) | 22 (0.87) | 11 (0.43) |
| 19 | 3/4 | M10 x 1.5 x 55 (80) | 68 (2.67) | 45 (1.77) | 22 (0.87) | 11 (0.43) |
| 25 | 1 | M12 x 1.75 x 70 (100) | 80 (3.15) | 53 (2.09) | 28 (1.10) | 13 (0.51) |
| 32 | 1 1/4 | M12 x 1.75 x 70 (100) | 90 (3.54) | 63 (2.48) | 28 (1.10) | 13 (0.51) |
| 38 | 1 1/2 | M16 x 2.0 x 90 (130) | 100 (3.94) | 70 (2.76) | 36 (1.42) | 18 (0.71) |
| 50 | 2 | M16 x 2.0 x 90 (130) | 112 ( 4.41) | 80 (3.15) | 36 (1.42) | 18 (0.71) |

### JIS 210 Kgf/cm2 O-Ring




| Nominal size mm | Dim."D"mm | Dim."W"mm |
|---|---|---|
| 12 | 24.4 ± 0.15 | 3.1 ± 0.1 |
| 19 | 29.4 ± 0.15 | 3.1 ± 0.1 |
| 25 | 34.4 ± 0.15 | 3.1 ± 0.1 |
| 32 | 39.4 ± 0.15 | 3.1 ± 0.1 |
| 38 | 49.4 ± 0.15 | 3.1 ± 0.1 |
| 50 | 59.4 ± 0.15 | 3.1 ± 0.1 |



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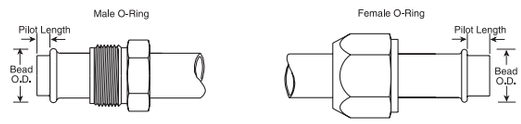
# O-Ring pilot thread sizes

This connection is common to air conditioning systems, both in vehicle and commercial applications. Both the male and female halves of the connections have a pilot, either long or short. The seal takes place by compressing an O-ring adjacent to the bead of the tube. The threads hold the connection together mechanically.

| | | Male thread | | | Female thread | | |
|---|---|---|---|---|---|---|---|
| Inch size | Dash size | O.D. (inch) nominal thread | O.D. (inch) fraction | O.D. (inch) decimal | I.D. (inch) nominal thread | I.D. (inch) fraction | I.D. (inch) decimal |
| 3/8 | 06 | 5/8 - 18 | 5/8 | 0.62 | 5/8 - 18 | 9/16 | 0.57 |
| 1/2 | 08 | 3/4 - 18 | 3/4 | 0.75 | 3/4 - 16 | 11/16 | 0.69 |
| 5/8 | 10 | 7/8 - 18 | 7/8 | 0.87 | 7/8 - 14 | 13/16 | 0.81 |
| 3/4 | 12 | 1 1/16 -16 | 1 1/16 | 1.06 | 1 1/16 - 14 | 1 | 0.99 |

| | | Long pilot | | Short pilot | |
|---|---|---|---|---|---|
| Inch size | | Bead O.D.(inch) | Pilot length | Bead O.D. (inch) | Pilot length |
| 3/8 | 06 | 0.52 | 0.28 | 0.52 | 0.19 |
| 1/2 | 08 | 0.64 | 0.39 | 0.64 | 0.19 |
| 5/8 | 10 | 0.77 | 0.39 | 0.77 | 0.19 |
| 3/4 | 12 | 0.91 | 0.39 | 0.91 | 0.19 |



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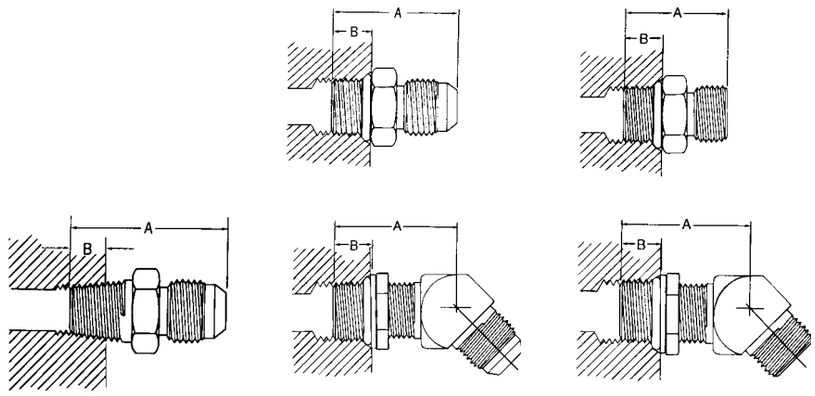
## Thread engagement

Dimensions may vary due to tolerance conditions. Listed below are the thread engagement dimensions (B) which must be taken into consideration when making connection with ports or appropriate female adapters. The "B" dimension must be subtracted from the overall length (A) to insure proper connection.




| Dash size | Male pipe | | SAE O-ring boss SAE J1926 with 37° flare J514 | | SAE O-ring boss SAE J1926 with ORS J1453 | |
|---|---|---|---|---|---|---|
| mm | Straight and angled dimension "B" | | Straight and adjustable dimension "B" | | Straight and adjustable dimension "B" | |
| | mm | in | mm | in | mm | in |
| –02 | 6,4 | 0.25 | – | – | – | – |
| –04 | 9,7 | 0.38 | 9,1 | 0.36 | 10,9 | 0.43 |
| –05 | – | – | 9,1 | 0.36 | 10,9 | 0.43 |
| –06 | 9,7 | 0.38 | 9,1 | 0.39 | 11,9 | 0.47 |
| –08 | 12,7 | 0.50 | 10,9 | 0.43 | 14,0 | 0.55 |
| –10 | – | – | 12,7 | 0.50 | 16,0 | 0.63 |
| –12 | 15,7 | 0.62 | 15,0 | 0.59 | 18,5 | 0.73 |
| –14 | – | – | 15,0 | 0.59 | – | – |
| –16 | 17,5 | 0.69 | 15,0 | 0.59 | 18,5 | 0.73 |
| –20 | 17,5 | 0.69 | 15,0 | 0.59 | 18,5 | 0.73 |
| –24 | 17,5 | 0.69 | 15,0 | 0.59 | 18,5 | 0.73 |
| –32 | 19,1 | 0.75 | 15,0 | 0.59 | – | – |

**Allowable bulkhead thickness:**

| For ORS | | | | | |
|---|---|---|---|---|---|
| Dash size | Hole diameter | ORS bulkhead thickness | | | |
| | | Min | | Max | |
| | in | mm | in | mm | in |
| –04 | 0.575 +.015/–.000 | 5,1 | 0.20 | 12,7 | 0.50 |
| –06 | 0.700 +.015/–.000 | 5,1 | 0.20 | 15,0 | 0.59 |
| –08 | 0.825 +.015/–.000 | 5,6 | 0.22 | 15,0 | 0.59 |
| –10 | 1.015 +.015/–.000 | 5,8 | 0.23 | 15,0 | 0.59 |
| –12 | 1.200 +.015/–.000 | 6,4 | 0.25 | 15,0 | 0.59 |
| –16 | 1.450 +.015/–.000 | 6,4 | 0.25 | 15,2 | 0.60 |
| –20 | 1.715 +.015/–.000 | 6,4 | 0.25 | 15,2 | 0.60 |
| –24 | 2.030 +.015/–.000 | 6,4 | 0.25 | 15,2 | 0.60 |

| For 37° Flare | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dash size | Hole diameter | 37° bulkhead thickness straights | | | | 37° bulkhead thickness shapes | | | |
| | | Min | | Max | | Min | | Max | |
| | in | mm | in | mm | in | mm | in | mm | in |
| –03 | 0.391 +.016/–.000 | 1,3 | 0.05 | 10,4 | 0.41 | 3,3 | 0.13 | 6,4 | 0.25 |
| –04 | 0.453 +.016/–.000 | 1,3 | 0.05 | 10,4 | 0.41 | 3,3 | 0.13 | 7,1 | 0.28 |
| –05 | 0.516 +.016/–.000 | 1,3 | 0.05 | 10,4 | 0.41 | 3,3 | 0.13 | 7,1 | 0.28 |
| –06 | 0.578 +.016/–.000 | 1,3 | 0.05 | 11,2 | 0.44 | 3,3 | 0.13 | 7,6 | 0.30 |
| –08 | 0.766 +.016/–.000 | 1,3 | 0.05 | 11,2 | 0.44 | 4,1 | 0.16 | 8,6 | 0.34 |
| –10 | 0.891 +.016/–.000 | 1,3 | 0.05 | 11,9 | 0.47 | 4,1 | 0.16 | 9,1 | 0.36 |
| –12 | 1.076 +.016/–.000 | 1,3 | 0.05 | 11,9 | 0.47 | 4,1 | 0.16 | 9,7 | 0.38 |
| –16 | 1.328 +.016/–.000 | 1,3 | 0.05 | 11,9 | 0.47 | 4,1 | 0.16 | 9,7 | 0.38 |
| –20 | 1.656 +.031/–.000 | 1,3 | 0.05 | 11,9 | 0.47 | 4,1 | 0.16 | 9,7 | 0.38 |
| –24 | 1.906 +.031/–.000 | 1,3 | 0.05 | 11,9 | 0.47 | 4,1 | 0.16 | 9,7 | 0.38 |



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## Conversion table: Inch/Millimeter

Multiply inch x 25.4 =mm

| Inches | Millimeters | |
|---|---|---|
| Fract. | Dec. | Dec. |
| 1/64 | 0.016 | 0.397 |
| 1/32 | 0.031 | 0.794 |
| 3/64 | 0.047 | 1.191 |
| 1/16 | 0.063 | 1.588 |
| 5/64 | 0.078 | 1.984 |
| 3/32 | 0.094 | 2.381 |
| 7/64 | 0.109 | 2.778 |
| 1/8 | 0.125 | 3.175 |
| 9/64 | 0.141 | 3.572 |
| 5/32 | 0.156 | 3.969 |
| 11/64 | 0.172 | 4.366 |
| 3/16 | 0.188 | 4.763 |
| 13/64 | 0.203 | 5.159 |
| 7/32 | 0.219 | 5.556 |
| 15/64 | 0.234 | 5.953 |
| 1/4 | 0.250 | 6.350 |

| Inches | Millimeters | |
|---|---|---|
| Fract. | Dec. | Dec. |
| 17/64 | 0.266 | 6.747 |
| 9/32 | 0.281 | 7.144 |
| 19/64 | 0.297 | 7.541 |
| 5/16 | 0.313 | 7.938 |
| 21/64 | 0.328 | 8.334 |
| 11/32 | 0.344 | 8.731 |
| 23/64 | 0.359 | 9.128 |
| 3/8 | 0.375 | 9.525 |
| 25/64 | 0.391 | 9.922 |
| 13/32 | 0.406 | 10.319 |
| 27/64 | 0.422 | 10.716 |
| 7/16 | 0.438 | 11.113 |
| 29/64 | 0.453 | 11.509 |
| 15/32 | 0.469 | 11.906 |
| 31/64 | 0.484 | 12.303 |
| 1/2 | 0.500 | 12.700 |

| Inches | Millimeters | |
|---|---|---|
| Fract. | Dec. | Dec. |
| 33/64 | 0.516 | 13.097 |
| 17/32 | 0.531 | 13.494 |
| 35/64 | 0.547 | 13.891 |
| 9/16 | 0.563 | 14.288 |
| 37/64 | 0.578 | 14.684 |
| 19/32 | 0.594 | 15.081 |
| 39/64 | 0.609 | 15.478 |
| 5/8 | 0.625 | 15.875 |
| 41/64 | 0.641 | 16.272 |
| 21/32 | 0.656 | 16.669 |
| 43/64 | 0.672 | 17.066 |
| 11/16 | 0.688 | 17.463 |
| 45/64 | 0.703 | 17.859 |
| 23/32 | 0.719 | 18.256 |
| 47/64 | 0.734 | 18.653 |
| 3/4 | 0.750 | 19.050 |

| Inches | Millimeters | |
|---|---|---|
| Fract. | Dec. | Dec. |
| 49/64 | 0.766 | 19.447 |
| 25/32 | 0.781 | 19.844 |
| 51/64 | 0.797 | 20.241 |
| 13/16 | 0.813 | 20.638 |
| 53/64 | 0.828 | 21.034 |
| 27/32 | 0.844 | 21.431 |
| 55/64 | 0.859 | 21.828 |
| 7/8 | 0.875 | 22.225 |
| 57/64 | 0.891 | 22.622 |
| 29/32 | 0.906 | 23.019 |
| 59/64 | 0.922 | 23.416 |
| 15/16 | 0.938 | 23.813 |
| 61/64 | 0.953 | 24.209 |
| 31/32 | 0.969 | 24.606 |
| 63/64 | 0.984 | 25.003 |
| 1 | 1.000 | 25.400 |

## Conversion table: Pressure

(Per SAE J517 Section A)

| Mpa | Bar | PSI |
|---|---|---|
| 0.25 | 2.5 | 35 |
| 0.3 | 3 | 45 |
| 0.35 | 3.5 | 50 |
| 0.4 | 4 | 56 |
| 0.4 | 4 | 62 |
| 0.5 | 5 | 70 |
| 0.6 | 6 | 90 |
| 0.7 | 7 | 100 |
| 0.8 | 8 | 112 |
| 0.85 | 8.5 | 125 |
| 1 | 10 | 140 |
| 1.05 | 10.5 | 150 |
| 1.25 | 12.5 | 180 |
| 1.4 | 14 | 200 |
| 1.6 | 16 | 225 |
| 1.7 | 17 | 250 |
| 2.1 | 21 | 300 |
| 2.4 | 24 | 350 |
| 2.6 | 26 | 375 |
| 2.8 | 28 | 400 |
| 3.5 | 35 | 500 |
| 3.9 | 39 | 565 |

| Mpa | Bar | PSI |
|---|---|---|
| 4.2 | 42 | 600 |
| 4.3 | 43 | 625 |
| 4.9 | 49 | 700 |
| 5 | 50 | 725 |
| 5.2 | 52 | 750 |
| 5.6 | 56 | 800 |
| 6.1 | 61 | 875 |
| 7 | 70 | 1000 |
| 7.8 | 78 | 1125 |
| 8.4 | 84 | 1200 |
| 8.7 | 87 | 1250 |
| 9.8 | 98 | 1400 |
| 10 | 100 | 1450 |
| 10.5 | 105 | 1500 |
| 11.2 | 112 | 1600 |
| 11.3 | 113 | 1625 |
| 12.2 | 122 | 1750 |
| 14 | 140 | 2000 |
| 15.7 | 157 | 2250 |
| 16.8 | 168 | 2400 |
| 17.5 | 175 | 2500 |
| 19.2 | 192 | 2750 |

| Mpa | Bar | PSI |
|---|---|---|
| 20 | 200 | 2900 |
| 21 | 210 | 3000 |
| 22.4 | 224 | 3200 |
| 22.7 | 227 | 3250 |
| 24.5 | 245 | 3500 |
| 28 | 280 | 4000 |
| 29.7 | 297 | 4250 |
| 31.5 | 315 | 4500 |
| 33.5 | 335 | 4800 |
| 35 | 350 | 5000 |
| 38.5 | 385 | 5500 |
| 40 | 400 | 5800 |
| 42 | 420 | 6000 |
| 43.5 | 435 | 6250 |
| 45.5 | 455 | 6500 |
| 49 | 490 | 7000 |
| 52.5 | 525 | 7500 |
| 56 | 560 | 8000 |
| 59.5 | 595 | 8500 |
| 61 | 610 | 8750 |
| 63 | 630 | 9000 |
| 70 | 700 | 10000 |

| Mpa | Bar | PSI |
|---|---|---|
| 77 | 770 | 11000 |
| 78 | 780 | 11250 |
| 80 | 800 | 11600 |
| 84.0 | 840 | 12000 |
| 87 | 870 | 12500 |
| 98 | 980 | 14000 |
| 112 | 1120 | 16000 |
| 119 | 1190 | 17000 |
| 122 | 1220 | 17500 |
| 140 | 1400 | 20000 |
| 157 | 1570 | 22500 |
| 160 | 1600 | 23200 |
| 168 | 1680 | 24000 |
| 175 | 1750 | 25000 |
| 210 | 2100 | 30000 |
| 245 | 2450 | 35000 |
| 280 | 2800 | 40000 |
| 315 | 3150 | 45000 |
| 350 | 3500 | 50000 |

A new method for calculating the equivalent metric conversion to Mpa from psi was utilized. This method provides an extremely easy and consistent method of conversion to arrive at a rounded metric units using 7 Mpa for each 1000 psi. The resulting Mpa pressure in never more than 1.7% higher that the mathematically correct Mpa unit when the pressure in higher than 250 psi. All operating pressures of SAE J517 hoses are above 250 psi except for most of 100R4 and the

76mm (-48) and larger sizes of 100R5. Therefore all files of previous test results should not be compromised



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# Recommended parallel connection assembly torque

Danfoss recommends that a torque wrench be used to assure proper fitting assembly of these connections.

The values listed are for steel connections.
Contact Danfoss for torque values for other materials.

## Straight thread O-Ring boss low pressure with 37° (SAEJ514)

| Dash size | Thread size (inches) | Jam nut or straight fitting torque lb.-ft. | Jam nut or straight fitting torque newton meters |
|---|---|---|---|
| –03 | 3/8-24 | 8-9 | 12-13 |
| –04 | 7/16-20 | 13-15 | 18-20 |
| –05 | 1/2-20 | 14-15 | 19-21 |
| –06 | 9/16-18 | 23-24 | 32-33 |
| –08 | 3/4-16 | 40-43 | 55-57 |
| –10 | 7/8-14 | 43-48 | 59-64 |
| –12 | 1 1/16-12 | 68-75 | 93-101 |
| –14 | 1 3/16-12 | 83-90 | 113-122 |
| –16 | 1 5/16-12 | 112-123 | 152-166 |
| –20 | 1 5/8-12 | 146-161 | 198-218 |
| –24 | 1 7/8-12 | 154-170 | 209-230 |
| –32 | 2 1/2-12 | 218-240 | 296-325 |

## Straight thread O-Ring boss high pressure with ORS (J1453)

| Dash size | Thread size (inches) | Jam nut or straight fitting torque lb.-ft. | Jam nut or straight fitting torque newton meters |
|---|---|---|---|
| –03 | 3/8-24 | 8-10 | 11-13 |
| –04 | 7/16-20 | 14-16 | 20-22 |
| –05 | 1/2-20 | 18-20 | 24-27 |
| –06 | 9/16-18 | 24-26 | 33-35 |
| –08 | 3/4-16 | 50-60 | 68-78 |
| –10 | 7/8-14 | 72-80 | 98-110 |
| –12 | 1 1/16-12 | 125-135 | 170-183 |
| –14 | 1 3/16-12 | 160-180 | 215-245 |
| –16 | 1 5/16-12 | 200-220 | 270-300 |
| –20 | 1 5/8-12 | 210-280 | 285-380 |
| –24 | 1 7/8-12 | 270-360 | 370-490 |

## ORS

| Dash size | Thread size (inches) | Swivel nut torque lb.-ft. | Swivel nut torque newton meters |
|---|---|---|---|
| –04 | 9/16-18 | 10-12 | 14-16 |
| –06 | 11/16-16 | 18-20 | 24-27 |
| –08 | 13/16-16 | 32-35 | 43-47 |
| –10 | 1-14 | 46-50 | 62-68 |
| –12 | 1 3/16-12 | 65-70 | 88-95 |
| –16 | 1 7/16-12 | 92-100 | 125-136 |
| –20 | 1 11/16-12 | 125-140 | 170-190 |
| –24 | 2-12 | 150-165 | 204-224 |

## SAE 37° (JIC)

| Dash size | Thread size (inches) | Swivel nut torque lb.-ft. | Swivel nut torque newton meters | Hex turns* |
|---|---|---|---|---|
| –04 | 7/16-20 | 11-12 | 15-16 | 1 1/2 - 1 3/4 |
| –05 | 1/2-20 | 15-16 | 20-22 | 1 1/2 - 1 3/4 |
| –06 | 9/16-18 | 18-20 | 24-28 | 1 - 1 1/2 |
| –08 | 3/4-16 | 38-42 | 52-58 | 1 1/4 - 1 3/4 |
| –10 | 7/8-14 | 57-62 | 77-85 | 1 1/4 - 1 3/4 |
| –12 | 1 1/16-12 | 79-87 | 108-119 | 1 - 1 1/2 |
| –16 | 1 5/16-12 | 108-113 | 148-154 | 3/4 - 1 |
| –20 | 1 5/8-12 | 127-133 | 173-182 | 1/2 - 3/4 |
| –24 | 1 7/8-12 | 158-167 | 216-227 | 3/4 |
| –32 | 2 1/2-12 | 245-258 | 334-352 | 1 |

* Additional hex turns past hand tight



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# Recommended parallel connection assembly torque (cont.)

Danfoss recommends that a torque wrench be used to assure proper fitting assembly of these connections.

The values listed are for steel connections.
Contact Danfoss for torque values for other materials.

## Metric

| Thread size | Straight adapter or locknut torque | |
|---|---|---|
| mm | lb.-ft. | Newton meters |
| M10 x 1 | 13-15 | 18-20 |
| M12 x 1.5 | 15-19 | 20-25 |
| M14 x 1.5 | 19-23 | 25-30 |
| M16 x 1.5 | 33-40 | 45-55 |
| M18 x 1.5 | 37-44 | 50-60 |
| M20 x 1.5 | 52-66 | 70-90 |
| M22 x 1.5 | 55-70 | 75-95 |
| M26 x 1.5 | 81-96 | 110-130 |
| M27 x 2 | 96-111 | 130-150 |
| M33 x 2 | 162-184 | 220-250 |
| M42 x 2 | 170-192 | 230-260 |
| M48 x 2 | 258-347 | 350-470 |

## DKO, light series DIN 3865

| | | DKO, light series | | |
|---|---|---|---|---|
| DN | O.D. | Thread | SW torque definition 8434-1 | Montage [Nm[ +10%] |
| 5 | 6 | M12X1,5 | 14 | 20 |
| 6 | 8 | M14X1,5 | 17 | 25 |
| 8 | 10 | M16X1,5 | 19 | 45 |
| 10 | 12 | M18X1,5 | 22 | 50 |
| 12 | 15 | M22X1,5 | 27 | 60 |
| 16 | 18 | M26X1,5 | 32 | 70 |
| 20 | 22 | M30X1,5 | 36 | 130 |
| 25 | 28 | M36X1,5 | 41 | 180 |
| 32 | 35 | M45X1,5 | 50 | 300 |
| 40 | 42 | M52X1,5 | 60 | 320 |

## BSPP

| Nominal thread size | Straight adapter or locknut torque | |
|---|---|---|
| **inches**** | **lb.-ft.** | **Newton meters** |
| G 1/8-28 | 13-15 | 18-20 |
| G 1/4-19 | 19-23 | 25-30 |
| G 3/8-19 | 33-40 | 45-55 |
| G 1/2-14 | 55-70 | 75-95 |
| G 3/4-14 | 103-118 | 140-160 |
| G 1-11 | 162-184 | 220-250 |
| G 1 1/4-11 | 170-192 | 230-260 |
| G 1 1/2-11 | 258-347 | 350-470 |

**"G" denotes parallel threads, other than ISO 6149. (Port connection only)

## DKO, heavy series DIN 3865

| | | DKO, heavy series | | |
|---|---|---|---|---|
| DN | O.D. | Thread | SW torque definition 8434-1 | Montage [Nm[ +10%] |
| | 6 | M14X1,5 | 17 | 20 |
| 5 | 8 | M16X1,5 | 19 | 35 |
| 6 | 10 | M18X1,5 | 22 | 50 |
| 8 | 12 | M20X1,5 | 24 | 65 |
| 10 | 14 | M22X1,5 | 27 | 70 |
| 12 | 16 | M24X1,5 | 30 | 85 |
| 16 | 20 | M30X2 | 36 | 135 |
| 20 | 25 | M36X2 | 41 (46) | 170 |
| 25 | 30 | M42X2 | 50 | 280 |
| 32 | 38 | M52X2 | 60 | 320 |



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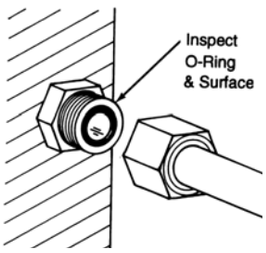
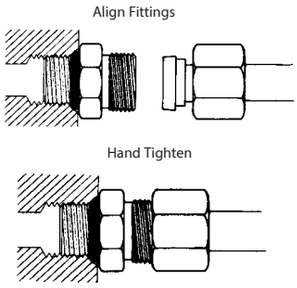
# ORS Tube fittings, Pipe threads and SAE 37° (JIC) Flare type tube fittings

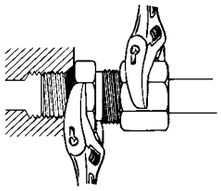
## Assembly Instruction for ORS tube fittings




1. Inspect sealing surfaces and O-Ring groove for damage or foreign material. Check the O-Ring to insure that it is properly seated in the O-Ring groove.
2. Lubricate threads with heavy lubricant such as part number 222070 Lube.
3. Align the ORS tube fitting to the flat sealing connections and tighten the nut by hand. The nut should tighten easily by hand if properly aligned.



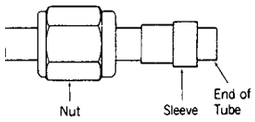

4. Complete the assembly by wrench tightening the nut to the recommended torque value on page 376.



## Assembly Instructions for Standard SAE 37° Flare type tube fitting

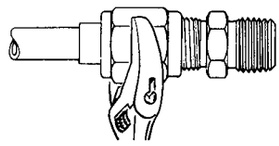
Use SAE J524 or SAE J525 tubing for best bending and flaring results.

1. Cut the tubing with a tube cutter. If a fine tooth hacksaw is used, make sure cut-off is square; remove burrs with deburring tool, emery paper or fine file. Clean all dirt and grit from the I.D. and O.D. of the tube.
2. Place the nut and then the sleeve onto tube. The threaded end of nut and flared end of sleeve must face the end of tube.



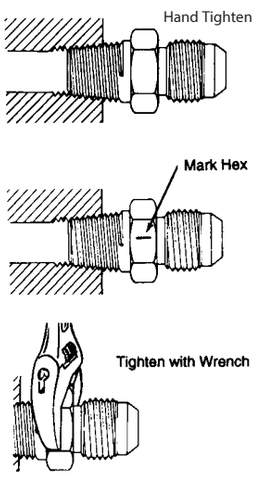

3. Flare the tube end with a flaring tool to provide a 37° flare. Check the flare for correct diameter, excessive thin out and burrs or cracks.
4. Lubricate all mating surfaces of nut, ferrule and body with a heavy lubricant such as part number 222070 Lube.
5. Assemble the nut and sleeve to body. Turn the nut hand tight then wrench tighten for a leakproof joint. See page 376, torque values, for assembly using a torque wrench.

The Danfoss standard 37° flare fitting is easy to disassemble and may be reassembled repeatedly.



## Assembly Instructions for Pipe threads

1. Assemble connection hand tight.
2. Mark male and female.
3. Rotate male; 1 1/2 turns if using thread sealant. 2 turns if not using thread sealant.



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# Assembly instruction tips

**Terms**

- Skive—Removal of the cover material exposing the reinforcement prior to fitting assembly.
- Dash Size—The hose or fitting size expressed in 1/16 of an inch.The numerator of a fraction whose denominator is 16. Example: –8 or –08 is 8/16" = 1/2".
- Nipple—The part of a hose fitting that goes into the hose tube.
- Socket—The part of a hose fitting that goes over the hose cover or reinforcement.
- Mandrel—A round, properly sized, steel bar used for support during assembly of the fitting or skiving the hose cover.
- Annular Rings—A series of concentric rings inside the socket.

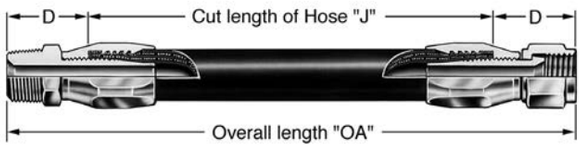
**Reusable fitting tips to remember for easy assembly**

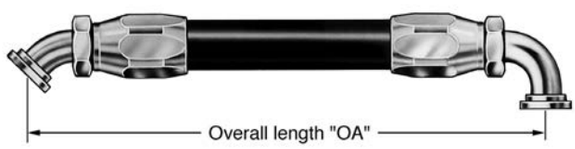
- Part numbers and dash sizes are indicated on fitting sockets.
- It is essential the fitting be mated with a compatible hose style with the same dash size.
- Reusable fittings that have a notch in the socket serve as a reference for the cover skiving length.
- Familiarize yourself with the assembly instructions before you start to make an assembly.
- For hoses that require skiving, be sure to skive the hose to the proper length and down to the wire reinforcement.
- Use Aeroquip 222070 hose assembly lube liberally on both the inside of the hose and on the fitting nipple. (Check for compatibility.)
- Always cut hose square
- For volume production of hose assemblies, use Danfoss Assembly Equipment.

**Cutting the hose**

1. To determine the "J" length (cut length of hose) from "OA" (overall length) deduct "D" dimensions of both end fittings. Consult fitting information pages for "D" dimensions. For hose assemblies with SOCKETLESS® fittings, add 1/2" to "J" length.

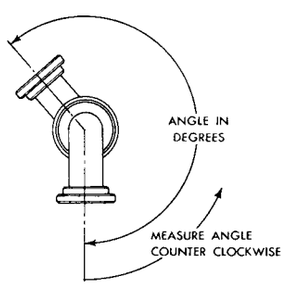
   Tip: If the old Aeroquip® assembly was the right length, simply remove the hose fittings and measure the hose.
2. Cut the hose square.
3. Clean the hose bore.






**Phase angle (offset)**

When making double elbow assemblies, the following steps should be followed to obtain the desired angle between elbows. Tighten both elbows to maximum allowable gap between socket and nipple hex. Start to position for relative angle between elbows. Finish assembly by adjusting both elbows. Backing off to get desired angle should be avoided.



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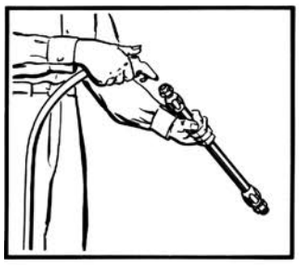
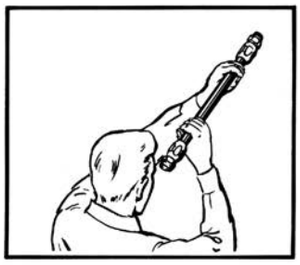
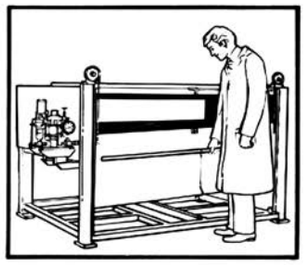
# Cleaning, inspection, testing and storage



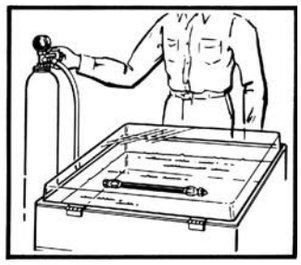
Clean



Inspect



Proof test - hydrostatic



Proof test - pneumatic

**Maintenance**

Hose assemblies in operation should be inspected frequently for leakage, kinking, abrasion, corrosion or any other signs of wear or damage. Worn or damaged hose assemblies should be replaced immediately.

**Clean**

At minimum a hose assembly should be blown out with clean compressed air. Danfoss recommends using the **Danfoss Projectile Cleaning System** (FT1455 Series).

Assemblies may be rinsed out with mineral spirits if the tube stock is compatible with oil, otherwise hot water at +150°F max. may be used.

**Inspect**

Examine hose assembly internally for cut or bulged tube, obstructions, and cleanliness.

Check for proper gap between nut and socket or hex and socket. Nuts should swivel freely. Cap the ends of the hose with plastic covers to keep clean.

**Proof test – hydrostatic**

The hose assembly should be hydrostatically tested at twice the recommended working pressure of the hose.

Test pressure should be held for not more than one minute and not less than 30 seconds. When test pressure is reached, visually inspect hose assembly for: a) Any leaks or signs of weakness. b) Any movement of the hose fitting in relation to the hose. Any of these defects are cause for rejection.

(See Assembly Equipment Section for Danfoss Proof Test Stands.)

**Proof test – pneumatic**

Hose assemblies intended for gas or air service should be tested with air or nitrogen at 100 psi with the assembly immersed in water. Random bubbles may appear over the hose and fitting area when assembly is first pressurized. This should not be construed as a defect. However, if the bubbles persist in forming at a steady rate at any particular point on the hose, the assembly should be rejected.

Caution: Testing should be conducted in approved test stands with adequate guards to protect the operator.

**Storage and handling**

Hose should be stored in a dark, dry atmosphere away from electrical equipment, and the temperature should not exceed +90°F. Storage in the original shipping container is preferred.



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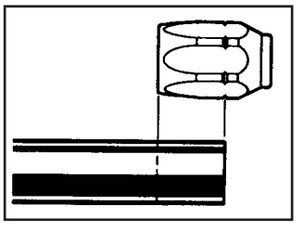
# Hose and reusable fittings

## Standard reusable fittings with Hi-Pac and two wire braid hose

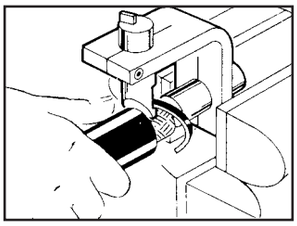
**FC510**



**Step 1**

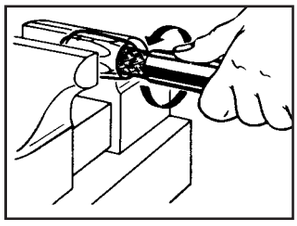
Cut hose to length required using a cut-off wheel. Clean hose bore.

Hose must be stripped of its rubber cover before inserting in socket. Locate skiving point by putting hose end next to socket as shown. Measure from hose end of socket to notch on socket.



**Skive Tool**

Use the correct size FT1229 hose cover skiving tool. Mount the tool in a vise. Push the hose over the mandrel. Rotate the hose clock-wise until it bottoms or secure hose in a vise and attach FT1279 auger to the skive tool. Insert mandrel into the hose and rotate clockwise until it bottoms.



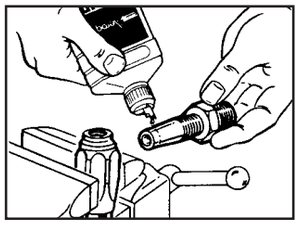
**Step 2**

Put socket in vise.

Screw hose into socket counterclockwise until it bottoms.

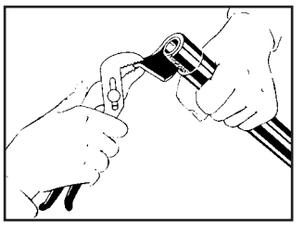
When assembling long lengths of hose, it may be preferred to put hose in vise just tight enough to prevent from turning, and screw socket onto the hose counterclockwise until it bottoms.

**NOTE: Sockets for hose fittings in the –16, –24 and –32 sizes are furnished with internal annular grooves in place of helical grooves (all FC310 and FC510 hose sockets are annular grooved). Install socket by pushing hose into socket with a back and forth rocking and twisting motion until hose bottoms on shoulder of socket.**



**Step 3**

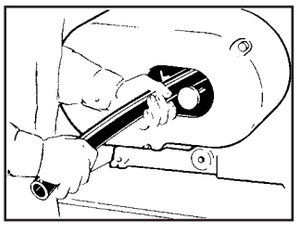
Lubricate nipple threads and inside of hose liberally. Use heavy oil or Danfoss 222070 hose assembly lube.



**Step 1A**

**Skive Hose**

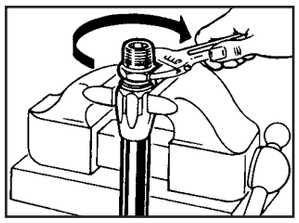
By Hand: Cut rubber cover around down to wire reinforcement. Slit lengthwise. Raise flap and pull off with pliers. Clean excess rubber off wire reinforcement with wire brush or soft wire wheel. Do not fray or flare wire reinforcement when brushing.



**Machine**

Use the S1102 cut-off and skiving machine. Consult the owners manual. Select the correct mandrel. Turn on the machine. Put the hose over the mandrel and rotate.

**NOTE: When skiving, remove the rubber cover until the wire reinforcement is exposed around the circumference of the hose.**



**Step 4**

Screw nipple clockwise into socket and hose.

Leave 1/32" to 1/16" clearance be-tween nipple hex and socket.

Recommendations for cleaning, inspection and testing are summarized on page 380. Disassemble in reverse order.



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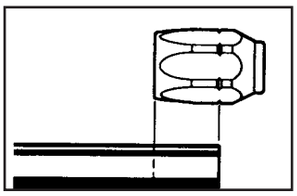
# Hose and reusable fittings

## Standard reusable fittings with four spiral wire hose

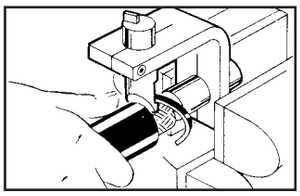
**GH493, FC736**



### Step 1

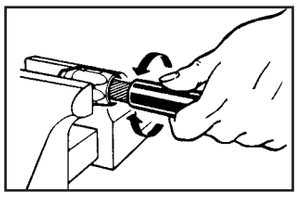
Cut hose to length required using a cut-off wheel. Clean hose bore.

Hose must be stripped of its rubber cover before inserting into socket. Locate skiving point by putting hose end next to socket as shown. Measure from hose end of socket to notch on socket.



### Skive Tool

Use the correct size Danfoss FT1229 hose cover skiving tool. Mount the tool in a vise. Push the hose over the mandrel. Rotate the hose clockwise until it bottoms or secure hose in a vise and attach FT1279 auger to the skive tool. Insert mandrel into the hose and rotate clockwise until it bottoms.

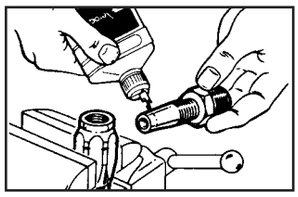


### Step 2

Sockets for hose fittings are furnished with internal annular grooved design. Install socket by pushing hose into socket with a back and forth rocking and clockwise twisting motion until hose bottoms on shoulder of socket.

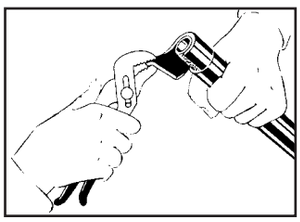
An alternate method is to insert the hose in a vise. Install socket by pushing onto the hose with a back and forth rocking and clockwise twisting motion until the hose bottoms on the shoulder of socket.

A rawhide hammer or similar tool may be used to tap the socket onto the hose but avoid damage to internal socket threads. Be sure not to damage hose cover or wire reinforcement.



### Step 3

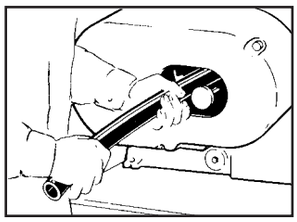
Liberally lubricate nipple threads and inside of hose. Use heavy weight oil or Aeroquip 222070 hose assembly lube.



### Step 1A

**Skive hose by hand**

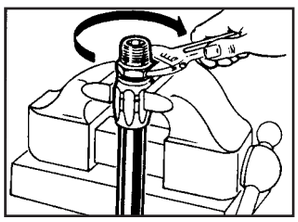
Cut rubber cover around down to wire reinforcement with a knife. Slit lengthwise. Raise flap and pull off with pliers. Clean excess rubber off wire reinforcement with wire brush or soft wire wheel. Do not fray or flare wire reinforcement when brushing.



### Machine

Use the Danfoss S1102 cut-off and skiving machine. Consult the owners manual. Select the correct mandrel. Turn on the machine. Put the hose over the mandrel and rotate counterclockwise.

**NOTE: when skiving, remove the rubber cover until the wire reinforcement is exposed around the circumference of the hose.**



### Step 4

Screw nipple clockwise into socket and hose. Leave a 1/32" to 1/16" clearance between nipple hex and socket.

Recommendations for cleaning, inspection and testing are summarized on page 380. Disassemble in reverse order.



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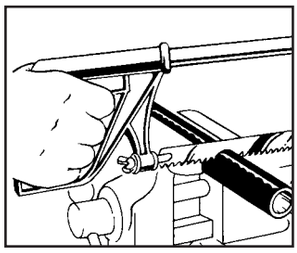
# Hose and reusable fittings

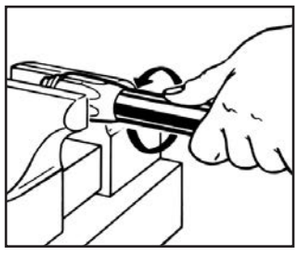
## Thru-the-cover style reusable fittings with hose

**GH681, GH781, EC115, EC215, GH663, GH793**



**Step 1**

Cut hose to length required using a cut-off machine.
Clean hose bore.

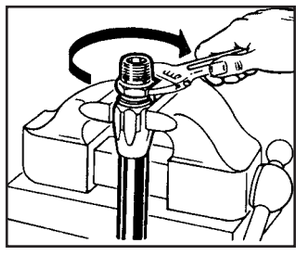


**Step 2**

Liberally lubricate hose cover with Aeroquip® 222070 hose assembly lube.

Place socket in vise and turn hose into socket counterclockwise until it bottoms.

When assembling long lengths of hose, it may be preferred to put hose in vise just tight enough to prevent from turning, and screw socket onto the hose counterclockwise until it bottoms.



**Step 3**

Liberally lubricate nipple threads and inside of hose. Use heavy weight oil or Aeroquip® 222070 hose assembly lube.

**Step 4**

Screw nipple clockwise into socket and hose. Leave 1/32" to 1/16" clearance between nipple hex and socket.

Recommendations for cleaning, inspection and testing are summarized on page 380.
Disassemble in reverse order.



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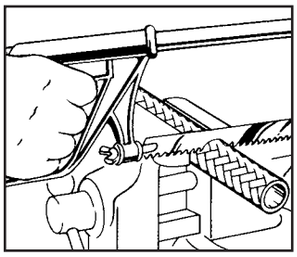
# Hose and reusable fittings

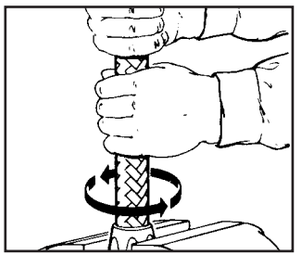
## Mandrel type fittings— standard reusable fittings with single wire braid, multiple textile braid, hydraulic, LPG hose, engine and air brake hose

**FC234, FC300, FC321, FC350, FC355, 1503, 2580, 2651**



**Step 1**

Cut hose square to length required using a cut-off wheel. Clean hose bore.

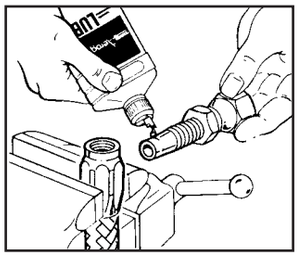


**Step 2**

Put socket in vise. Screw hose counterclockwise into socket until hose bottoms. Back off 1/4 turn.

When assembling long lengths of hose, it may be preferred to put hose in vise just tight enough to prevent from turning, and screw socket into the hose counterclockwise until it bottoms. Back off 1/4 turn.

Back off FC300, FC350 and FC355 hose 1/4 to 1/2 turn.

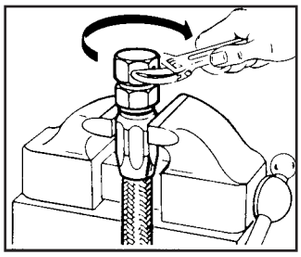


**Step 3**

MALE ENDS: Push assembly tool into nipple.

SWIVEL ENDS: Tighten nipple and nut on assembly tool.

Lubricate nipple, mandrel and inside of hose liberally. Use heavy oil or Danfoss 222070 hose assembly lube.



**Step 4**

MALE ENDS: Screw nipple clockwise into socket and hose. Leave a 1/32" to 1/16" clearance between nipple hex and socket.

SWIVEL ENDS: Screw nipple clockwise into socket and hose. Leave 1/32" to 1/16" clearance between nut and socket.

Recommendations for cleaning, inspection and testing are summarized on page 380. Disassemble in reverse order.



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Aeroquip by Danfoss

# Glossary & index

## A

**abrasion:** external damage to a hose assembly caused by its being rubbed on a foreign object; a wearing away by friction.

**ABS:** Air-Brake Swivel absorption: regarding hose, the process of taking in fluid. Hose materials are often compared with regard to relative rates and total amounts of absorption as they pertain to specific fluids.

**acid resistant:** having the ability to withstand the action of identified acids within specified limits of concentration and temperature

**adapter, adaptor: 1)** fittings of various sizes and materials used to change an end fitting from one type to another type or one size to another. (i.e., a male SAE to male pipe adapter is often attached to a female SAE to create a male end union fitting); **2)** the grooved portion of a cam & groove coupling.

**adhesion:** the strength of bond between cured rubber surfaces or between a cured rubber surface and a non-rubber surface.

**adhesive:** a material which, when applied, will cause two surfaces to adhere.

**ambient temperature:** the temperature of the atmosphere or medium surrounding an object under consideration.

**ambient/atmospheric conditions:** The surrounding conditions, such as temperature, pressure, and corrosion, to which a hose assembly is exposed.

**amplitude of vibrations and/or lateral movement:** the distance a hose assembly deflects laterally to one side from its normal position, when this deflection occurs on both sides of the normal hose centerline.

**anchor:** a restraint applied to eliminate motion and restrain forces.

**annular:** refers to the convolutions on a hose that are a series of complete circles or rings located at right angles to the longitudinal axis of the hose (sometimes referred to as "bellows").

**anodize, anodized:** an electrolytic process used to deposit protective or cosmetic coatings in a variety of colors on metal; primarily used with aluminum.

**ANSI:** American National Standards Institute.

**application working pressure:** unique to customer's application. See pressure, working.

**application:** the service conditions that determine how a hose assembly will be used.

**armor:** a protective cover slid over and affixed to a hose assembly; used to prevent over bending or for the purpose of protecting hose from severe external environmental conditions such as hot materials, abrasion, or traffic.

**assembly:** a general term referring to any hose coupled with end fittings of any style attached to one or both ends.

**ASTM:** American Society for Testing and Materials.

**attachment:** the method of securing an end fitting to a hose (e.g., banding, crimping, swaging, or screw-together 2 piece or 3 piece-style field attachable fittings).

**axial movement:** compression or elongation along the longitudinal axis.

## B

**backing:** a soft rubber layer between a hose tube and/or cover and carcass to provide adhesion.

**barb:** the portion of a fitting (coupling) that is inserted into the hose, usually comprised of two or more radial serrations or ridges designed to form a redundant seal between the hose and fitting.

**barbed and ferrule fitting:** a two-piece hose fitting comprised of a barbed insert (nipple), normally with peripheral ridges or backward-slanted barbs, for inserting into a hose and a ferrule; usually crimped or swaged.

**Barb-Tite:** a line of low pressure push-on brass hose end fittings that is a trademark of Danfoss Corporation.

**bend radius:** the radius of a bent section of hose measured to the innermost surface of the curved portion.

**bend radius, minimum:** the smallest radius at which a hose can be used. For metal hose: the radius of a bend measured to the hose centerline, as recommended by the manufacturer.

**blister:** a raised area on the surface or a separation between layers usually creating a void or air-filled space in a vulcanized article.

**blow out force:** the force generated from the internal pressure attempting to push the fitting from the hose.

**body wire:** normally a round or flat wire helix embedded in the hose wall to increase strength or to resist collapse.

**bore: 1)** an internal cylindrical passageway, as of a tube, hose or pipe; **2)** the internal diameter of a tube, hose, or pipe.

**braid:** the woven portion of a hose used as reinforcement to increase pressure rating and add hoop strength. Various materials such as polyester, cotton or metal wire are used. A hose may have one or more braids, outside or between layers of hose material.

**braid wear:** motion between the braid and corrugated hose, which normally causes wear on the outside diameter of the corrugation and the inside diameter of the braid.

**braided ply:** a layer of braided reinforcement.

**braid-over-braid:** multiple plies of braid having no separating layers.

**brand:** a mark or symbol identifying or describing a product and/or manufacturer, that is embossed, inlaid or printed.

**brass:** a family of copper/zinc alloys.

**brazing:** a process of joining metals using a non-ferrous filler metal having a melting point that is lower than the "parent metals" to be joined, typically over +800°F (+427°C).

**bronze:** an alloy of copper, tin and zinc.

**BSPP/BSPT:** British Standard Pipe Parallel / British Standard Pipe Tapered. See fitting/coupling — pipe thread fittings.

## C

**carcass:** the fabric, cord and/or metal reinforcing section of a hose as distinguished from the hose tube or cover.

**chalking:** the formation of a powdery surface condition due to disintegration of surface binder or elastomer by weathering or other destructive environments.

**checking:** the short, shallow cracks on the surface of a rubber product resulting from damaging action of environmental conditions.

**chemical compatibility:** the relative degree to which a material may contact another without corrosion, degradation or adverse change of properties.

**chemical resistance:** the ability of a particular polymer, rubber compound, or metal to exhibit minimal physical and/or chemical property changes when in contact with one or more chemicals for a specified length of time, at specified concentrations, pressure, and temperature.

**cold flexibility:** relative ease of bending while being exposed to specified low temperature.

**collar: 1)** the portion of a fitting that is compressed by crimping to seal the hose onto the fitting barbs and create a permanent attachment; also called a ferrule. (With field attachable fittings, the lock and seal are accomplished mechanically by the collar without crimping); **2)** a raised portion on the hose shank which functions as a connection for a ferrule or other locking device or functions as a hose stop.

**collet:** a tool or die-set used to crimp a hose end fitting onto a hose. A crimping die-set is typically six to eight "fingers" designed for infinite diameter settings within a range or preset to a specific diameter for a given hose type and size. Some may have a replaceable cage.

**Coll-O-Crimp:** a line of hydraulic and pneumatic hose, hose end fittings, and fabrication equipment that is a registered trademark of Danfoss Corporation.

**combustible liquid:** a liquid having a flash point at or above +100°F (+37.8°C).



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## Glossary

**compound:** the mixture of rubber or plastic and other materials, which are combined to give the desired properties when used in the manufacture of a product.

**compression fitting:** see fitting/coupling – compression

**conductive:** the ability to transfer electrical potential.

**configuration:** the combination of fittings on a particular assembly.

**convoluted:** description of hose or innercore having annular or helical ridges formed to enhance flexibility.

**core:** the inner portion of a hose, usually referring to the material in contact with the medium.

**corrosion:** the process of material degradation by chemical or electrochemical means.

**corrosion resistance:** ability of metal components to resist oxidation.

**corrugated hose:** hose with a carcass fluted, radially or helically, to enhance its flexibility or reduce its weight.

**coupling:** a frequently used alternative term for hose end fitting.

**cover:** the outer component usually intended to protect the carcass of a product.

**CPE:** chlorinated polyethylene, a rubber elastomer.

**cracking:** a sharp break or fissure in the surface, generally caused by strain and environmental conditions.

**crimp diameter:** the distance across opposite flats after crimping.

**crimp/crimping:** a hose end fitting attachment method utilizing a number of dies mounted in a radial configuration. The dies close perpendicular to the hose and fitting axis, compressing the collar, ferrule, or sleeve around the hose.

**cure:** the act of vulcanization. See vulcanization.

**cut off factor:** the hose length to be subtracted from the overall assembly length that allows for the hose coupling end connection extension beyond the end of the hose.

### D

**date code:** any combination of numbers, letters, symbols or other methods used by a manufacturer to identify the time of manufacture of a product.

**deburr:** to remove ragged edges from the inside diameter of a hose end.

**design factor:** a ratio used to establish the working pressure of the hose, based on the burst strength of the hose.

**displacement:** the amount of motion applied to a hose defined as inches for parallel offset and degrees for angular misalignment.

**DOT:** Department of Transportation.

**DIN:** Deutsche Industrie Norme.

**duplex assembly:** an assembly consisting of two hose assemblie, one inside the other, and connected at the ends; also known as "jacketed assemblies."

**durometer:** an instrument for measuring the hardness of rubber and plastic compounds.

### E

**eccentricity:** the condition resulting from the inside and outside diameters not having a common center.

**effusion:** the escape, usually of gases, through a material. See permeation.

**elastic limit:** the limiting extent to which a body may be deformed and yet return to its original shape after removal of the deforming force.

**elastomer:** any one of a group of polymeric materials, usually designated thermoset, such as natural rubber, or thermoplastic, which will soften with application of heat.

**elongation:** the increase in length expressed numerically as a percentage of the initial length.

**EN:** European Normes

**ERMETO:** a steel fitting product trademarked by Danfoss Corporation.

**endurance test:** a service or laboratory test, conducted to product failure, usually under normal use conditions.

**EPDM:** Ethylene Propylene Diene Monomer; an elastomer.

**extrude/extruded/extrusion:** forced through the shaping die of an extruder; extrusion may have a solid or hollow cross section.

### F

**fabric impression:** impression formed on the rubber surface during vulcanization by contact with fabric jacket or wrapper.

**fabricator:** the producer of hose assemblies.

**fatigue:** the weakening or deterioration of a material occurring when a repetitious or continuous application of stress causes strain, which could lead to failure.

**FDA:** United States Food and Drug Administration.

**fire sleeve:** slip-on or integrally extruded sleeve used to retard the effects of fire in certain applications; most often made with silicone and/or ceramic fiber.

**fitting/coupling:** a device attached to the end of the hose to facilitate connection. The following is only a partial list of types of fittings available.

- **banjo fitting:** a through bolted designed featuring a hollow circle or "donut" attached to one end of the fitting barb so that the inner diameter is along the hose axis.
- **compression fitting:** a fitting style that seals on a mating tube by compressing an internal ferrule against the tube O.D.
- **field attachable fitting:** a fitting designed to be attached to hose without crimping or swaging. This fitting is not always a reusable type fitting.
- **flange style fittings:** pipe flanges and flanged fitting standards are listed under ANSI B16.5. Flanges are rated for pressure and listed as "American Class 150, 300, 400, 600, 900, 1,500 or 2,500." Pressure-temperature ratings can be obtained by consulting the ANSI specification or ASME B16.5 (American Society of Mechanical Engineers). Designs vary by neck and face style, or other dimensional changes based on use. Various finishes or grooves may be applied to the face for sealing on a gasket or o-ring. Bolt holes and other dimensions are per the ANSI standard.
- **inverted flare fitting:** a fitting consisting of a male or female nut, trapped on a tube by flaring the end of the tube material to either 37° or 45°.
- **JIC fittings:** Joint Industrial Council (no longer in existence). An engineering group that established an industry standard fitting design incorporating a 37° mating surface, male and female styles. These standards are now governed by SAE.
- **o-ring fittings:** a fitting that seals by means of an elastomeric ring of a specified material.

**pipe thread fittings:**

- **NPT:** National Pipe Taper. Pipe thread per ANSI B1.20.1
- **NPTF:** National Pipe Tapered for Fuels. (Same as above except dry-seal per ANSI B1.20.3)
- **NPSH:** National Pipe Straight Hose per ANSI B1.20.7
- **NPSM:** National Pipe Straight Mechanical. Straight thread per ANSI B1.20.1
- **NPSL:** National Pipe Straight Loosefit per ANSI B1.20.1
- **BSPP, BSPT:** British Standard Pipe Parallel, British Standard Pipe Taper. BS21-
- quick connect fitting: a fitting designed to quickly connect and disconnect. These fittings come in many styles and types.
- split flange fitting**:** a fitting consisting of a flange retainer and a flange of two halves. This design allows the flanges to be installed after the retainer has been attached to the hose, making the flange reusable. SAE code 61 and 62.
- **tube fitting:** a hose fitting of which the mating end conforms to a tube diameter. The mate or male end of a compression fitting.

**flammable gases/liquid/media:** a flammable gas, including liquefied gas, is one having a closed cup flash point below +100ºF (+37.8ºC) and a vapor pressure greater than 25 psi (174.2 KPa).

**flex cracking:** a surface cracking induced by repeated bending and straightening.

**flow rate:** a volume of media being conveyed in a given time period.

**fluid:** a gas or liquid medium.

**fluorocarbon:** an organic compound containing fluorine directly bonded to carbon. The ability of the carbon atom to form a large variety of structural chains gives rise to many fluorocarbons and fluorocarbon derivatives.



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**FOR-SEAL:** a product name for a hose end configuration using an o-ring sealing method, trademarked by Danfoss Corporation.

## G

**gpm:** gallons per minute.

## H

**heat resistance:** the property or ability to resist the deteriorating effects of elevated temperatures.

**helix:** a shape formed by spiraling a wire or other reinforcement around the cylindrical body of a hose; typically used in suction hose.

**hose:** a flexible conduit consisting of a tube, reinforcement, and usually an outer cover.

**hydrostatic testing:** the use of liquid pressure to test a hose or hose assembly for leakage, twisting, and/or hose change-in-length.

**Hytrel:** registered trademark of Chemours.

## I

**I.D.:** inside diameter.

**identification yarn:** a yarn of single or multiple colors, usually embedded in the hose wall, used to identify the manufacturer.

**impression:** a design formed during vulcanization in the surface of a hose by a method of transfer, such as fabric impression or molded impression.

**impulse:** an application of force in a manner to produce sudden strain or motion, such as hydraulic pressure applied in a hose.

**innertube:** the innermost layer of a hose; the hose material in contact with the medium.

**insert:** optional term for nipple. See nipple.

**interlocking clamp:** a clamp which engages the fitting in a manner which prevents the clamp from sliding off the fitting, typically a bolt or U-bolt style with interlocking fingers which engage an interlock ring on the fitting.

**interlocking ferrule:** a ferrule, which physically attaches to the fitting preventing the ferrule from sliding off the fitting.

**ISO:** International Organization for Standardization.

## J

**jacket:** a seamless tubular braided or woven ply generally on the outside of a hose.

**JIC:** see fitting/coupling—JIC.

## K

**kinking:** a temporary or permanent distortion of the hose induced by bending beyond the minimum bend radius.

## L

**layline:** the line of printed information that runs parallel on the side of a manufactured hose giving details such as part number, psi rating, hose size, and manufacturing data.

**layer:** a single thickness of rubber or fabric between adjacent parts.

**loop installation:** the assembly is installed in a loop or "U" shape, and is most often used when frequent and/or large amounts of motion are involved.

**LPG, LP Gas:** liquefied petroleum gas.

## M

**MAWP:** see pressure, maximum allowable working.

**mandrel built:** a hose fabricated and/or vulcanized on a mandrel.

**manufacturer's identification:** a code symbol used on or in some hose to indicate the manufacturer.

**media, medium:** the substance(s) being conveyed through a system.

## N

**NAHAD:** National Association of Hose & Accessories Distributors.

**Neoprene:** a registered trademark of Chemours.

**nipple:** the internal member or portion of a hose fitting.

**nitrile rubber (NB/Buna-N):** a family of acrylonitrile elastomers used extensively for industrial hose.

**nominal:** a size indicator for reference only.

**nomograph:** a chart used to compare hose size to flow rate to recommended velocity.

**non-conductive:** the inability to transfer an electrical charge.

**NPT/NPTF:** national pipe threads. See fitting/coupling — pipe thread fittings.

**nylon:** a family of polyamide materials.

## O

**OAL:** see overall length

**O.D.:** outside diameter.

**OE/OEM:** original equipment manufacturer.

**oil resistance:** the ability of the materials to withstand exposure to oil.

**oil swell:** the change in volume of a rubber article resulting from contact with oil.

**operating conditions:** the pressure, temperature, motion, and environment to which a hose assembly is subjected.

**o-ring fitting:** see fitting/coupling—o-ring.

**overall length (OAL):** the total length of a hose assembly, which consists of the free hose length plus the length of the coupling(s).

**oxidation:** the reaction of oxygen on a material, usually evidenced by a change in the appearance or feel of the surface or by a change in physical properties.

**ozone cracking:** the surface cracks, checks, or crazing caused by exposure to an atmosphere containing ozone.

**ozone resistance:** the ability to withstand the deteriorating effects of ozone (generally cracking).

## P

**permanent fitting:** the type of fitting which, once installed, may not be removed for re-use.

**permeation:** the process of migration of a substance into and through another, usually the movement of a gas into and through a hose material; the rate of permeation is specific to the substance, temperature, pressure, and the material being permeated.

**pin pricked:** perforations through the cover of a hose to vent permeating gases.

**pitch: 1)** the distance from one point on a helix to the corresponding point on the next turn of the helix, measured parallel to the axis; **2)** the distance between the two peaks of adjacent corrugation or convolution.

**plating:** a material, usually metal, applied to another metal by electroplating, for the purpose of reducing corrosion; typically a more noble metal such as zinc is applied to steel.

**ply:** an individual layer in hose construction.

**polymer:** a macromolecular material formed by the chemical combination of monomers, having either the same or different chemical compositions.

**pressure:** force ÷ unit area. For purposes of this document, refers to PSIG (pounds per square inch gauge).

**pressure drop:** the measure of pressure reduction or loss over a specific length of hose.

**pressure, burst:** the pressure at which rupture occurs.

**pressure, maximum allowable working:** the maximum pressure at which a hose or hose assembly is designed to be used. Abbreviated as MAWP.

**pressure, working:** the maximum pressure to which a hose will be subjected, including the momentary surges in pressure, which can occur during service. Abbreviated as WP.

**psi:** pounds per square inch.

**PVC:** polyvinyl chloride. A low cost thermoplastic material typically used in the manufacture of industrial hoses. The operating temperature range is -500ºF to +1750ºF (-295.5ºC to +954.4ºC).

## R

**reinforcement:** the strengthening members, consisting of either fabric, cord, and/or metal, of a hose. See ply.

**reusable fitting/coupling:** see fitting/coupling—field attachable fittings.

**RMA:** The Rubber Manufacturers Association, Inc.



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## Glossary

### S

**SAE:** Society of Automotive Engineers.

**shank:** that portion of a fitting, which is inserted into the bore of a hose.

**skive:** the removal of a short length of cover and/or tube to permit the attachment of a fitting directly over the hose reinforcement.

**sleeve:** a metal cylinder, which is not physically attached to the fitting, for the purpose of forcing the hose into the serrations of the fitting.

**smooth bore:** a term used to describe the type of innercore in a hose.

**specification:** a document setting forth pertinent details of a product.

**spiral:** a method of applying reinforcement in which there is not interlacing between individual strands of the reinforcement.

**spring guard:** a helically wound component applied internally or externally to a hose assembly, used for strain relief, abrasion resistance, collapse resistance.

**standard:** a document, or an object for physical comparison, for defining product characteristics, products, or processes, prepared by a consensus of a properly constituted group of those substantially affected and having the qualifications to prepare the standard for use.

**static wire:** wire incorporated in a hose to conduct static electricity.

**stem:** see nipple.

**Sub-Zero:** a low temperature resistant hose that is a registered trademark of Danfoss Corporation.

**surge (spike):** a rapid and transient rise in pressure.

**swelling:** an increase in volume or linear dimension of a specimen immersed in liquid or exposed to a vapor.

### T

**Thick-Flange:** a hose end fitting that is trademarked by Danfoss Corporation.

**tube:** the innermost continuous all-rubber or plastic element of a hose.

**tube fitting:** see fitting/coupling—tube.

**tubing:** a non-reinforced, homogeneous conduit, generally of circular cross-section.

### V

**vacuum resistance:** the measure of a hoses ability to resist negative gauge pressure.

**vibration:** amplitude motion occurring at a given frequency.

**viscosity:** the resistance of a material to flow.

**vulcanization:** a process during which a rubber compound, through a change in its chemical structure, improves or extends elastic properties over a greater range of temperature.

### W

**weathering:** the surface deterioration of a hose cover during outdoor exposure, as shown by checking, cracking, crazing and chalking.

**wire reinforced:** a hose containing wires to give added strength, increased dimensional stability and crush resistance. See reinforcement.

**working temperature:** the temperature range of the application; may include the temperature of the fluid conveyed or the environmental conditions the assembly is exposed to in use.

**WP:** working pressure.



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| 2025 | D31 | 190111 | C74 | 1AA*FJC* | C39 | 4012 | D11 |
| 2028 | D31 | 190235 | C76 | 1AA*FR* | C57 | 412 | C70 |
| 2033 | D20 | 190260 | C40 | 1AA*FRA* | C59 | 4411 | C34 |
| 2039 | D20 | 190261 | C38 | 1AA*FRB* | C61 | 4412 | C70 |
| 2042 | D20 | 190265 | C36 | 1AA*FRC* | C63 | 4414 | C68 |
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