

|                     |  |
|---------------------|--|
| Centre              |  |
| Contact Person      |  |
| Customer / End User |  |
| Date                |  |

Please attach any photos or dimensional sketches of the products (or application) with this form if appropriate to assist in clarifying request

Date response / quote required



| SIZE | Dash Size | Millimetres |
|------|-----------|-------------|
|      |           |             |

|                                         |  |
|-----------------------------------------|--|
| <b>TEMPERATURE °C</b>                   |  |
| Temperature of Medium °C                |  |
| Environmental Temp °C                   |  |
| <b>Comments on Temperature</b>          |  |
| Please add comments on temperature here |  |

|                                                                                                |                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>APPLICATION</b>                                                                             | Consider (but not limited to) whether the component is indoor or outdoor, bend radius, movement, types of conditions, type of machine or apparatus, what the product is intended for, etc |
| Be as descriptive as possible to convey what the hose / item will be subjected to in this cell |                                                                                                                                                                                           |

|                                                                                                                |                                                                                                            |                                             |       |
|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|
| <b>MEDIUM CONVEYED</b>                                                                                         |                                                                                                            |                                             |       |
| If the medium is more complex and no MSDS is attached, please detail here with as much information as possible |                                                                                                            |                                             |       |
|                                                                                                                |                                                                                                            |                                             |       |
| <b>Comments on Medium</b>                                                                                      | <table border="1"> <tr> <td>If medium is complex then is MSDS attached?</td> <td>Y / N</td> </tr> </table> | If medium is complex then is MSDS attached? | Y / N |
| If medium is complex then is MSDS attached?                                                                    | Y / N                                                                                                      |                                             |       |
| Please add specific details pertaining to medium here                                                          |                                                                                                            |                                             |       |

|                                                                    |  |
|--------------------------------------------------------------------|--|
| <b>PRESSURE (Bar)</b>                                              |  |
| Operating Pressure (Bar)                                           |  |
| Peak Pressure (Bar)                                                |  |
| <b>VACUUM / SUCTION (Gauge)</b>                                    |  |
| mm Mercury (mm/hg)                                                 |  |
| Bar                                                                |  |
| <b>Comments on Pressure or Suction</b>                             |  |
| Please add specific details pertaining to pressure or suction here |  |

**ENDS / ADAPTORS - Connections**

|                          |  |
|--------------------------|--|
| Prospective Part No.     |  |
| Type (Termination)       |  |
| Termination Angle (°)    |  |
| Material                 |  |
| Retention type eg Bandit |  |

**Comments on Ends**

Please add specific details pertaining to ends here

**DELIVERY**

|                                          |  |
|------------------------------------------|--|
| Date product is required to the customer |  |
|------------------------------------------|--|

**Comments on Delivery**

Please add specific details pertaining to delivery here

**COMMERCIAL AND ORDER DETAILS**

|                                        |  |
|----------------------------------------|--|
| Opening Order Quantity (qty or metres) |  |
| Annual Quantity (qty or metres)        |  |
| On going or once-off project           |  |

**Comments on Quantity and Commercial Considerations**

Please add specific details pertaining to quantity and any commercial considerations here

**Please advise what current Product Brands and Part Numbers are being used in the Application (if applicable)**

Please indicate how any existing product is performing in the application and in what aspects are improvements sought

**Target Pricing if known or if applicable****General Comments pertaining to this enquiry**

Please add general details pertaining to this enquiry here



# Recommended Practices for Hydraulic Hose Assemblies – SAE J1273 2002-12

## Foreword

This SAE Recommended Practices is intended as a guide to consider when selecting, routing, fabricating, installing, replacing, maintaining, and storing hose for fluid-power systems. It is subject to change to keep pace with experience and technical advances. For those new to hose use in fluid power systems, this guide outlines practices to note during each phase of system design and use. Experienced designers and users skilled in achieving proper results, as well as the less experienced, can use this outline as a list of considerations to keep in mind.

Fluid-power systems are complex and require extensive knowledge of both the system requirements and the various types of hose. Therefore, all inclusive, detailed, step by step instructions are not practical and are beyond the scope of this document. Less experienced designers and users who need more information can consult specialists such as hose suppliers and manufacturers. This-guide can improve the communication process.

## Safety Considerations

These recommended practices involve safety considerations; note these carefully during all phases of design and use of hose systems. Improper selection, fabrication, installation, or maintenance of hose and hose assemblies for fluid power systems may result in serious personal injury or property damage. These recommended practices can reduce the likelihood of component or system failure, thereby reducing the risk of injury or damage.

1. Scope – SAEJ1273 provides guidelines for selection, routing, fabrication, installation, replacement, maintenance, and storage of hose and hose assemblies for fluid-power systems. Many of these SAE-Recommended Practices also may be suitable for other hoses and systems.
2. Reference
  - 2.1 Applicable publications – The following publications form a part of this specification to the extent specified herein. Unless otherwise specified, the latest issue of SAE publications shall apply.
    - 2.1.1 SAE publications – Available for SAE, 400 Commonwealth Drive, Warrendale, PA 15096-000
      - SAEJ343 – Test and Procedures for SAE 100 R Series Hydraulic Hose and Hose Assemblies
      - SAEJ514 – Hydraulic Tube Fittings
      - SAEJ517 – Hydraulic Hose
      - SAEJ1927 – Cumulative Damage Analysis for Hydraulic Hose Assemblies
    - 2.1.2 ISO publications – Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002
      - ISO 3457 – Earth moving machinery – Guards and shields – definitions and specifications.

## 3. Definitions

These explanations serve only to clarify this document and are not intended to stand alone. They are presented sequentially, with the former helping to explain the latter.

- 3.1 Fluid-power  
Energy transmitted and controlled using pressurised hydraulic fluids or compressed air.
- 3.2 Hose – flexible conductor.  
In this document, the term hose also may refer to a hose assembly with related accessories used in fluid power applications.
- 3.3 Hose fitting or fitting – connector which can be attached to the end of a hose.
- 3.4 Hose assembly – hose with hose fittings attached.
- 3.5 Hose failure – occurrence in which a hose stops meeting system requirements.
- 3.6 Hose service life – length of time a hose meets system requirements without needing replacement.
4. Safety considerations – listed in 4.1 to 4.7 are some potential conditions and situations that may lead to personal injury and/or property damage. This list is not necessarily all inclusive. Consider reasonable and feasible means, including those described in this section, to reduce the risk of injuries or property damage. Training, including the information in this document, for operators, maintenance personnel, and other individuals working with hoses under pressure is encouraged.
  - 4.1 Fluid injections – fine streams of escaping pressurised fluid can penetrate skin and enter a human body. These fluid injections may cause severe tissue damage and loss of limb.  
Consider various means to reduce the risk of fluid injections, particularly in areas normally occupied by operators. Consider careful routing, adjacent components, warnings, guards, shields, and training programs.  
Relieve pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.  
Avoid contact with escaping fluids. Treat all leaks as though pressurised and hot enough to burn skin. Never use any part of your body to check a hose for leaks.  
If a fluid-injection accident occurs, see a doctor immediately.  
DO NOT DELAY OR TREAT AS A SIMPLE CUT! Any fluid injected into skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should consult a knowledgeable medical source.
  - 4.2 Whipping hose – if a pressurised hose assembly blows apart, the fittings can be thrown off at high speed, and the loose hose can flail or whip with great force. This is particularly true in compressible-fluid systems.  
When the risk exists, consider guards and restraints to protect against injury.
  - 4.3 Burns from conveyed fluids – fluid-power media may reach temperatures that can burn human skin. If there is risk of burns from escaping fluid, consider guards and shields to prevent injury, particularly in areas normally occupied by operators.
  - 4.4 Fire and explosions from conveyed fluids – most fluid-power media, including fire-resistant hydraulic fluids, will burn under certain conditions. Fluids which escape from pressurised systems may form a mist or fine spray which can flash or explode upon contact with an ignition source. Consider selecting, guarding, and routing hose to minimise the risk of combustion (see Section 5 and ISO 3457).
  - 4.5 Fire and explosions from static-electric discharge – fluid passing through hose can generate static electricity, resulting in static-electric discharge. This may create sparks that can ignite system fluids or gases in the surrounding atmosphere.  
When this potential exists, select hose specifically designed to carry the static-electric charge to ground.

# (R) Test and Test Procedures for SAE 100R Series Hydraulic Hose and Hose Assemblies – SAE J343 July 2001

This document is technically equivalent to ISO 6605 except as noted in the foreword.

Foreword – this document has not changed other than to put it into the new SAE technical standards board format.

SAE J343 has been revised to be technically equivalent to ISO 6605, except that additional tests in paragraphs 4.9 to 4.14 were included.

1. Scope – this SAE standard gives methods for testing and evaluation performance of the SAE 100R series of hydraulic hose and hose assemblies (hose and attached end fittings) used in hydraulic fluid power systems.

Specific tests and performance criteria for evaluating hose assemblies used in hydraulic service are in accordance with the requirements for hose in the respective specifications of SAE J517.

This document further establishes a uniform means of testing and evaluating performance of hydraulic hose assemblies.

2. Reference

- 2.1 Applicable publications – The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated the latest revision of SAE publications shall apply.

2.1.1. SAE Publications – available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001

SAE J517 Hydraulic hose.

2.1.2. ASTM publications – available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 380 – standard methods of testing rubber hose.

2.1.3. ISO publications – available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ISO 3448 – industrial liquid lubricants-ISO viscosity classification

ISO 6605 – hydraulic fluid-power hose assemblies – method of test.

3. Test procedures

The test procedures described in the current issue of ASTM D 380 shall be followed. However, in cases of conflict between the ASTM specifications and those described as follows, the latter shall take precedence. Unless otherwise specified in this document, or other SAE standards, tests shall be conducted at the prevailing ambient temperature of the testing facility.

4. Standard test warning – water or another liquid suitable for the hose under test shall be used as the test medium. The use of air and other gaseous materials as testing media should be avoided because of the risk to operators. In special cases where such media are required for the tests, strict safety measures are imperative. Furthermore, it is stressed that when a liquid is used as the test medium, it is essential that all air is expelled from the test piece because of the risk of injury to the operator due to the sudden expansion of trapped air released when the hose bursts.

- 4.1. Dimensions check test – The hose shall be inspected for conformity to all dimensions tabulated in the applicable specification.

Determine finished outside diameters and reinforcement diameters, where required, by calculation from measurement of the respective circumference. As an alternative, use a flexible tape graduated to read the diameter directly.

Measure the inside diameter by means of a suitable expanding ball or telescoping gauge.

Measure concentricity over both the reinforcement and the finished outside diameters using either a dial indicator gauge or a micrometer.

Round the foot of the measuring instrument to conform to the inside diameter of the hose.

Take reading at 90 degree intervals around the hose.

NOTE: Acceptability is based on the total variation between the high and low readings.

Take inside and outside diameter measurements at a minimum of 25mm from the hose ends and concentricity measurements at a minimum of 13 mm from the hose ends.

- 4.2. Proof test

Test the hose assemblies hydrostatically to the specified proof pressure for a period of not less than 30 s nor more than 60 s.

There shall be no indication of failure or leakage.

- 4.3. Change in length test – Conduct measurements for the determination of elongation or contraction on a previously untested, unaged hose assembly having at least 600 mm length of free hose between hose fittings.

Attach the hose assembly to the pressure source in an unrestricted straight position. If the hose is not straight due to its natural curvature, it may be fastened laterally to achieve a straight position. Pressurise to the specified operating pressure for a period of 30 s, then release the pressure.

Place accurate reference marks 500 mm apart on the outer cover of the hose, midway between fittings, after allowing the hose assembly to stabilise for a period of 30 s, following pressure release.

Repressurise the hose assembly to the specified operating pressure for a periods of 30 s.

Measure the final length while the hose is pressurised. The final length is the distance between reference marks while the hose is-pressurised.

Complete the determination of the change in length using Equation 1:

$$\Delta l = \frac{l_1 - l_0}{l_0} \times 100 \quad (\text{Eq.1})$$

where:

$l$  is the distance between the reference marks when the hose was not pressurised following the initial pressurisation;

$l_1$  is the distance between the reference marks under pressure;

$\Delta l$  is the percentage change in length, which will be positive (+) in the case of an increase in length and negative (–) in the case of a decrease in length.

- 4.4. Burst test – Subject unaged hose assemblies, on which the end fittings have been attached for not more than 30 days, to a hydrostatic pressure, increased at a constant rate so as to attain the specified minimum burst pressure within a period of not less than 15 s nor more than 60 s.

Reject hose assemblies showing leakage, hose burst or indication of failure below the specified minimum burst pressure.

NOTE: This is a destructive test. Assemblies which have been subjected to this test shall be destroyed.

- 4.5. Cold bend test – subject hose assemblies to the specified temperature in a straight position for 24 h.

Then, while still at the specified temperature, the samples shall be evenly and uniformly bent once over a mandrel having a diameter equal to twice the specified minimum bend radius. Bending shall be accomplished within a period of not less than 8-s nor more than 12 s.

In the case of hose sizes up to and including 22 mm nominal inside diameter, bend them through 180 degrees over the mandrel; in the case of hose sizes larger than 22 mm nominal inside diameter, bend them through 90 degrees over the mandrel.

After bending, allow the sample to warm to room temperature, visually examine it for cover cracks and subject it to the proof test. There shall be no cover cracks or leakage. (In lieu of the bending test, hoses larger than 22 mm nominal inside diameter may be considered acceptable if samples of tube and cover pass the Low Temperature Test on Tube and Cover of ASTM D 380).

Reject any samples with visible cracks of leakage.

NOTE: This is a destructive test. Assemblies which have been subjected to this test shall be destroyed.

- 4.6. Impulse test – test for unaged hose assemblies with end fittings which have been attached for not more than 30 days. Where the individual standard requires, also test aged hose assemblies.

Apply a pulsating pressure internally to the hose assemblies at a rate between 0.5 and 1.34 Hz; record the frequency used. The pressure cycle shall fall within the shaded areas of Figure 1 of SAE J343 and conform as closely as possible to the curve shown.

Select a test fluid which complies with the requirements of ISO VG 46± 4.6 at 40°C per ISO 3448, and circulate it at a rate sufficient to maintain a uniform fluid temperature within the hose assemblies.

Other fluids may be used as agreed upon between the customer and the manufacturer.

Calculate the free (exposed) length of hose under test, shown on Figure 2, as follows:

- a. Hose sizes up to and including 22 mm nominal inside diameter (see Equation 3):

$$180 \text{ degrees bend free length} = \pi r + 2d \quad (\text{Eq.3})$$

- b. Hose sizes larger than 22 mm nominal inside diameter (see-Equation 4):

$$90 \text{ degrees bend free length} = \frac{\pi}{2} r + 2d \quad (\text{Eq.3})$$

where:

r = minimum bend radius

d = hose outside diameter

Connect the test pieces to the apparatus. The test pieces shall be installed according to Figure 2 of SAE J343. Test pieces of hose of nominal inside diameter up to and including 22 mm shall be bent through 180 degrees and hoses of nominal inside diameter larger than 22 mm shall be bent through 90 degrees.

Test the hose at the impulse test pressure indicated in the individual specification. The test fluid shall be circulated through the assemblies at the specified temperature with a tolerance of 3°C. Cooling or heating of the test chamber shall not be permitted, except when individual standards require testing with synthetic base test fluids at a temperature higher than 150°C. When such higher temperatures are required, the impulse test fluid need not be circulated if both the fluid and the assemblies are externally heated in the test chamber, at the specified temperature with a tolerance of 5°C. Determine the duration of the impulse test in total number of cycles by the individual standard for the hose assemblies. Where aged samples are required, refer to the individual standards.

It is recommended the test fluid be changed frequently to prevent breakdown.

NOTE: This is a destructive test. Assemblies which have been subjected to this test shall be destroyed.

- 4.7 Leakage test – Subject unaged hose assemblies, on which the end fitting have been attached for not more than 30 days, to a hydrostatic pressure of 70% of the specified minimum burst pressure for a period of between 5.0 to 5.5 min.

Reduce the fluid pressure to 0 MPa.

Re-apply the 70% of minimum burst hydrostatic pressure for another 5.0 to 5.5 min period.

Reject assemblies showing leakage or failure.

NOTE: This is a destructive test. Assemblies which have been subjected to this test shall be destroyed.

A mercury or salt water solution electrode shall be provided at the upper end as shown, by inserting a non-metallic plug with an O-ring seal to distance of 75-mm from the end of the tubing, thus providing an average test length of 255 mm. Mercury or salt water solution shall then be added to a level

25 mm above the plug. Any suitable conductor to this electrode may be used, including a threaded end attached to the plug if so desired.

Concentration of salt water, if used, shall be 450 g NaCl per litre of H<sub>2</sub>O.

1000 V DC shall be applied between the upper electrode and the lower electrode (adaptor or male fitting hex). The current shall be measured with an instrument with a sensitivity of at least 1 µA (1 x 10<sup>-6</sup> A).

- 4.13 Resistance to vacuum test – The hose shall not blister nor show any other indication of failure when subjected to the specified vacuum for a period of 5 min. Where practicable, one end of the hose shall be equipped with a transparent cap and electric light to permit visual examination for failure. Where the length or size of the hose precludes visual examination, failure shall be determined by inability to pass through the hose a ball or cylinder 6.5 mm less in diameter than the bore or hoses of 12.5-mm nominal inside diameter and larger. For hoses under 12.5-mm nominal inside diameter, a ball or cylinder 3.0 mm smaller in diameter than the bore shall be used.

## Hose and Fitting Compatibility

Pirtek strongly recommend that only Pirtek hose and fittings are used in an assembly. We do not condone the use of other brand hose used with our fittings, or other fittings used with our hose. Any fabrication of a hose assembly outside this is deemed to be the fabricators risk and is not recommended.

The SAE specification for Hydraulic Hose, J517, paragraph 5 reads:

**Hose Assemblies**—*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 specialised assembly equipment. Field attachable fittings (screw style and segment clamp style) can usually be assembled without specialised equipment although many manufacturers provide equipment to assist in this 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 of 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.*

# Selection of Hose

## System type

The selection and installation of hoses must be in relation to pump pressure, operating cycle, inner diameters of pipes, type of fluid.

## Operating pressure

Hose lines are rated for continuous operation at the maximum operating pressures specified for the hose. Generally, the operating pressure is one fourth the hose minimum burst pressure, thus meeting the SAE recommended safety factor of 4 to 1.

## Pressure surges

Almost all hydraulic systems develop pressure surges which may exceed relief valve settings and affect the service life of hose and system components. In systems where surges are severe, select a hose that will increase the safety factor.

## Operating temperatures

Operating temperatures specified refer to maximum temperature of the fluid or gases being conveyed (with peaks up to 120°C. Continuous operation at or near maximum rated temperatures will materially reduce the service life of the hose. Refer to Pirtek for advice on permissible operating temperatures for fluids other than general purpose mineral oils in hydraulic hoses.

Very high or low ambient (outside of hose) temperatures will affect cover and reinforcement materials, thus influencing the life of the hose.

## Bend radius

Recommended minimum bend radii are based on maximum operating pressures with no flexing of the hose.

## Vibration and flexing

Hose lines are designed to withstand maximum vibration and flexing.

## Volumetric expansion

Hose is normally manufactured with a neutral braid angle to reduce volumetric expansion.

## Gaseous fluid systems

High pressure gaseous systems are very hazardous. Hose lines should be adequately protected from external shock and mechanical or chemical damage. They should also be suitably protected to prevent whiplash action in the event of failure for any reasons. It is recommended to increase the safety factor when dealing with gaseous fluid systems.

**Pirtek hose & associated products have not been tested or certified for use on aircraft and therefore must not be used in such applications.**

## Ambient temperatures

# Hose Installation Guide

Particular care must be taken to avoid certain conditions when installing hose assemblies. These conditions might arise from :

- 1. Changes in length
- 2. Proximity of high temperature sources
- 3. Twisting / torsion
- 4. Bends in tight locations
- 5. Rubbing / abrasion
- 6. Improper hose movement
- 7. Longitudinal pull on hose ends (vertical drops or spring tensioned reels)

Some situations can result in violation of the hose technical specifications unless the operating conditions of the hose are fully appreciated.

Take note of the examples given overleaf to avoid problems and premature hose failure.

# A Word About Twist

Only 7° of angular twist in an assembly can reduce the expected hose life by up to 80%. Pay particular attention to factors that induce twist and learn to recognise them in the field. Take note also of the allowable tolerance for orientation of elbow fittings (page A 08) when assembling hoses.

# HOSE INSTALLATION GUIDELINES



Length may vary +2% to -4% when pressure is applied.  
Allow enough slack to accommodate this movement.  
Important to note, that the metal hose fittings are not part of the flexible portion. Allow ample free length for flexing.



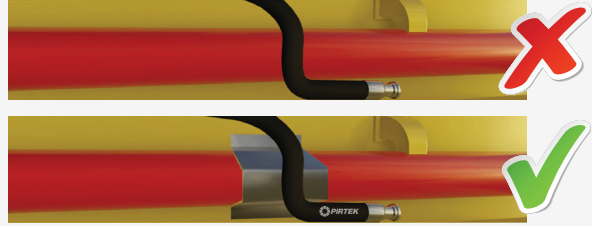
Use the layline to determine that no twist has been induced when tightening. Use 2 spanners to counteract twist.



Ensure that bending of a hose occurs in the same plane as the movement of the attachment point to avoid induced twist.



Ensure to have a straight section before bending commences. Using too small a bend radius will greatly reduce flow hose life.



Avoid hot manifolds etc. where possible or isolate with Fire Sleeve or other protective means.



Use elbows and adaptors to relieve strain for correct installations allowing easier access and maintenance.

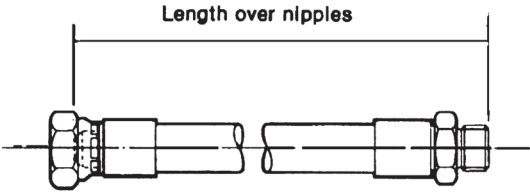
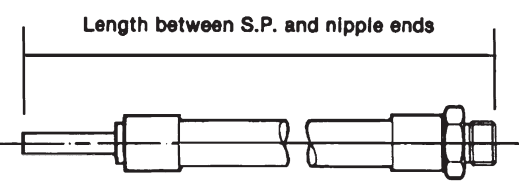
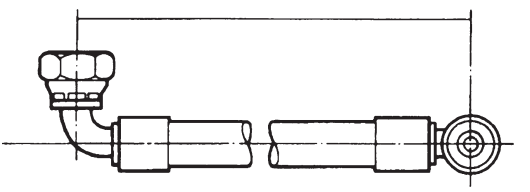
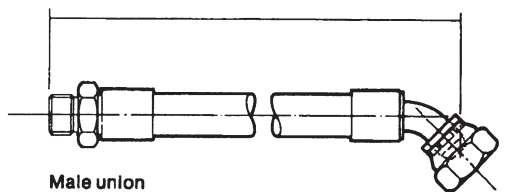
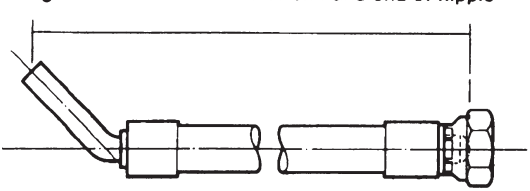
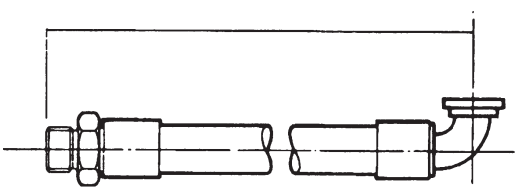
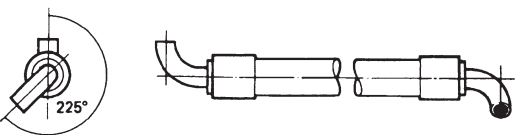


Avoid sharp corners and ensure a straight section of 1.5 the diameter before bending commences.  
Use Pirtek Spiral Guard, Das Sleeve or Steel Spring Guard to protect your hose in operating conditions.



Use clamps to support long runs or keep the hose away from moving parts. Clamps must not be allowed to move as may cause abrasion.  
Important to note, when using clamps keep clear of bends.

# How to measure Pirtek assemblies

|                                                                                                                                                                                                  |                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Length over nipples</p> <p>Swivel female and male union</p>                                                 |  <p>Length between S.P. and nipple ends</p> <p>Straight standpipe      Male union</p>                               |
|  <p>Length between centre lines of angle and banjo</p> <p>Swivel female 90° swept union      Banjo coupling</p> |  <p>Length between male nipple and centre of female nipple</p> <p>Male union      Swivel female 45° swept union</p> |
|  <p>Length between centre line of S.P. and end of nipple</p> <p>45° standpipe      Swivel female union</p>     |  <p>Length between centre of angle and nipple end</p> <p>Male union      90° SAE flange</p>                        |
| <p>Standard Tolerances</p> <p>Assembly length</p> <p>0mm – 305mm ± 3mm</p> <p>305mm – 457mm ± 4mm</p> <p>457mm – 914mm ± 6mm</p> <p>914mm upwards ±1%</p> <p>Elbow angle ±3°</p>                 |  <p>225°</p>                                                                                                      |

## Angular Relationships

Hold the assembly so that you can look along the length of the hose and with the fitting furthest away from you in the vertical position. Measure the angle between the vertical fitting and the one nearest to you in a clockwise direction. Relationship can then be expressed from 0° to 360°.

*If the angle is not given, the elbows are positioned at 0°.*

### HOSE SIZE TERMINOLOGY (HOSE SIZE REFERS TO THE INSIDE DIAMETER)

| HOSE SIZE | DASH SIZE | MINE TERMINOLOGY | METRIC SIZE | DN SIZE |
|-----------|-----------|------------------|-------------|---------|
| 1/4"      | -04       | NO 4             | 6 MM        | DN6     |
| 3/8"      | -06       | NO 6             | 10 MM       | DN10    |
| 1/2"      | -08       | NO 8             | 13 MM       | DN13    |
| 5/8"      | -10       | NO 10            | 16 MM       | DN16    |
| 3/4"      | -12       | NO 12            | 20 MM       | DN20    |
| 1"        | -16       | NO 16            | 25 MM       | DN25    |
| 1 1/4"    | -20       | NO 20            | 32 MM       | DN32    |
| 1 1/2"    | -24       | NO 24            | 40 MM       | DN40    |
| 2"        | -32       | NO 32            | 50 MM       | DN50    |
| 2 1/2"    | -40       | NO 40            | 63.5 MM     | DN63    |
| 3"        | -48       | NO 48            | 75 MM       | DN75    |

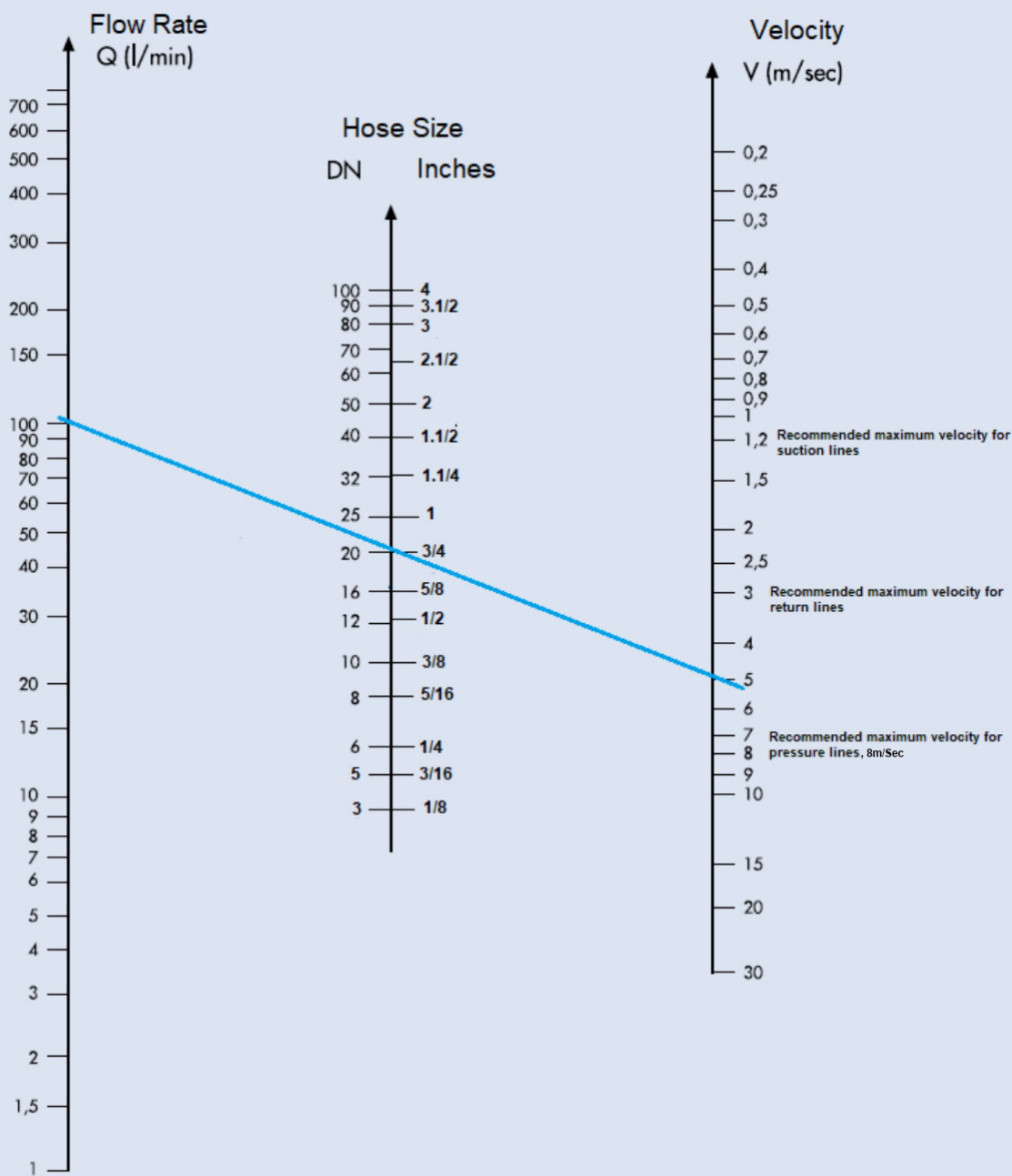
This page is part of a complete catalogue containing technical and safety data.  
All data must be reviewed when selecting a product.  
Pirtek reserve the right to change technical specifications without notice

# NORMOGRAPH FOR DETERMINATION OF NOMINAL HOSE DIAMETER

This normograph provides a guide for the determination of the nominal diameter (DN) required for a hose. It is always recommended to use a larger size hose if there is doubt as to the flow, but never a smaller size than indicated.

## Example:

The flow rate of your system is 100 l/min (litres per minute).  
 Connect your straight edge from the 100 in the flow rate column to under the recommended maximum velocity range for pressure lines.  
 Ensure the straight line does not go over the recommended velocity index.  
 The straight edge line intersects at DN20 (3/4"), so the minimum hose size to use is 3/4".



# Hose Pressure Flow Chart

Pressure drop in psi (pounds per square inch) LPM (litres per minute) / for 3 metres of hose (smooth bore) without fittings.

Fluid specification:

Specific gravity = .85; Viscosity =  $\nu$  = 20 centistokes (C.S.), (20 C.S. = 97 S.S.U.); Ref: MIL-H 5606, 70°F. (+21°C).

Litres per minute

| "Hose ID (inches)" | 3/16 | 1/4 | 5/16 | 3/8 | 13/32 | 1/2 | 5/8 | 3/4 | 7/8 | 1   | 1 1/8 | 1 1/4 | 1 3/8 | 1 1/2 | 1 13/16 | 2   |
|--------------------|------|-----|------|-----|-------|-----|-----|-----|-----|-----|-------|-------|-------|-------|---------|-----|
| 0.9                | 10   | 3.1 |      |     |       |     |     |     |     |     |       |       |       |       |         |     |
| 1.9                | 19   | 6   | 2.7  |     |       |     |     |     |     |     |       |       |       |       |         |     |
| 3.8                | 40   | 12  | 5.5  | 2.4 |       |     |     |     |     |     |       |       |       |       |         |     |
| 7.6                | 95   | 24  | 10   | 4.8 | 3.5   |     |     |     |     |     |       |       |       |       |         |     |
| 11.4               | 185  | 46  | 17   | 7   | 5     | 2.2 |     |     |     |     |       |       |       |       |         |     |
| 15.1               |      | 78  | 29   | 12  | 8     | 3   | 1.2 |     |     |     |       |       |       |       |         |     |
| 18.9               |      | 120 | 44   | 18  | 12    | 4.5 | 1.6 | .72 |     |     |       |       |       |       |         |     |
| 30.3               |      |     | 95   | 39  | 26    | 10  | 3.6 | 1.4 | .60 |     |       |       |       |       |         |     |
| 37.9               |      |     |      | 59  | 40    | 15  | 5.7 | 2   | 1   | .55 |       |       |       |       |         |     |
| 45.4               |      |     |      | 80  | 52    | 20  | 7.2 | 2.6 | 1.5 | .75 | .43   |       |       |       |         |     |
| 56.8               |      |     |      |     | 75    | 30  | 10  | 4.2 | 2.2 | 1.2 | .67   | .38   |       |       |         |     |
| 68.1               |      |     |      |     | 107   | 40  | 15  | 6.3 | 3   | 1.5 | .70   | .55   | .35   |       |         |     |
| 75.7               |      |     |      |     |       | 49  | 19  | 8   | 3.4 | 2   | 1.1   | .65   | .43   | .27   |         |     |
| 94.6               |      |     |      |     |       | 72  | 26  | 11  | 5.5 | 3   | 1.6   | 1     | .64   | .40   | .17     |     |
| 113.5              |      |     |      |     |       |     | 34  | 14  | 7   | 3.6 | 2.2   | 1.3   | .80   | .52   | .22     | .14 |
| 132.5              |      |     |      |     |       |     | 47  | 19  | 9.5 | 5   | 2.8   | 1.7   | 1.1   | .70   | .27     | .18 |
| 151.4              |      |     |      |     |       |     |     | 25  | 12  | 6.5 | 3.4   | 2.2   | 1.4   | .90   | .38     | .24 |
| 189.3              |      |     |      |     |       |     |     | 36  | 17  | 9   | 5.3   | 3.3   | 2     | 1.3   | .54     | .35 |
| 227.1              |      |     |      |     |       |     |     | 50  | 23  | 12  | 7.5   | 4.4   | 2.8   | 1.8   | .75     | .45 |
| 265.0              |      |     |      |     |       |     |     |     | 31  | 17  | 9.3   | 6     | 3.8   | 2.4   | 1       | .65 |
| 302.8              |      |     |      |     |       |     |     |     | 38  | 21  | 12    | 7.1   | 4.6   | 3     | 1.2     | .76 |
| 340.7              |      |     |      |     |       |     |     |     | 49  | 27  | 15    | 9     | 5.9   | 3.8   | 1.5     | 1   |
| 378.5              |      |     |      |     |       |     |     |     |     | 33  | 19    | 12    | 7     | 4.7   | 1.9     | 1.3 |
| 567.8              |      |     |      |     |       |     |     |     |     | 60  | 36    | 22    | 13    | 8.5   | 3.4     | 2.2 |
| 757.1              |      |     |      |     |       |     |     |     |     |     |       | 36    | 23    | 15    | 6       | 3.9 |
| 946.4              |      |     |      |     |       |     |     |     |     |     |       | 54    | 33    | 22    | 8.5     | 5.3 |
| 1135.6             |      |     |      |     |       |     |     |     |     |     |       |       | 45    | 29    | 12      | 7.5 |
| 1514.2             |      |     |      |     |       |     |     |     |     |     |       |       |       | 51    | 21      | 14  |
| 1892.7             |      |     |      |     |       |     |     |     |     |     |       |       |       |       | 32      | 20  |

# Formulas and Conversion Factors for Fluid-Power Use

| Quantity      | Metric Units                                    | U.S. Customary Units                         | From Metric to U.S. Units                          | From U.S. to Metric Units                        |
|---------------|-------------------------------------------------|----------------------------------------------|----------------------------------------------------|--------------------------------------------------|
| Area          | Square centimetres (cm <sup>2</sup> )           | Square inches (ins <sup>2</sup> )            | cm <sup>2</sup> x 0.155 = ins <sup>2</sup>         | ins <sup>2</sup> x 6.452 = cm <sup>2</sup>       |
| Length        | Metres (mt)                                     | Feet (ft)                                    | mt x 3.2081                                        | ft x 0.305 = mt                                  |
| Weight        | Kilograms (Kg)                                  | Pounds (lbs)                                 | Kg x 2.2046 = lbs                                  | lbs x 0.4356 = Kg                                |
| Volume        | Cubic Centimetres (cm <sup>3</sup> )            | Cubic Feet (ft <sup>3</sup> )                | cm <sup>3</sup> x 0.061 = ft <sup>3</sup>          | ft <sup>3</sup> x 16.39 = cm <sup>3</sup>        |
|               | Litres (lt)                                     | U.S. Gallons (gal)                           | lt x 0.2541 = U.S. gal                             | U.S. gal x 3.7 = lt                              |
|               | Litres (lt)                                     | U.K. Gallons (gal)                           | lt x 0.2198 = U.K. gal                             | U.K. gal x 4.55 = lt                             |
| Power         | Kilowatts (KW)                                  | Horsepower (HP)                              | HP x 0.7457 = KW                                   | KW x 1.3410 = HP                                 |
| Frequency     | Hertz (Hz)                                      | Cycles / sec (cps)                           | Hz = cps                                           | cps = Hz                                         |
| Load (Torque) | Metre Kilograms Kg.m                            | Foot Pounds (ft.lbs)                         | Kg.m x 7.233 = ft.lbs                              | ft.lbs x 0.1383 = Kg.m                           |
| Pressure      | Bar (bar)                                       | Pounds / square inch (psi)                   | bar x 14.50 = psi                                  | psi x 0.0689 = bar                               |
|               | Kilopascal (kPa)                                | Pounds / square inch (psi)                   | kPa x 0.145 = psi                                  | psi x 6.8948 = kPa                               |
|               | Atmospheres (Atm)                               | Pounds / square inch (psi)                   | Atm x 14.70 = psi                                  | psi x 0.068 = Atm                                |
| Density       | Gram / cubic centimetre (gr / cm <sup>3</sup> ) | Pounds / cubic inch (lb / ins <sup>3</sup> ) | gr/cm <sup>3</sup> x 0.03613 = lb/ins <sup>3</sup> | lb/ins <sup>3</sup> x 27.68 = gr/cm <sup>3</sup> |
| Temperature   | Degrees Celsius (°C)                            | Degrees Fahrenheit (°F)                      | (C° = F°-32) / 1.8                                 | F° = (C° x 1.8) + 32                             |

# Inches Conversion to Millimetres

| Inches    |          | Millimetres |
|-----------|----------|-------------|
| Fractions | Decimals |             |
| 1/64      | 0.01563  | 0.3970      |
| 1/32      | 0.03125  | 0.7940      |
| 3/64      | 0.04688  | 1.1910      |
| 1/16      | 0.06250  | 1.5880      |
| 5/64      | 0.07813  | 1.9840      |
| 3/32      | 0.09375  | 2.3810      |
| 7/64      | 0.10938  | 2.7780      |
| 1/8       | 0.12500  | 3.1750      |
| 9/64      | 0.14063  | 3.5720      |
| 5/32      | 0.15625  | 3.9690      |
| 11/64     | 0.17188  | 4.3660      |
| 3/16      | 0.18750  | 4.7630      |
| 13/64     | 0.20313  | 5.1590      |
| 7/32      | 0.21875  | 5.5560      |
| 15/64     | 0.23438  | 5.9530      |
| 1/4       | 0.25000  | 6.3500      |
| 17/64     | 0.26563  | 6.7470      |
| 9/32      | 0.28125  | 7.1440      |
| 19/64     | 0.29688  | 7.5410      |
| 5/16      | 0.31250  | 7.9380      |
| 21/64     | 0.32813  | 8.3340      |
| 11/32     | 0.34375  | 8.7310      |

| Inches    |          | Millimetres |
|-----------|----------|-------------|
| Fractions | Decimals |             |
| 23/64     | 0.35938  | 9.12800     |
| 3/8       | 0.37500  | 9.52500     |
| 25/64     | 0.39063  | 9.92200     |
| 13/32     | 0.40625  | 10.31900    |
| 27/64     | 0.42188  | 10.71600    |
| 7/16      | 0.43750  | 11.11300    |
| 29/64     | 0.45313  | 11.50900    |
| 15/32     | 0.46875  | 11.90600    |
| 31/64     | 0.48438  | 12.30300    |
| 1/2       | 0.50000  | 12.70000    |
| 33/64     | 0.51563  | 13.09700    |
| 17/32     | 0.53125  | 13.49400    |
| 35/64     | 0.54688  | 13.89100    |
| 9/16      | 0.56250  | 14.28800    |
| 37/64     | 0.57813  | 14.68400    |
| 19/32     | 0.59375  | 15.08100    |
| 39/64     | 0.60938  | 15.47800    |
| 5/8       | 0.62500  | 15.87500    |
| 41/64     | 0.64063  | 16.27200    |
| 21/32     | 0.65625  | 16.66900    |
| 43/64     | 0.67188  | 17.06600    |
| 11/16     | 0.68750  | 17.46300    |

| Inches    |          | Millimetres |
|-----------|----------|-------------|
| Fractions | Decimals |             |
| 45/64     | 0.70313  | 17.85900    |
| 23/32     | 0.71875  | 18.25600    |
| 47/64     | 0.73438  | 18.65300    |
| 3/4       | 0.75000  | 19.05000    |
| 49/64     | 0.76563  | 19.44700    |
| 25/32     | 0.78125  | 19.84400    |
| 51/64     | 0.79688  | 20.24100    |
| 13/16     | 0.81250  | 20.63800    |
| 53/64     | 0.82813  | 21.03400    |
| 27/32     | 0.84375  | 21.43100    |
| 55/64     | 0.85938  | 21.82800    |
| 7/8       | 0.87500  | 22.22500    |
| 57/64     | 0.89063  | 22.62200    |
| 29/32     | 0.90625  | 23.01900    |
| 59/64     | 0.92188  | 23.41600    |
| 15/16     | 0.93750  | 23.81300    |
| 61/64     | 0.95313  | 24.20900    |
| 31/32     | 0.96875  | 24.60600    |
| 63/64     | 0.98438  | 25.00300    |
| 1         | 1.00000  | 25.40000    |

# Pressure Conversion Factors

| BAR TO P.S.I. |             |             |                      |         |
|---------------|-------------|-------------|----------------------|---------|
| Bar           | Kilopascals | Megapascals | Kg / cm <sup>2</sup> | PSI     |
| 1             | 100         | 0.1         | 1.02                 | 14.5    |
| 2             | 200         | 0.2         | 2.04                 | 29.0    |
| 3             | 300         | 0.3         | 3.06                 | 43.5    |
| 4             | 400         | 0.4         | 4.08                 | 58.0    |
| 5             | 500         | 0.5         | 5.10                 | 72.5    |
| 6             | 600         | 0.6         | 6.12                 | 87.0    |
| 7             | 700         | 0.7         | 7.14                 | 101.5   |
| 8             | 800         | 0.8         | 8.16                 | 116.0   |
| 9             | 900         | 0.9         | 9.18                 | 130.5   |
| 10            | 1,000       | 1           | 10.20                | 145.0   |
| 20            | 2,000       | 2           | 20.40                | 290.1   |
| 30            | 3,000       | 3           | 30.60                | 435.1   |
| 40            | 4,000       | 4           | 40.80                | 580.2   |
| 50            | 5,000       | 5           | 51.00                | 725.2   |
| 60            | 6,000       | 6           | 61.20                | 870.2   |
| 70            | 7,000       | 7           | 71.40                | 1015.3  |
| 80            | 8,000       | 8           | 81.60                | 1160.3  |
| 90            | 9,000       | 9           | 91.80                | 1305.4  |
| 100           | 10,000      | 10          | 102.00               | 1450.4  |
| 200           | 20,000      | 20          | 204.00               | 2900.8  |
| 300           | 30,000      | 30          | 306.00               | 4351.2  |
| 400           | 40,000      | 40          | 408.00               | 5801.6  |
| 500           | 50,000      | 50          | 510.00               | 7252.0  |
| 600           | 60,000      | 60          | 612.00               | 8702.4  |
| 700           | 70,000      | 70          | 714.00               | 10152.8 |
| 800           | 80,000      | 80          | 816.00               | 11603.2 |
| 900           | 90,000      | 90          | 918.00               | 13053.6 |
| 1000          | 100,000     | 100         | 1020.00              | 14504.0 |
| 2000          | 200,000     | 200         | 2040.00              | 29008.0 |
| 3000          | 300,000     | 300         | 3060.00              | 43512.0 |

| P.S.I. TO BAR |             |             |                      |         |
|---------------|-------------|-------------|----------------------|---------|
| PSI           | Kilopascals | Megapascals | Kg / cm <sup>2</sup> | BAR     |
| 10            | 69          | 0.069       | 0.7                  | 0.69    |
| 20            | 138         | 0.138       | 1.4                  | 1.38    |
| 30            | 207         | 0.207       | 2.1                  | 2.07    |
| 40            | 276         | 0.276       | 2.8                  | 2.76    |
| 50            | 345         | 0.345       | 3.5                  | 3.45    |
| 60            | 414         | 0.414       | 4.2                  | 4.14    |
| 70            | 483         | 0.483       | 4.9                  | 4.83    |
| 80            | 552         | 0.552       | 5.6                  | 5.52    |
| 90            | 621         | 0.621       | 6.3                  | 6.21    |
| 100           | 689         | 0.689       | 7.0                  | 6.89    |
| 200           | 1379        | 1.379       | 14.1                 | 13.79   |
| 300           | 2068        | 2.068       | 21.1                 | 20.68   |
| 400           | 2758        | 2.758       | 28.1                 | 27.58   |
| 500           | 3447        | 3.447       | 35.2                 | 34.47   |
| 600           | 4137        | 4.137       | 42.2                 | 41.37   |
| 700           | 4826        | 4.826       | 49.2                 | 48.26   |
| 800           | 5516        | 5.516       | 56.2                 | 55.16   |
| 900           | 6205        | 6.205       | 63.3                 | 62.05   |
| 1000          | 6895        | 6.895       | 70.3                 | 68.95   |
| 2000          | 13790       | 13.790      | 140.6                | 137.90  |
| 3000          | 20684       | 20.684      | 210.9                | 206.84  |
| 4000          | 27579       | 27.579      | 281.2                | 275.79  |
| 5000          | 34474       | 34.474      | 351.5                | 344.74  |
| 6000          | 41369       | 41.369      | 421.8                | 413.69  |
| 7000          | 48263       | 48.263      | 492.1                | 482.63  |
| 8000          | 55158       | 55.158      | 562.5                | 551.58  |
| 9000          | 62053       | 62.053      | 632.8                | 620.53  |
| 10000         | 68948       | 68.948      | 703.1                | 689.48  |
| 20000         | 137895      | 137.895     | 1406.1               | 1378.95 |
| 30000         | 206843      | 206.843     | 2109.2               | 2068.43 |

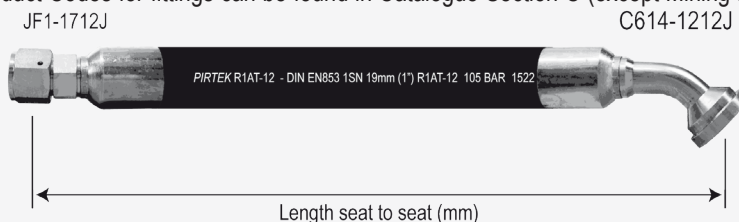
# Thread Identification

## Thread Identification

|                                               | Page Number |                                                      | Page Number |
|-----------------------------------------------|-------------|------------------------------------------------------|-------------|
| Torque and Threaded Connections               | 15          | Japanese Industrial Standard Metric Male (Komatsu)   | 25          |
| British Standard Pipe Taper Male              | 16          | Japanese Industrial Standard Metric Female (Komatsu) | 25          |
| British Standard Pipe Parallel Male           | 16          | Staple Lock Male                                     | 26          |
| British Standard Pipe Parallel Female         | 17          | Staple Lock Female                                   | 26          |
| British Standard Pipe Taper Female            | 17          | High Pressure Staple Lock Male                       | 27          |
| Joint Industry Council Female Swivel          | 18          | High Pressure Staple Lock Female                     | 27          |
| Joint Industry Council Male                   | 18          | Prange SKV                                           | 28          |
| Unified National 'O' Ring Male                | 19          | Prange SSKV                                          | 29          |
| Society of Automotive Engineers (SAE) Male    | 19          | SAE J518 Code 61 Flange                              | 30          |
| SAE Inverted Flare Female                     | 20          | SAE J518 Code 62 Flange                              | 30          |
| SAE Inverted Flare Male                       | 20          | Caterpillar® Flange                                  | 30          |
| National Pipe Taper Fuel Male                 | 21          | Komatsu® Flange                                      | 30          |
| National Pipe Straight Mechanical Female      | 21          | 'O' Ring Face Seal Male                              | 31          |
| DKL Metric Light Male                         | 22          | 'O' Ring Face Seal Female                            | 31          |
| DKL Metric Light Female Globe Seal            | 22          | GAZ French Metric Male                               | 32          |
| DKS Metric Heavy Male                         | 23          | GAZ French Metric Female                             | 32          |
| DKS Metric Heavy Female (Globe & O ring Seal) | 23          | Kobelco Metric Male                                  | 33          |
| Japanese Industrial Standard BSPP Male        | 24          | Kobelco Metric Female                                | 33          |
| Japanese Industrial Standard BSPP Female      | 24          |                                                      |             |

## ORDERING PIRTEK ASSEMBLIES

Should you wish to describe a Pirtek hose assembly in an abbreviated form, please use the following format. A forward slash is used to separate each field. Product Codes for fittings can be found in Catalogue Section C (except Mining Fittings Section U)



If spiral guard SSG-025 were fitted over the full length, the designation would be:

R1AT-12 / JF1-1712J / C614-1212J / 1200 / SSG-025

If both ends were fitted with the 45° flanged elbow set in alignment, the designation would appear:

R1AT-12 / C614-1212J / 1200 / 0

**Generic Pattern : Hose / End A / End B / Length / Protection / Angle**

**Pirtek hose & associated products have not been tested or certified for use on aircraft and therefore must not be used in such applications.**

## Torque and Threaded Connections

BSPT and NPT tapered thread assembly requirements usually dictate a number of wrench flats from hand tight. The hand tight position is described in the British Standard for BSPT as Gauge Length. Table 1 at right summarises the recommended parameters when tightening these fittings. Note that a thread sealing compound is generally used with both these fittings in order to achieve a seal, and so the use of a torque figure for assembly can play no meaningful role.

Thread Identification Tables commencing on page 16 document the recommended tightening torques for JIC and UNO type fittings, since correct torque is essential to minimize leaks from them. Too little torque will preclude proper seat contact, whilst too much can cause O-Ring extrusion (in the case of UNO), splitting of the female JIC seat, damage to the nut, or at the very least damage through cold working of the metal in the contact area. Since thread sealants are not required with these fittings, torque can adopt a more meaningful role in the assembly process. However, in field installation work, suitable torque wrenches are rarely available, and it is usual to fall back to the use of a number of wrench flats from wrench resistance to achieve the desired result. For the case of UNF style fittings, the tabulation at right may assist in achieving the correct torque during assembly if a torque wrench is unavailable during installation. The procedure is:

1. Tighten the nut with the fingers until a distinct bottoming out on the seat can be felt.
2. Use a marking system (permanent marker or centre punch) to provide reference points on the opposing flats of the nut and connector.
3. Tighten the nut with a spanner to rotate it the tabulated number of hex flats, using the reference marks as a guide.

**Note: The torque Values shown on the following pages are based on plated carbon steel fittings.**

| "Thread BSPT" | "Tube Size" | "Gauge Length Turns of Thread" | "Max. Turns of Thread inc. Fitting Allowance" | "Min. Recommended Thread Engagement mm" |
|---------------|-------------|--------------------------------|-----------------------------------------------|-----------------------------------------|
| 1/8 - 28      | 2           | 43/8                           | 71/8                                          | 5.8                                     |
| 1/4 - 19      | 4           | 41/2                           | 71/4                                          | 6.4                                     |
| 3/8 - 19      | 6           | 43/4                           | 71/2                                          | 8.6                                     |
| 1/2 - 14      | 8           | 41/2                           | 71/4                                          | 8.6                                     |
| 3/4 - 14      | 12          | 51/4                           | 8                                             | 11.7                                    |
| 1 - 11        | 16          | 41/2                           | 71/4                                          | 11.7                                    |
| 1.1/4 - 11    | 20          | 51/2                           | 81/4                                          | 17                                      |
| 1.1/2 - 11    | 24          | 51/2                           | 81/4                                          | 18                                      |
| 2 - 11        | 32          | 67/8                           | 101/8                                         | 19.5                                    |

**Table 1 BSPT Thread Engagement**

Recommended Thread Engagement lengths for NPT fittings are the same as for BSPT

| Thread UNF | Tube Size | Torque Nm | No. of Hex Flats from Wrench Resistance |
|------------|-----------|-----------|-----------------------------------------|
| 7/16-20    | 4         | 15-16     | 2                                       |
| 1/2-20     | 5         | 19-21     | 2                                       |
| 9/16-18    | 6         | 24-28     | 1.1/2                                   |
| 3/4-16     | 8         | 49-53     | 1.1/2                                   |
| 7/8-14     | 10        | 77-85     | 1.1/2                                   |
| 1.1/16-12  | 12        | 107-119   | 1.1/4                                   |
| 1.3/16-12  | 14        | 127-140   | 1.1/4                                   |
| 1.5/16-12  | 16        | 147-154   | 1                                       |
| 1.5/8-12   | 20        | 172-181   | 1                                       |
| 1.7/8-12   | 24        | 215-226   | 1                                       |
| 2.1/2-12   | 32        | 332-350   | 1                                       |

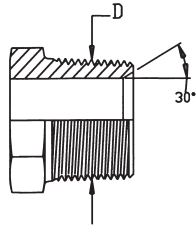
**Table 2 JIC / UNO Threads**

Note: Torque values given are for plated steel components without lubrication

This page is part of a complete catalogue containing technical and safety data.  
All data must be reviewed when selecting a product.  
Pirtek reserve the right to change technical specifications without notice

# Thread Identification

## BRITISH STANDARD PIPE TAPER MALE - (BSPT)

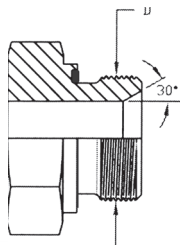


### Applicable Standards

Thread Form: AS 1722.1-1975, ISO 7

| Pipe Size | Dash Size | Nominal Thread Size & Pitch | Max Work Press (Bar) Adaptors | Max Work Press (Bar) Hose Fittings | Thread OD 'D' on Diagram |       |
|-----------|-----------|-----------------------------|-------------------------------|------------------------------------|--------------------------|-------|
|           |           |                             |                               |                                    | mm                       | in    |
| 1/8"      | 2         | 1/8" - 28                   | 690                           | 350                                | 9.73                     | 0.383 |
| 1/4"      | 4         | 1/4" - 19                   | 650                           | 350                                | 13.16                    | 0.518 |
| 3/8"      | 6         | 3/8" - 19                   | 550                           | 275                                | 16.67                    | 0.656 |
| 1/2"      | 8         | 1/2" - 14                   | 410                           | 275                                | 20.96                    | 0.825 |
| 5/8" *    | 10        | 5/8" - 14                   | 340                           | 210                                | 22.91                    | 0.902 |
| 3/4"      | 12        | 3/4" - 14                   | 340                           | 210                                | 26.45                    | 1.041 |
| 1"        | 16        | 1" - 11                     | 275                           | 210                                | 33.25                    | 1.309 |
| 1 1/4"    | 20        | 1 1/4" - 11                 | 200                           | 140                                | 41.91                    | 1.650 |
| 1 1/2"    | 24        | 1 1/2" - 11                 | 140                           | 140                                | 47.81                    | 1.882 |
| 2"        | 32        | 2" - 11                     | 140                           | 140                                | 59.62                    | 2.347 |

## BRITISH STANDARD PIPE PARALLEL MALE - (BSPP)

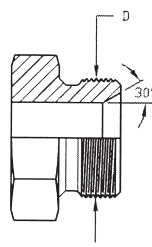


### Applicable Standards

Thread Form: AS 1722.2-1992, ISO 228

Seal: DIN 3852 Part 2 Form E

( ED Seal)

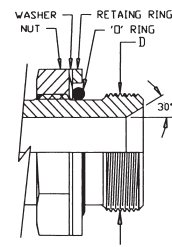


### Applicable Standards

Thread Form: AS 1722.2-1992, ISO 228

Seal: DIN 3852 Part 2 Form A

( Dowty Washer )



### Applicable Standards

Thread Form: AS 1722.2-1992, ISO 228

Seal: ISO 1179-3 Form G

( O-ring & Retaining ring )

| Pipe Size | Dash Size | Correct Torque (Nm) | Nominal Thread Size & Pitch | Max Work Press (Bar) Adaptors |      | Max Work Press (Bar) Hose Fittings | Thread OD 'D' on Diagram |       |
|-----------|-----------|---------------------|-----------------------------|-------------------------------|------|------------------------------------|--------------------------|-------|
|           |           |                     |                             | Fixed                         | Adj. |                                    | mm                       | ins   |
| 1/8"      | 2         | 20                  | 1/8" - 28                   | 600                           | 350  |                                    | 9.73                     | 0.383 |
| 1/4"      | 4         | 50                  | 1/4" - 19                   | 600                           | 400  | 630                                | 13.16                    | 0.518 |
| 3/8"      | 6         | 80                  | 3/8" - 19                   | 600                           | 400  | 550                                | 16.67                    | 0.656 |
| 1/2"      | 8         | 100                 | 1/2" - 14                   | 400                           | 350  | 430                                | 20.96                    | 0.825 |
| 5/8" *    | 10        | 120                 | 5/8" - 14                   | 400                           | 275  | 420                                | 22.91                    | 0.902 |
| 3/4"      | 12        | 200                 | 3/4" - 14                   | 400                           | 315  | 420                                | 26.45                    | 1.041 |
| 1"        | 16        | 380                 | 1" - 11                     | 400                           | 250  | 420                                | 33.25                    | 1.309 |
| 1 1/4"    | 20        | 500                 | 1 1/4" - 11                 | 380                           | 200  | 350                                | 41.91                    | 1.650 |
| 1 1/2"    | 24        | 600                 | 1 1/2" - 11                 | 380                           | 160  | 350                                | 47.81                    | 1.882 |
| 2"        | 32        | 750                 | 2" - 11                     | 250                           | 125  | 350                                | 59.62                    | 2.347 |

\* 5/8" Size is not subject to Standards

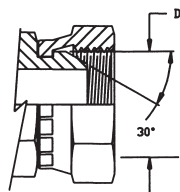
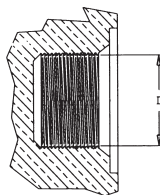
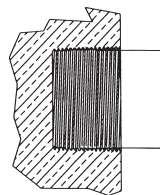
Note: The torque values given are for plated carbon steel components without lubrication.

# Thread Identification

## BRITISH STANDARD PIPE

### PARALLEL FEMALE - (BSPP)

### TAPER FEMALE - (BSPT)



#### Applicable Standards

Thread Form: AS 1722.2-1992, ISO 228

#### Applicable Standards

Thread Form: AS 1722.2-1992, ISO 228

Sealing area: DIN 3852 Part 2 Form X

#### Applicable Standards

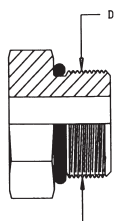
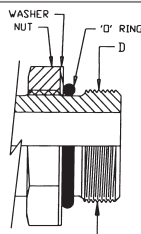
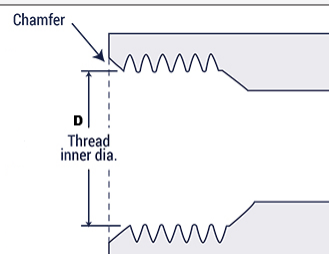
Thread Form: AS 1722.2-1992, ISO 228

| Pipe Size | Dash Size | Correct Torque (Nm) BSPP | Nominal Thread Size & Pitch | Max Work Press (Bar) Adaptors |        | Hose Fitting Bar | Thread ID 'D' on Diagram |       |
|-----------|-----------|--------------------------|-----------------------------|-------------------------------|--------|------------------|--------------------------|-------|
|           |           |                          |                             | Fixed                         | Swivel |                  | mm                       | ins   |
| 1/8"      | 2         | 20                       | 1/8" - 28                   | 550                           | 550    | 350              | 8.59                     | 0.338 |
| 1/4"      | 4         | 50                       | 1/4" - 19                   | 550                           | 550    | 630              | 11.46                    | 0.451 |
| 3/8"      | 6         | 80                       | 3/8" - 19                   | 520                           | 520    | 550              | 14.96                    | 0.589 |
| 1/2"      | 8         | 100                      | 1/2" - 14                   | 380                           | 380    | 430              | 18.65                    | 0.734 |
| 5/8" *    | 10        | 120                      | 5/8" - 14                   | 275                           | 275    | 420              | 20.6                     | 0.811 |
| 3/4"      | 12        | 200                      | 3/4" - 14                   | 275                           | 275    | 350              | 24.13                    | 0.95  |
| 1"        | 16        | 380                      | 1" - 11                     | 240                           | 240    | 350              | 30.3                     | 1.193 |
| 1 1/4"    | 20        | 500                      | 1 1/4" - 11                 | 200                           | 200    | 250              | 38.97                    | 1.534 |
| 1 1/2"    | 24        | 600                      | 1 1/2" - 11                 | 175                           | 175    | 210              | 44.86                    | 1.766 |
| 2"        | 32        | 750                      | 2" - 11                     | 140                           | 140    | 210              | 56.67                    | 2.231 |

\* 5/8" Size is not subject to Standards

Note: The torque values given are for plated carbon steel components without lubrication.

## UNIFIED NATIONAL O RING - (UNO)



#### Applicable Standards

Thread Form: SAE J1926-2, ISO 11926-2

#### Applicable Standards

Thread Form: SAE J1926-2, ISO 11926-2

Adjustable type

#### Applicable Standards

Thread Form: SAE J1926-1, ISO 11926-1

| Pipe Size | Dash Size | Correct Torque (Nm) | Nominal Thread Size & Pitch | Max Working Pressure Adaptors (Bar) |      | Hose Fittings Bar | Thread 'D' (mm) |       |
|-----------|-----------|---------------------|-----------------------------|-------------------------------------|------|-------------------|-----------------|-------|
|           |           |                     |                             | Fixed                               | Adj. |                   | OD              | ID    |
| 5         | 1/8"      | 8 - 9               | 5/16" - 24                  | 420                                 | 420  | -                 | 7.87            | 7.14  |
| 6         | 3/16"     | 11 - 12             | 3/8" - 24                   | 420                                 | 420  | -                 | 9.65            | 8.73  |
| 7         | 1/4"      | 18 - 20             | 7/16" - 20                  | 310                                 | 310  | 350               | 11.07           | 10.32 |
| 8         | 5/16"     | 23 - 26             | 1/2" - 20                   | 310                                 | 310  | 350               | 12.70           | 11.91 |
| 9         | 3/8"      | 29 - 33             | 9/16" - 18                  | 310                                 | 240  | 350               | 14.25           | 13.49 |
| 12        | 1/2"      | 49 - 53             | 3/4" - 16                   | 310                                 | 240  | 315               | 19.00           | 17.46 |
| 14        | 5/8"      | 59 - 64             | 7/8" - 14                   | 240                                 | 205  | 275               | 22.17           | 20.64 |
| 17        | 3/4"      | 93 - 102            | 1 1/16" - 12                | 240                                 | 205  | 275               | 26.95           | 25.4  |
| 21        | 1"        | 122 - 134           | 1 5/16" - 12                | 205                                 | 170  | 210               | 33.30           | 31.75 |
| 26        | 1 1/4"    | 198 - 218           | 1 5/8" - 12                 | 170                                 | 135  | 210               | 41.22           | 39.69 |
| 30        | 1 1/2"    | 209 - 231           | 1 7/8" - 12                 | 170                                 | 135  | 170               | 47.57           | 46.04 |
| 40        | 2"        | 296 - 325           | 2 1/2" - 12                 | 135                                 | 100  | -                 | 63.45           | 61.91 |

Note: The hex flats from finger tight method is recommended for UN-O fittings.



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All data must be reviewed when selecting a product.  
Pirtek reserve the right to change technical specifications without notice

# Thread Identification

## JOINT INDUSTRY COUNCIL - (JIC) - MALE

**Applicable Standards**

Thread Form: SAE J514

| Dash<br>Size | Nominal<br>Tube Size in | Correct Torque<br>Nm | Nominal Thread<br>Size & Pitch | Max Working Pressure (Bar)<br>Adaptors | Thread OD 'D' on Diagram |       |
|--------------|-------------------------|----------------------|--------------------------------|----------------------------------------|--------------------------|-------|
|              |                         |                      |                                |                                        | mm                       | in    |
| 05           | 1/8"                    | 8-9                  | 5/16" - 24                     | -                                      | 7.87                     | .310  |
| 06           | 3/16"                   | 11-12                | 3/8" - 24                      | -                                      | 9.65                     | .380  |
| 07           | 1/4"                    | 15-16                | 7/16" - 20                     | 595                                    | 11.07                    | .436  |
| 08           | 5/16"                   | 19-21                | 1/2" - 20                      | 595                                    | 12.70                    | .500  |
| 09           | 3/8"                    | 24-28                | 9/16" - 18                     | 490                                    | 14.25                    | .561  |
| 12           | 1/2"                    | 49-53                | 3/4" - 16                      | 420                                    | 19.00                    | .748  |
| 14           | 5/8"                    | 77-85                | 7/8" - 14                      | 385                                    | 22.17                    | .873  |
| 17           | 3/4"                    | 107-119              | 1 1/16" - 12                   | 280                                    | 26.95                    | 1.061 |
| 19           | 7/8"                    | 127-149              | 1 3/16" - 12                   | 280                                    | 30.10                    | 1.188 |
| 21           | 1"                      | 147-156              | 1 5/16" - 12                   | 245                                    | 33.30                    | 1.311 |
| 26           | 1 1/4"                  | 172-181              | 1 5/8" - 12                    | 245                                    | 41.22                    | 1.623 |
| 30           | 1 1/2"                  | 215-226              | 1 7/8" - 12                    | 145                                    | 47.57                    | 1.873 |
| 40           | 2"                      | 332-350              | 2 1/2" - 12                    | 120                                    | 63.45                    | 2.498 |

Note: The hex flats from finger tight method is recommended for 37° and 45° flare fittings. The torque values given are for plated carbon steel components without lubrication. See page 15

## JOINT INDUSTRY COUNCIL - (JIC) - FEMALE

Applicable Standards

Thread Form: SAE J514

| Dash<br>Size | Nominal<br>Tube Size in | Correct Torque<br>Nm | Nominal Thread<br>Size & Pitch | Max Working Pressure (Bar)<br>Adaptors | Thread ID 'D' on Diagram |       |
|--------------|-------------------------|----------------------|--------------------------------|----------------------------------------|--------------------------|-------|
|              |                         |                      |                                |                                        | mm                       | in    |
| 05           | 1/8"                    | 8-9                  | 5/16" - 24                     | -                                      | 6.85                     | .270  |
| 06           | 3/16"                   | 11-12                | 3/8" - 24                      | -                                      | 8.63                     | .340  |
| 07           | 1/4"                    | 15-16                | 7/16" - 20                     | 480                                    | 10.00                    | .394  |
| 08           | 5/16"                   | 19-21                | 1/2" - 20                      | 480                                    | 11.60                    | .457  |
| 09           | 3/8"                    | 24-28                | 9/16" - 18                     | 345                                    | 13.00                    | .512  |
| 12           | 1/2"                    | 49-53                | 3/4" - 16                      | 310                                    | 17.60                    | .693  |
| 14           | 5/8"                    | 77-85                | 7/8" - 14                      | 260                                    | 20.50                    | .807  |
| 17           | 3/4"                    | 107-119              | 1 1/16" - 12                   | 240                                    | 25.00                    | .985  |
| 19           | 7/8"                    | 127-140              | 1 3/16" - 12                   | 230                                    | 28.09                    | 1.106 |
| 21           | 1"                      | 147-154              | 1 5/16" - 12                   | 225                                    | 31.30                    | 1.233 |
| 26           | 1 1/4"                  | 172-181              | 1 5/8" - 12                    | 170                                    | 39.20                    | 1.544 |
| 30           | 1 1/2"                  | 215-226              | 1 7/8" - 12                    | 145                                    | 45.60                    | 1.796 |
| 40           | 2"                      | 332-350              | 2 1/2" - 12                    | 120                                    | 61.50                    | 2.422 |

Note: The hex flats from finger tight method is recommended for 37° and 45° flare fittings. The torque values given are for plated carbon steel components without lubrication. See page 15

## JOINT INDUSTRY COUNCIL- (JIC) - PIRTEK TEST PRESSURES (HOSE FITTINGS)



IMPORTANT SAFETY NOTE: Whilst Pirtek's thread termination pressure ratings exceed those stipulated in the respective Standards, discretion must be used prior to selection for appropriate applications. These test pressures correlate to material S12L14

| Dash Size | Nominal Tube Size in | Correct Torque Nm | Nominal Thread Size & Pitch | Actual Max Work Pressure (Bar) | Min. Burst Press (Bar) | No. of Wrench Flats from Wrench Resistance |
|-----------|----------------------|-------------------|-----------------------------|--------------------------------|------------------------|--------------------------------------------|
| 05        | 1/8"                 | 8-9               | 5/16" - 24                  | N/A                            | N/A                    |                                            |
| 06        | 3/16"                | 11-12             | 3/8" - 24                   | N/A                            | N/A                    |                                            |
| 07        | 1/4"                 | 15-16             | 7/16" - 20                  | 420 *c                         | 1680                   | 2                                          |
| 08        | 5/16"                | 19-21             | 1/2" - 20                   | 420 *c                         | 1680                   | 2                                          |
| 09        | 3/8"                 | 24-28             | 9/16" - 18                  | 420 *c                         | 1680                   | 1.1/2                                      |
| 12        | 1/2"                 | 49-53             | 3/4" - 16                   | 420 *c                         | 1680                   | 1.1/2                                      |
| 14        | 5/8"                 | 77-85             | 7/8" - 14                   | 420 *c                         | 1680                   | 1.1/2                                      |
| 17        | 3/4"                 | 107-119           | 1 1/16" - 12                | 420 *c                         | 1680                   | 1.1/4                                      |
| 19        | 7/8"                 | 127-140           | 1 3/16" - 12                | 420 *c                         | 1680                   | 1.1/4                                      |
| 21        | 1"                   | 147-154           | 1 5/16" - 12                | 420 *w                         | 1680                   | 1                                          |
| 26        | 1 1/4"               | 172-181           | 1 5/8" - 12                 | 350 *w                         | 1400                   | 1                                          |
| 30        | 1 1/2"               | 215-226           | 1 7/8" - 12                 | 350 *w                         | 1400                   | 1                                          |
| 40        | 2"                   | 332-350           | 2 1/2" - 12                 | 250 *w                         | 1000                   | 1                                          |

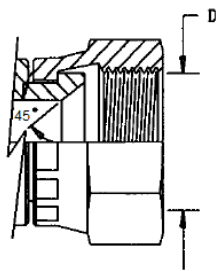
\*c = Crimped Nut \*w = Wire Nut

Note: The hex flats from finger tight method is recommended for 37° and 45° flare fittings. The torque values given are for plated carbon steel components without lubrication. See page 15

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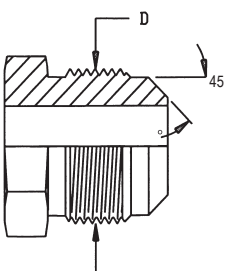
# Thread Identification

## SOCIETY OF AUTOMOTIVE ENGINEERS - (SAE) - FEMALE

|  <p><b>Applicable Standards</b><br/>Thread Form: SAE J512</p> | Dash Size | Nominal Tube Size in | Nominal Thread Size & Pitch | Correct Torque (NM) | Max Working Pressure Hose Fitting (Bar) | Thread OD 'D' on Diagram |      |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------|-----------------------------|---------------------|-----------------------------------------|--------------------------|------|
|                                                                                                                                                | 5         | 1/8"                 | 5/16" - 24                  | 8-9                 | -                                       | 6.85                     | .270 |
|                                                                                                                                                | 6         | 3/16"                | 3/8" - 24                   | 11-12               | -                                       | 8.63                     | .340 |
|                                                                                                                                                | 7         | 1/4"                 | 7/16" - 20                  | 15-16               | 450                                     | 11.60                    | .394 |
|                                                                                                                                                | 8         | 5/16"                | 1/2" - 20                   | 19-21               | 450                                     | 11.60                    | .457 |
|                                                                                                                                                | 10        | 3/8"                 | 5/8" - 18                   | 22-24               | 450                                     | 14.20                    | .560 |
|                                                                                                                                                | 12        | 1/2"                 | 3/4" - 16                   | 49-53               | 420                                     | 17.60                    | .693 |
|                                                                                                                                                | 14        | 5/8"                 | 7/8" - 14                   | 77-85               | 420                                     | 20.50                    | .807 |
|                                                                                                                                                | 17        | 3/4"                 | 1. 1/16" - 14               | 107-119             | 420                                     | 25.00                    | .985 |
|                                                                                                                                                | 20        | 7/8"                 | 1. 1/4" - 12                | -                   | -                                       | -                        | -    |
|                                                                                                                                                | 22        | 1"                   | 1. 3/8" - 12                | -                   | -                                       | -                        | -    |

Note: The hex flats from finger tight method is recommended for 37° and 45° flare fittings.

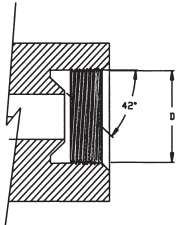
## SOCIETY OF AUTOMOTIVE ENGINEERS - (SAE) - MALE

|  <p><b>Applicable Standards</b><br/>Thread Form: SAE J512</p> | Dash Size | Nominal Tube Size in | Nominal Thread Size & Pitch | Maximum Working Pressure (Bar) |       | Hose Fitting Bar | Thread OD 'D' on Diagram |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------|-----------------------------|--------------------------------|-------|------------------|--------------------------|------|
|                                                                                                                                                 |           |                      |                             | Steel                          | Brass |                  | mm                       | in   |
|                                                                                                                                                 | 5         | 1/8"                 | 5/16" - 24                  | 345                            | 237   | -                | 7.87                     | 0.31 |
|                                                                                                                                                 | 6         | 3/16"                | 3/8" - 24                   | 345                            | 221   | -                | 9.65                     | 0.38 |
|                                                                                                                                                 | 7         | 1/4"                 | 7/16" - 20                  | 310                            | 162   | 410              | 11.07                    | 0.44 |
|                                                                                                                                                 | 8         | 5/16"                | 1/2" - 20                   | 275                            | 126   | 350              | 12.70                    | 0.50 |
|                                                                                                                                                 | 10        | 3/8"                 | 5/8" - 18                   | 275                            | 102   | 350              | 15.85                    | 0.62 |
|                                                                                                                                                 | 12        | 1/2"                 | 3/4" - 16                   | 275                            | 74    | 350              | 19.00                    | 0.75 |
|                                                                                                                                                 | 14        | 5/8"                 | 7/8" - 14                   | 210                            | 48    | 350              | 22.17                    | 0.87 |
|                                                                                                                                                 | 17        | 3/4"                 | 1. 1/16" - 14               | 210                            | -     | 350              | 26.95                    | 1.06 |
|                                                                                                                                                 | 20        | 7/8"                 | 1. 1/4" - 12                | 170                            | -     | -                | 29.46                    | 1.16 |
|                                                                                                                                                 | 22        | 1"                   | 1. 3/8" - 12                | 170                            | -     | -                | 35.05                    | 1.38 |

Note: The hex flats from finger tight method is recommended for 37° and 45° flare fittings.

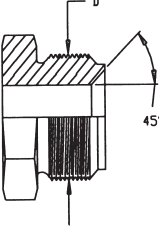
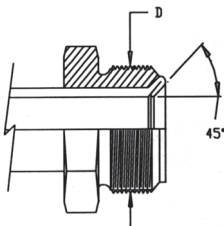
# Thread Identification

## SOCIETY OF AUTOMOTIVE ENGINEERS - (SAE) - INVERTED FLARE FEMALE

|  | Dash Size | Nominal Tube Size (ins) | Nominal Thread Size & Pitch | Max Work Pressure (bar) Adaptors |       | Thread ID 'D' on Diagram |      |
|-----------------------------------------------------------------------------------|-----------|-------------------------|-----------------------------|----------------------------------|-------|--------------------------|------|
|                                                                                   |           |                         |                             | Steel                            | Brass | mm                       | in   |
|                                                                                   | 5         | 1/8"                    | 5/16" - 28                  | 320                              | 237   | 6.85                     | 0.27 |
|                                                                                   | 6         | 3/16"                   | 3/8" - 24                   | 340                              | 221   | 8.63                     | 0.34 |
|                                                                                   | 7         | 1/4"                    | 7/16" - 24                  | 270                              | 162   | 10.00                    | 0.39 |
|                                                                                   | 8         | 5/16"                   | 1/2" - 20                   | 225                              | 126   | 11.60                    | 0.46 |
|                                                                                   | 10        | 3/8"                    | 5/8" - 18                   | 225                              | 102   | 14.70                    | 0.58 |
|                                                                                   | 11        | 7/16"                   | 1. 1/16" - 18               | 230                              | 74    | 15.70                    | 0.62 |
|                                                                                   | 12        | 1/2"                    | 3/4" - 18                   | 215                              | 48    | 17.60                    | 0.69 |
|                                                                                   | 14        | 5/8"                    | 7/8" - 18                   | 215                              | -     | 22.10                    | 0.87 |
|                                                                                   | 17        | 3/4"                    | 1. 1/16" - 16               | 215                              | -     | 25.30                    | 1.00 |

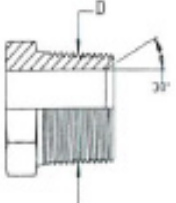
**Applicable Standards**  
Thread Form: SAE J512

## SOCIETY OF AUTOMOTIVE ENGINEERS - (SAE) - INVERTED FLARE MALE

|  |           |                             |  |      |                   |                          |      |
|-------------------------------------------------------------------------------------|-----------|-----------------------------|--------------------------------------------------------------------------------------|------|-------------------|--------------------------|------|
| <b>Applicable Standards</b><br>Thread Form: SAE J512<br><br>Adaptor Version         |           |                             | <b>Applicable Standards</b><br>Thread Form: SAE J512<br><br>Tube version             |      |                   |                          |      |
| Pipe Size                                                                           | Dash Size | Nominal Thread Size & Pitch | Max Work Press (Bar) - SAE J1065 Adaptors                                            |      | Hose Fittings Bar | Thread OD 'D' on Diagram |      |
|                                                                                     |           |                             | Fixed                                                                                | Adj. |                   | mm                       | ins  |
| 5                                                                                   | 1/8"      | 5/16" - 28                  | 320                                                                                  | 237  | -                 | 7.87                     | 0.31 |
| 6                                                                                   | 3/16"     | 3/8" - 24                   | 340                                                                                  | 221  | -                 | 9.65                     | 0.38 |
| 7                                                                                   | 1/4"      | 7/16" - 24                  | 270                                                                                  | 162  | 210               | 11.07                    | 0.44 |
| 8                                                                                   | 5/16"     | 1/2" - 20                   | 225                                                                                  | 126  | 210               | 12.70                    | 0.50 |
| 10                                                                                  | 3/8"      | 5/8" - 18                   | 225                                                                                  | 102  | 210               | 15.85                    | 0.62 |
| 11                                                                                  | 7/16"     | 11/16" - 18                 | 230                                                                                  | 74   | -                 | 17.46                    | 0.69 |
| 12                                                                                  | 1/2"      | 3/4" - 18                   | 215                                                                                  | 48   | 160               | 19.00                    | 0.75 |
| 14                                                                                  | 5/8"      | 7/8" - 18                   | 215                                                                                  | -    | -                 | 22.17                    | 0.87 |

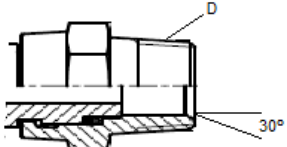
# Thread Identification

## NATIONAL PIPE TAPER FUEL- (NPTF) MALE

|  | Pipe Size | Dash Size | Nominal Thread Size & Pitch | Max Work Press (Bar) Adaptors | Hose Fittings Bar | Thread OD 'D' on Diagram |       |
|-----------------------------------------------------------------------------------|-----------|-----------|-----------------------------|-------------------------------|-------------------|--------------------------|-------|
|                                                                                   |           |           |                             |                               |                   | mm                       | in    |
|                                                                                   | 1/8"      | 2         | 1/8" - 27                   | 689                           | 350               | 10.32                    | 0.406 |
|                                                                                   | 1/4"      | 4         | 1/4" - 18                   | 655                           | 350               | 13.89                    | 0.546 |
|                                                                                   | 3/8"      | 6         | 3/8" - 18                   | 552                           | 275               | 17.06                    | 0.671 |
|                                                                                   | 1/2"      | 8         | 1/2" - 14                   | 414                           | 275               | 21.43                    | 0.843 |
|                                                                                   | 3/4"      | 12        | 3/4" - 14                   | 345                           | 210               | 26.98                    | 1.062 |
|                                                                                   | 1"        | 16        | 1" - 11. 1/2                | 275                           | 210               | 33.33                    | 1.312 |
|                                                                                   | 1 1/4"    | 20        | 1 1/4" - 11. 1/2            | 207                           | 150               | 42.46                    | 1.671 |
|                                                                                   | 1 1/2"    | 24        | 1 1/2" - 11. 1/2            | 138                           | 140               | 48.42                    | 1.906 |
|                                                                                   | 2"        | 32        | 2" - 11. 1/2                | 138                           | 140               | 60.32                    | 2.375 |

**Applicable Standards**  
Thread Form: SAE J476

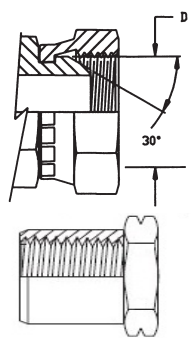
## NATIONAL PIPE TAPER FUEL ( NPTF) MALE SWIVEL

|  | Pipe Size | Dash Size | Nominal Thread Size & Pitch | Max Work Press (Bar) Adaptors | Hose Fittings Bar | Thread OD 'D' on Diagram |       |
|-------------------------------------------------------------------------------------|-----------|-----------|-----------------------------|-------------------------------|-------------------|--------------------------|-------|
|                                                                                     |           |           |                             |                               |                   | mm                       | in    |
|                                                                                     | 1/8"      | 2         | 1/8" - 27                   | -                             | 210               | 10.32                    | 0.406 |
|                                                                                     | 1/4"      | 4         | 1/4" - 18                   | 260                           | 210               | 13.89                    | 0.546 |
|                                                                                     | 3/8"      | 6         | 3/8" - 18                   | 200                           | 210               | 17.06                    | 0.671 |
|                                                                                     | 1/2"      | 8         | 1/2" - 14                   | 170                           | 210               | 21.43                    | 0.843 |
|                                                                                     | 3/4"      | 12        | 3/4" - 14                   | 170                           | 160               | 26.98                    | 1.062 |
|                                                                                     | 1"        | 16        | 1" - 11. 1/2                | -                             | 140               | 33.33                    | 1.312 |

**Applicable Standards**  
Thread Form: SAE J476

## NATIONAL PIPE STRAIGHT MECHANICAL- (NPSM) FEMALE

## NATIONAL PIPE TAPER FUEL - (NPTF) FEMALE FIXED

|  | Pipe Size | Dash Size | Nominal Thread Size & Pitch | Max Work Press (Bar) Adaptors | Hose Fittings Bar | Thread ID 'D' on Diagram |       |
|-------------------------------------------------------------------------------------|-----------|-----------|-----------------------------|-------------------------------|-------------------|--------------------------|-------|
|                                                                                     |           |           |                             |                               |                   | mm                       | in    |
|                                                                                     | 1/8"      | 2         | 1/8" - 27                   | 414                           | 345               | 9.12                     | .359  |
|                                                                                     | 1/4"      | 4         | 1/4" - 18                   | 345                           | 345               | 11.91                    | .468  |
|                                                                                     | 3/8"      | 6         | 3/8" - 18                   | 275                           | 275               | 15.08                    | .593  |
|                                                                                     | 1/2"      | 8         | 1/2" - 14                   | 275                           | 240               | 19.05                    | .750  |
|                                                                                     | 3/4"      | 12        | 3/4" - 14                   | 241                           | 210               | 24.21                    | 0.953 |
|                                                                                     | 1"        | 16        | 1" - 11. 1/2                | 207                           | 170               | 30.56                    | 1.203 |
|                                                                                     | 1 1/4"    | 20        | 1 1/4" - 11. 1/2            | 138                           | -                 | 38.89                    | 1.531 |
|                                                                                     | 1 1/2"    | 24        | 1 1/2" - 11. 1/2            | 103                           | -                 | 45.24                    | 1.781 |
|                                                                                     | 2"        | 32        | 2" - 11. 1/2                | 103                           | -                 | 57.15                    | 2.250 |

**Applicable Standards**  
Thread Form: SAE J476

# Thread Identification

## METRIC MALE 'DKL' LIGHT SERIES

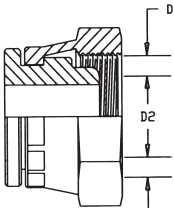
### Applicable Standards

Thread Form: DIN 2353, DIN 3861, DIN 3901, DIN 3902

| Dash Size | Nominal Tube Size 'D2' mm | Correct Torque Nm | Nominal Thread Size & Pitch | Max Work Press (bar)Adaptors * | Hose Fittings Bar | Thread OD 'D1' on Diagram |
|-----------|---------------------------|-------------------|-----------------------------|--------------------------------|-------------------|---------------------------|
| -12       | 6                         | 20                | M12 - 1.5                   | 500                            | 350               | 12                        |
| -14       | 8                         | 35                | M14 - 1.5                   | 500                            | 420               | 14                        |
| -16       | 10                        | 40                | M16 - 1.5                   | 500                            | 420               | 16                        |
| -18       | 12                        | 45                | M18 - 1.5                   | 400                            | 420               | 18                        |
| -22       | 15                        | 55                | M22 - 1.5                   | 400                            | 350               | 22                        |
| -26       | 18                        | 110               | M26 - 1.5                   | 400                            | 350               | 26                        |
| -30       | 22                        | 130               | M30 - 2.0                   | 250                            | 350               | 30                        |
| -36       | 28                        | 200               | M36 - 2.0                   | 250                            | 280               | 36                        |
| -45       | 35                        | 220               | M45 - 2.0                   | 250                            | 210               | 45                        |
| -52       | 42                        | 240               | M52 - 2.0                   | 250                            | 210               | 52                        |

\* Based on Carbon Steel Material

## METRIC FEMALE 'DKL' LIGHT SERIES



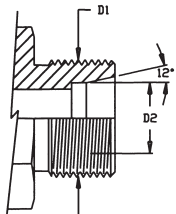
**Applicable Standards**  
Thread Form: DIN 2353 DIN 3861 DIN 3901  
DIN 3902

| Dash Size | Nominal Tube Size 'D2' mm | Correct Torque Nm | Nominal Thread Size & Pitch | Max Work Press (bar) Adaptors* | Hose Fittings Bar | Thread ID 'D1' on Diagram |
|-----------|---------------------------|-------------------|-----------------------------|--------------------------------|-------------------|---------------------------|
| -12       | 6                         | 20                | M12 - 1.5                   | 500                            | 350               | 10.5                      |
| -14       | 8                         | 35                | M14 - 1.5                   | 500                            | 420               | 12.5                      |
| -16       | 10                        | 40                | M16 - 1.5                   | 500                            | 420               | 14.5                      |
| -18       | 12                        | 45                | M18 - 1.5                   | 400                            | 420               | 16.5                      |
| -22       | 15                        | 55                | M22 - 1.5                   | 400                            | 350               | 20.5                      |
| -26       | 18                        | 110               | M26 - 1.5                   | 400                            | 350               | 24.5                      |
| -30       | 22                        | 130               | M30 - 2.0                   | 250                            | 350               | 28.0                      |
| -36       | 28                        | 200               | M36 - 2.0                   | 250                            | 280               | 34.0                      |
| -45       | 35                        | 220               | M45 - 2.0                   | 250                            | 210               | 43.0                      |
| -52       | 42                        | 240               | M52 - 2.0                   | 250                            | 210               | 50.0                      |

\* Based on Carbon Steel Material

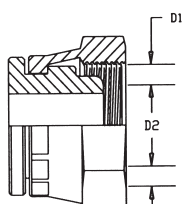
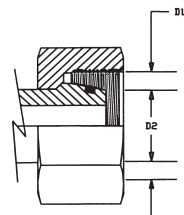
# Thread Identification

## METRIC MALE 'DKS' HEAVY SERIES

|  <p><b>Applicable Standards</b><br/>Thread Form: DIN 2353, DIN 3861, DIN-3901, DIN 3902</p> | Dash Size | Nominal Tube Size 'D2' mm | Correct Torque Nm | Nominal Thread Size & Pitch | Max Work Press (bar)Adaptors * | Hose Fittings Bar | Thread OD 'D1' on Diagram |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------|-------------------|-----------------------------|--------------------------------|-------------------|---------------------------|
|                                                                                                                                                                              | -14       | 6                         | 40                | M14 - 1.5                   | 800                            | 630               | 14                        |
|                                                                                                                                                                              | -16       | 8                         | 45                | M16 - 1.5                   | 800                            | 630               | 16                        |
|                                                                                                                                                                              | -18       | 10                        | 50                | M18 - 1.5                   | 800                            | 630               | 18                        |
|                                                                                                                                                                              | -20       | 12                        | 60                | M20 - 1.5                   | 630                            | 630               | 20                        |
|                                                                                                                                                                              | -22       | 14                        | 80                | M22 - 1.5                   | 630                            | 630               | 22                        |
|                                                                                                                                                                              | -24       | 16                        | 100               | M24 - 1.5                   | 630                            | 450               | 24                        |
|                                                                                                                                                                              | -30       | 20                        | 160               | M30 - 2.0                   | 420                            | 420               | 30                        |
|                                                                                                                                                                              | -36       | 25                        | 240               | M36 - 2.0                   | 420                            | 420               | 36                        |
|                                                                                                                                                                              | -42       | 30                        | 260               | M42 - 2.0                   | 420                            | 420               | 45                        |
|                                                                                                                                                                              | -52       | 38                        | 350               | M52 - 2.0                   | 420                            | 420               | 52                        |

\* Based on Carbon Steel Material

## METRIC FEMALE 'DKS' HEAVY SERIES

|  <p><b>Applicable Standards</b><br/>Thread Form: DIN 2353 DIN 3861 DIN-3901 DIN 3902</p> |                           |                   |  <p><b>Applicable Standards</b><br/>Thread Form: DIN 2353 DIN 3861 DIN-3901 DIN 3902</p> |                                 |                   |                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------|--------------------------------|
| Dash Size                                                                                                                                                                   | Nominal Tube Size 'D2' mm | Correct Torque Nm | Nominal Thread Size & Pitch                                                                                                                                                  | Max Work Press (bar) Adaptors * | Hose Fittings Bar | Thread ID 'D1' on Diagram (mm) |
| -14                                                                                                                                                                         | 6                         | 40                | M14 - 1.5                                                                                                                                                                    | 800                             | 630               | 12.5                           |
| -16                                                                                                                                                                         | 8                         | 45                | M16 - 1.5                                                                                                                                                                    | 800                             | 630               | 14.5                           |
| -18                                                                                                                                                                         | 10                        | 50                | M18 - 1.5                                                                                                                                                                    | 800                             | 630               | 16.5                           |
| -20                                                                                                                                                                         | 12                        | 60                | M20 - 1.5                                                                                                                                                                    | 630                             | 630               | 18.5                           |
| -22                                                                                                                                                                         | 14                        | 80                | M22 - 1.5                                                                                                                                                                    | 630                             | 630               | 20.5                           |
| -24                                                                                                                                                                         | 16                        | 100               | M24 - 1.5                                                                                                                                                                    | 630                             | 450               | 22.5                           |
| -30                                                                                                                                                                         | 20                        | 160               | M30 - 2.0                                                                                                                                                                    | 420                             | 420               | 28.0                           |
| -36                                                                                                                                                                         | 25                        | 240               | M36 - 2.0                                                                                                                                                                    | 420                             | 420               | 34.0                           |
| -42                                                                                                                                                                         | 30                        | 260               | M42 - 2.0                                                                                                                                                                    | 420                             | 420               | 40.0                           |
| -52                                                                                                                                                                         | 38                        | 350               | M52 - 2.0                                                                                                                                                                    | 420                             | 420               | 50.0                           |

\* Based on Carbon Steel Material

# Thread Identification

## JAPANESE INDUSTRIAL STANDARD MALE - BSPP

**Applicable Standards**  
**Thread Form:** JIS B0202

| Dash<br>Size | Nominal   |        | Nominal Thread<br>Size & Pitch | Max Work Press<br>(Bar)<br>Adaptors | Thread OD 'D' on Diagram |       |
|--------------|-----------|--------|--------------------------------|-------------------------------------|--------------------------|-------|
|              | Tube Size | Thread |                                |                                     | mm                       | in    |
|              | ins       | mm     |                                |                                     |                          |       |
| 2            | 1/8"      | 3.2    | 1/8" - 28                      | 350                                 | 9.73                     | 0.383 |
| 4            | 1/4"      | 6.4    | 1/4" - 19                      | 350                                 | 13.16                    | 0.518 |
| 6            | 3/8"      | 10     | 3/8" - 19                      | 350                                 | 16.67                    | 0.656 |
| 8            | 1/2"      | 12     | 1/2" - 14                      | 350                                 | 20.96                    | 0.825 |
| 12           | 3/4"      | 19     | 3/4" - 14                      | 275                                 | 26.45                    | 1.041 |
| 16           | 1"        | 25     | 1" - 11                        | 210                                 | 33.25                    | 1.309 |
| 20           | 1 1/4"    | 32     | 1. 1/4" - 11                   | 170                                 | 41.91                    | 1.65  |
| 24           | 1 1/2"    | 38     | 1. 1/2" - 11                   | 105                                 | 47.81                    | 1.882 |
| 32           | 2"        | 50     | 2" - 11                        | 105                                 | 59.62                    | 2.347 |

**Applicable Standards**  
Thread Form: JIS B00202

## JAPANESE INDUSTRIAL STANDARD FEMALE - BSPP

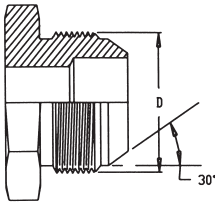
**Applicable Standards**  
**Thread Form:** JIS B0202

| Dash<br>Size | Nominal   |        | Nominal Thread<br>Size & Pitch | Max Work Press<br>(Bar)<br>Adaptors | Hose Fittings Bar | Thread ID 'D' on Diagram |       |
|--------------|-----------|--------|--------------------------------|-------------------------------------|-------------------|--------------------------|-------|
|              | Tube Size | Thread |                                |                                     |                   | mm                       | in    |
|              | ins       | mm     |                                |                                     |                   |                          |       |
| 2            | 1/8"      | 3.2    | 1/8" - 28                      | 350                                 | -                 | 8.59                     | 0.338 |
| 4            | 1/4"      | 6.4    | 1/4" - 19                      | 350                                 | 450               | 11.46                    | 0.451 |
| 6            | 3/8"      | 10     | 3/8" - 19                      | 350                                 | 420               | 14.96                    | 0.589 |
| 8            | 1/2"      | 12     | 1/2" - 14                      | 350                                 | 420               | 18.65                    | 0.734 |
| 12           | 3/4"      | 19     | 3/4" - 14                      | 275                                 | 350               | 24.13                    | 0.95  |
| 16           | 1"        | 25     | 1" - 11                        | 210                                 | 300               | 30.3                     | 1.193 |
| 20           | 1 1/4"    | 32     | 1. 1/4" - 11                   | 170                                 | -                 | 38.97                    | 1.534 |
| 24           | 1 1/2"    | 38     | 1. 1/2" - 11                   | 105                                 | -                 | 44.86                    | 1.766 |
| 32           | 2"        | 50     | 2" - 11                        | 105                                 | -                 | 56.67                    | 2.231 |

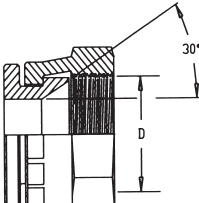
**Applicable Standards**  
Thread Form: JIS B0202

# Thread Identification

## JAPANESE INDUSTRIAL STANDARD MALE - METRIC

|  <p><b>Applicable Standards</b><br/>Thread Form: JIS B8363</p> | Dash Size | Nominal Thread Size & Pitch | Max Work Press (Bar) Adaptors | Hose Fittings Bar | Thread OD 'D' on Diagram |       |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------|-------------------------------|-------------------|--------------------------|-------|
|                                                                                                                                                 |           |                             |                               |                   | mm                       | in    |
|                                                                                                                                                 | 12        | M 12 - 1.5                  |                               | 450               | 12                       | 0.472 |
|                                                                                                                                                 | 14        | M 14 - 1.5                  | 275                           | 420               | 14                       | 0.551 |
|                                                                                                                                                 | 16        | M 16 - 1.5                  |                               | 420               | 16                       | 0.629 |
|                                                                                                                                                 | 18        | M 18 - 1.5                  | 275                           | 420               | 18                       | 0.708 |
|                                                                                                                                                 | 20        | M 20 - 1.5                  |                               | -                 | 20                       | 0.787 |
|                                                                                                                                                 | 22        | M 22 - 1.5                  | 275                           | 420               | 22                       | 0.866 |
|                                                                                                                                                 | 24        | M 24 - 1.5                  | 275                           | 420               | 24                       | 0.944 |
|                                                                                                                                                 | 30        | M 30 - 1.5                  | 275                           | 350               | 30                       | 1.181 |
|                                                                                                                                                 | 33        | M 33 - 1.5                  | 275                           | 300               | 33                       | 1.299 |
|                                                                                                                                                 | 36        | M 36 - 1.5                  |                               | 250               | 36                       | 1.417 |
|                                                                                                                                                 | 42        | M 42 - 1.5                  |                               | 210               | 42                       | 1.653 |

## JAPANESE INDUSTRIAL STANDARD FEMALE - METRIC

|  <p><b>Applicable Standards</b><br/>Thread Form: JIS B8363</p> | Dash Size | Nominal Thread Size & Pitch | Max Work Press (Bar) Adaptors | Hose Fittings Bar | Thread ID 'D' on Diagram |       |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------|-------------------------------|-------------------|--------------------------|-------|
|                                                                                                                                                   |           |                             |                               |                   | mm                       | in    |
|                                                                                                                                                   | 12        | M 12 - 1.5                  |                               | 450               | 10.5                     | 0.413 |
|                                                                                                                                                   | 14        | M 14 - 1.5                  | 275                           | 420               | 12.5                     | 0.492 |
|                                                                                                                                                   | 16        | M 16 - 1.5                  |                               | 420               | 14.5                     | 0.571 |
|                                                                                                                                                   | 18        | M 18 - 1.5                  | 275                           | 420               | 16.5                     | 0.649 |
|                                                                                                                                                   | 20        | M 20 - 1.5                  |                               | -                 | 18.5                     | 0.728 |
|                                                                                                                                                   | 22        | M 22 - 1.5                  | 275                           | 420               | 20.5                     | 0.807 |
|                                                                                                                                                   | 24        | M 24 - 1.5                  | 275                           | 420               | 22.5                     | 0.886 |
|                                                                                                                                                   | 30        | M 30 - 1.5                  | 275                           | 350               | 28.5                     | 1.122 |
|                                                                                                                                                   | 33        | M 33 - 1.5                  | 275                           | 300               | 31.5                     | 1.240 |
|                                                                                                                                                   | 36        | M 36 - 1.5                  |                               | 250               | 34.5                     | 1.358 |
|                                                                                                                                                   | 42        | M 42 - 1.5                  |                               | 210               | 40.5                     | 1.594 |

# Thread Identification

## STAPLELOK

Staplelok has its origins in the German coal mining industry. It is often referred to as 'Stecko', the name given to the product by its inventor, and derived from the German verb 'stecken' meaning 'to pin', along with a truncation of 'O-Ring'.

Staplelok has become the predominant hydraulic hose fitting world wide in underground coal mining.

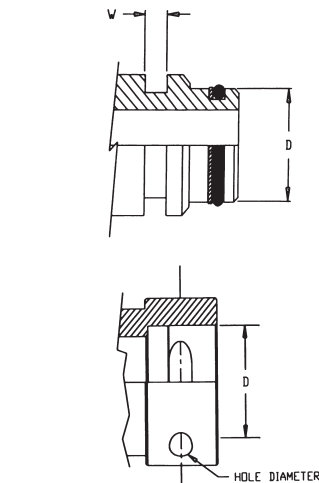
**Sealing and Identification:** The male spigot is equipped with an annular O-Ring with Teflon backup ring that together seal against the cylindrical machined wall of the female coupling. Retention is via a horseshoe shaped square section staple that is inserted through holes in the female socket. The holes align with an annular slot in the male fitting.

**Advantages:** Allows connections to be made in confined spaces and in difficult environments. No torsional load is applied in the fitting, and connection is easy, with no need of spanners. A combination hammer and lever tool is commonly used to facilitate insertion and removal of staples.

**Variations:** Available in the original form, and a more recent 'Super' form to cope with demands for higher working pressures. The 'Super' form employs the same design characteristics, but uses an extra wide staple (sometimes in the form of 2 standard staples laminated together) to increase the shear strength of the staple. No published Standard exists for the 'Super' form.

## STAPLELOK MALE & FEMALE

| Size | Nom. Tube Size |    | 'W' or Hole Dia mm |     | 'D' on Diagram mm |        | Max. Working Pressure (bar)<br>(Based on Use of<br>St. Steel 'D' Staples) |
|------|----------------|----|--------------------|-----|-------------------|--------|---------------------------------------------------------------------------|
|      | in             | mm | Male               | Fem | Male              | Female |                                                                           |
| 6    | 1/4"           | 4  | 5.1                | 6   | 9.9               | 15.1   | 500                                                                       |
| 10   | 3/8"           | 6  | 5.1                | 6   | 13.9              | 20.1   | 420                                                                       |
| 13   | 1/2"           | 8  | 5.1                | 6   | 17.9              | 24.1   | 420                                                                       |
| 20   | 3/4"           | 12 | 5.1                | 6   | 23.9              | 29.1   | 350                                                                       |
| 25   | 1"             | 16 | 7.1                | 8.5 | 30.9              | 39.1   | 280                                                                       |
| 32   | 1.1/4"         | 20 | 7.1                | 8.5 | 37.9              | 46.1   | 210                                                                       |
| 40   | 1.1/2"         | 24 | 7.2                | 9   | 46.9              | 55.2   | 185                                                                       |
| 50   | 2"             | 32 | 7.2                | 9   | 55.9              | 64.2   | 165                                                                       |
| 63   | 2.1/2"         | 40 | 7.2                | 9   | 60.8              | 80.9   | 70                                                                        |
| 76   | 3"             | 48 | 39.4               | 9   | 85.5              | 86.1   | 67                                                                        |



### Applicable Standards

**Thread Form:** DIN 20 043 + SAE J1467

Pirtek Adaptors meet or exceed  
DIN20043, BS6537, and NCB638  
requirements

Stainless Steel staples of all types conform to 420S45 (1.4028) (X30Cr13) in BS EN10088-2:2005.

# Thread Identification

## STAPLELOK SAFETY

- The life expectancy of staples subjected to high pressures and impulses is potentially less than that of the hose and fittings combinations within the same circuit
- Failure of a staple can result in fracture of the staple, or a loss of spring tension leading to dislodgement as a result of system depressurisation followed by re-pressurisation
- **FOR THIS REASON, PIRTEK RECOMMENDS THAT STAPLES SHOULD ALWAYS BE REPLACED BY NEW STAPLES WHEN UNDERTAKING EQUIPMENT MAINTENANCE OR OVERHAULS**



## SUPER STAPLELOK MALE & FEMALE

| Size                                                                        | Nom. Tube Size |    | 'W' or Hole Dia mm |      | 'D' on Diagram mm |        | Max. Working Pressure (bar)<br>(Based on Use of St. Steel 'D' Staples) |
|-----------------------------------------------------------------------------|----------------|----|--------------------|------|-------------------|--------|------------------------------------------------------------------------|
|                                                                             | in             | mm | Male               | Fem  | Male              | Female |                                                                        |
| 13                                                                          | 1/2"           | 8  | 9.1                | 9.1  | 15.9              | 24.3   | 520                                                                    |
| 20                                                                          | 3/4"           | 12 | 9.1                | 9.1  | 21.9              | 29.3   | 420                                                                    |
| 25                                                                          | 1"             | 16 | 13.1               | 13.6 | 30.9              | 39.6   | 420                                                                    |
| 32                                                                          | 1.1/4"         | 20 | 13.1               | 13.6 | 37.9              | 46.6   | 420                                                                    |
| 40                                                                          | 1.1/2"         | 24 | 13.1               | 13.6 | 43.9              | 55.6   | 420                                                                    |
| 50                                                                          | 2"             | 32 | 13.1               | 13.6 | 49.9              | 64.6   | 420                                                                    |
| <div> <p><b>Applicable Standards</b><br/>Not covered by Standard</p> </div> |                |    |                    |      |                   |        |                                                                        |

- Stainless Steel staples of all types material is 420S45 (1.4028) (X30Cr13) in BS EN10088-2:2005.

# Thread Identification

## SKV / SSKV

SSKV and its lower pressure derivative SKV, like Staplelok, have their origins in Germany. Developed specifically for applications requiring secure connections without the need for special tools, and without the drawbacks associated with the older Staplelok technology (bulky profile and easily dislodged or broken staples), it finds many applications both in mining and general industry. The acronym SSKV is derived from the German language meaning 'steckschalenklemmverbindung' or 'plug shell clamp connection'.

**Sealing and Identification:** Sealing resembles Staplelok in that the male spigot is equipped with an annular O-Ring with Teflon backup ring. These seal against the cylindrical machined wall of the female coupling. Retention is however much more sophisticated than Staplelok. A spring loaded shell not unlike a Victaulic clamp is retained by means of a threaded nut that is hand tightened into position to prevent dislodgement of the shell. An (optional) removeable red coloured clip behind the threaded nut in turn prevents unplanned loosening of the nut. Size identification is best done by way of the male collar OD or female body OD (they are designed to be equal). See dimensions D and E below.

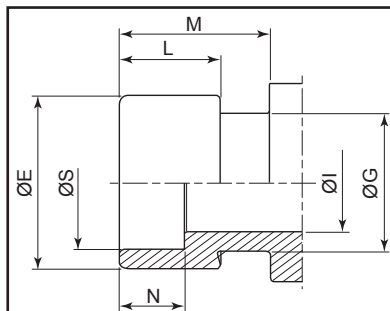
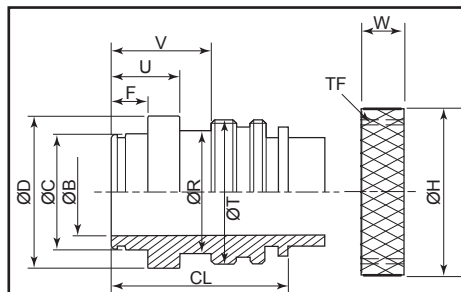
**Advantages:** Allows connections to be made in confined spaces and in difficult environments. No torsional load is applied in the fitting, and connection is easy, with no need of spanners. The slim external profile of the coupling does not protrude beyond the hose outside diameter in most cases, and overall connection length is short. There exist no projecting components to cause snagging or dislodgement.

The 2 forms of the fittings are dimensionally different to preclude accidental intermixing between different pressure circuits.

**Variations:** Available in the both medium and high pressure forms to fill the demands for a wide range of working pressures. The 'SSKV' form has been extensively tested within Australia to SAE J343 for both working pressure and impulse cycles, and has comfortably exceeded 500,000 impulses in all tests (continuing). No Standard exists for either form of the fitting at this point.

Both forms of the fitting are suited to applications where MDG 41 compliance is demanded.

## SKV MALE & FEMALE



| Nom. Tube                           | DN           | 6    | 10   | 13   | 20   | 25   | 32     | 40     | 50   | 63     | 76   | 100  |
|-------------------------------------|--------------|------|------|------|------|------|--------|--------|------|--------|------|------|
|                                     | ins          | 1/4" | 3/8" | 1/2" | 3/4" | 1"   | 1 1/4" | 1 1/2" | 2"   | 2 1/2" | 3"   | 4"   |
|                                     | Dash         | 04   | 06   | 08   | 12   | 16   | 20     | 25     | 32   | 40     | 48   | 64   |
| Pressure (bar)                      | Max. Working | -    | -    | -    | -    | 280  | 210    | 185    | 165  | 70     | 70   | 64   |
|                                     | Min. Burst   | -    | -    | -    | -    | 1120 | 840    | 740    | 660  | 280    | 280  | 256  |
| SKV Female (Hosetails and Adaptors) |              |      |      |      |      |      |        |        |      |        |      |      |
| Dimensions (mm)                     | S            | -    | 14   | 18   | 23   | 27   | 33     | 44     | 56   | 66     | 88   | 105  |
|                                     | E            | -    | 20   | 22   | 28   | 33   | 39.8   | 53     | 65   | 75     | 99   | 118  |
|                                     | G            | -    | 14   | 15.9 | 19.9 | 24.9 | 31.1   | 38.9   | 52.9 | 63.9   | 84.8 | 138  |
|                                     | I            | -    | 7    | 9.8  | 15   | 19   | 24     | 32     | 44   | 55     | 67   | 85   |
|                                     | L            | -    | 16   | 18   | 17   | 17   | 23.6   | 24.5   | 24.5 | 24.5   | 38   | 38   |
|                                     | M            | -    | 24   | 26.5 | 27   | 28.5 | 37     | 37.5   | 38   | 38     | 54.5 | 60   |
|                                     | N            | -    | 11.2 | 13.2 | 13.2 | 13.2 | 18.2   | 15.2   | 15.2 | 15.2   | 25.2 | 26   |
| SKV Male (Hosetails)                |              |      |      |      |      |      |        |        |      |        |      |      |
| Dimensions (mm)                     | B            | -    | 7    | 9.8  | 15   | 19   | 24     | 32     | 44   | 55     | 67   | 86   |
|                                     | C            | -    | 14   | 18   | 23   | 27   | 33     | 44     | 56   | 66     | 88   | 105  |
|                                     | D            | -    | 20   | 22   | 28   | 33   | 39.8   | 53     | 65   | 75     | 99.3 | 138  |
|                                     | R            | -    | 14   | 15.9 | 19.9 | 24.9 | 31.1   | 38.9   | 52.9 | 63.9   | 84.8 | 101  |
|                                     | T            | -    | 19   | 20   | 28   | 37   | 43     | 50     | 64   | 75     | 95   | 122  |
|                                     | F            | -    | 11   | 13   | 13   | 13   | 18     | 15     | 15   | 15     | 25   | 25   |
|                                     | V            | -    | 24   | 26.5 | 27   | 28.3 | 35     | 37.5   | 38   | 38     | 54.5 | 38   |
|                                     | H            | -    | 25   | 28   | 36   | 42   | 50     | 62     | 75   | 85     | 110  | 138  |
|                                     | W            | -    | 14   | 14.5 | 15   | 12.5 | 14     | 19     | 19.5 | 19.5   | 28   | 37.5 |
|                                     | TF           | -    | 19   | 20   | 28   | 37   | 40/43  | 50     | 64   | 75     | 95   | 125  |
| SKV Male (Adaptors)                 |              |      |      |      |      |      |        |        |      |        |      |      |
| Dimensions (mm)                     | B            | -    | 7    | 9.8  | 15   | 19   | 24     | 32     | 44   | 55     | 67   | 86   |
|                                     | C            | -    | 14   | 18   | 23   | 27   | 33     | 44     | 56   | 66     | 88   | 105  |
|                                     | D            | -    | 20   | 22   | 28   | 33   | 39.8   | 53     | 65   | 75     | 99.3 | 118  |
|                                     | R            | -    | 14   | 15.9 | 19.9 | 24.9 | 31.1   | 38.9   | 52.9 | 63.9   | 84.8 | 101  |
|                                     | T            | -    | 24   | 26   | 32   | 37   | 43     | 60     | 70   | 80     | 107  | 122  |
|                                     | F            | -    | 11   | 13   | 13   | 13   | 18     | 15     | 15   | 15     | 25   | 25   |
|                                     | V            | -    | 24   | 26.5 | 27   | 28.3 | 35     | 37.5   | 38   | 38     | 54.5 | 61   |
|                                     | H            | -    | 29   | 33   | 36   | 42   | 50     | 70     | 80   | 90     | 125  | 138  |
|                                     | W            | -    | 15   | 14.5 | 15   | 12.5 | 14     | 22     | 23   | 25.5   | 28   | 37.5 |
|                                     | TF           | -    | 24   | 26   | 32   | 37   | 40/43  | 60     | 70   | 80     | 107  | 125  |

# Thread Identification

## SKV / SSKV ASSEMBLY PROCEDURE

### Step 1:

Ensure you have the appropriate SKV / SSKV components

The SKV / SSKV connections comprise:

- Support Clip



- Shell



- Male End w/- Retaining Nut



- Female End



### SSKV MALE & FEMALE

### Step 2:

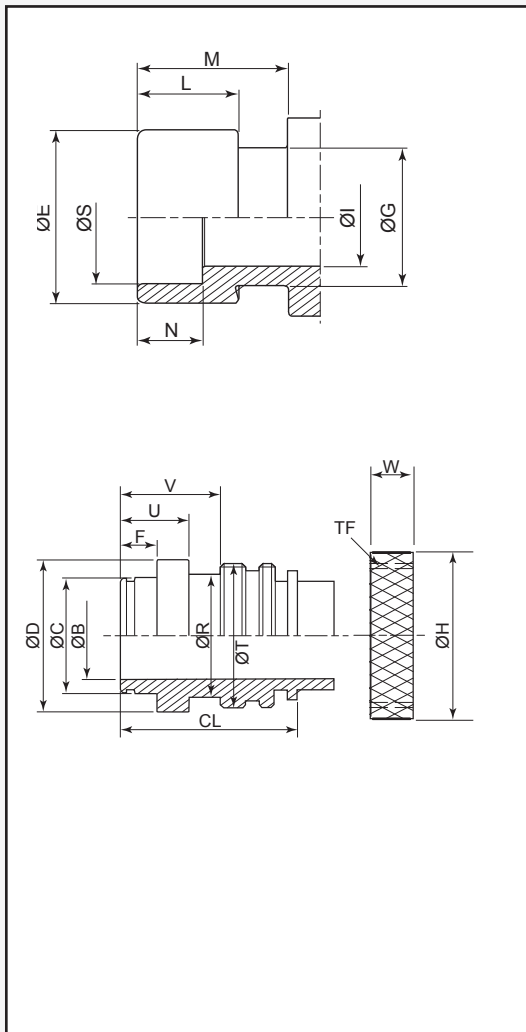
Lubricate the O-Ring and internal body of the female fitting using Pirtek Protect Lanoline Grease. Insert the male spigot into the female until the shoulders touch as can be seen in the photograph at right.

### Step 3:

Fit the spring supported Shell over the mating male and female connection and ensure that it is a snug fit into the grooves, equally ensuring that the two halves of the shell meet and align. Ensure that the split in the Shell is level, parallel and forms a complete closed diameter to ensure that it is properly engaged in the grooves as evident at right.

### Step 4:

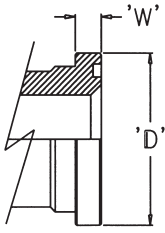
Lubricate the thread of the retaining nut with Pirtek Protect Lanoline Grease. Turn the retaining nut toward the shell by hand until it meets firmly against the shoulder of the shell. A "C" Spanner may be used, but is not essential. Clip the optional plastic safety clip into position firmly at the rear of the retaining nut ensuring that it is not loose, although some sideways movement is permitted in the housing groove.



| Nom. Tube                            | DN           | 6    | 10   | 13   | 20   | 25   | 32     | 40     | 50   | 63     |
|--------------------------------------|--------------|------|------|------|------|------|--------|--------|------|--------|
|                                      | ins          | 1/4" | 3/8" | 1/2" | 3/4" | 1"   | 1 1/4" | 1 1/2" | 2"   | 2 1/2" |
|                                      | Dash         | 04   | 06   | 08   | 12   | 16   | 20     | 25     | 32   | 40     |
| Pressure (bar)                       | Max. Working | -    | 420  | 420  | 420  | 420  | 420    | 420    | 420  | 350    |
|                                      | Min. Burst   | -    | 1680 | 1680 | 1680 | 1680 | 1680   | 1680   | 1400 | 1400   |
| SSKV Female (Hosetails and Adaptors) |              |      |      |      |      |      |        |        |      |        |
| Dimensions (mm)                      | S            | -    | 14   | 18   | 23   | 28   | 33     | 42     | 54   | 65     |
|                                      | E            | -    | 20   | 24   | 30   | 36   | 44     | 54     | 70   | 84     |
|                                      | G            | -    | 14   | 18   | 23   | 28   | 33     | 39     | 56   | 69     |
|                                      | I            | -    | 7    | 10   | 15   | 20   | 24     | 30     | 40   | 50     |
|                                      | L            | -    | 16   | 18   | 18   | 21   | 26     | 29.5   | 31   | 41     |
|                                      | M            | -    | 24   | 26.5 | 27   | 33   | 39     | 43.5   | 46   | 62.5   |
|                                      | N            | -    | 11   | 13   | 13   | 15   | 18     | 20     | 20   | 25     |
|                                      |              | -    |      |      |      |      |        |        |      |        |
| SSKV Male (Hosetails)                |              |      |      |      |      |      |        |        |      |        |
| Dimensions (mm)                      | B            | -    | 7    | 10   | 15   | 20   | 24     | 30     | 40   | 50     |
|                                      | C            | -    | 14   | 18   | 23   | 28   | 33     | 42     | 54   | 65     |
|                                      | D            | -    | 20   | 24   | 30   | 36   | 44     | 54     | 70   | 84     |
|                                      | R            | -    | 14   | 18   | 23   | 28   | 33     | 39     | 56   | 69     |
|                                      | T            | -    | 19   | 23   | 32   | 38   | 43     | 50/55  | 66   | 86     |
|                                      | F            | -    | 11   | 13   | 13   | 15   | 18     | 20     | 20   | 25     |
|                                      | V            | -    | 25   | 26.5 | 27   | 32   | 39     | 43     | 46   | 62.5   |
|                                      | H            | -    | 25   | 30   | 38   | 45   | 52     | 64     | 78   | 98     |
|                                      | W            | -    | 14   | 13.5 | 15   | 13.5 | 13.5   | 19     | 19.5 | 25     |
|                                      | TF           | -    | 20   | 23   | 32   | 38   | 43     | 50/55  | 66   | 86     |
|                                      |              | -    |      |      |      |      |        |        |      |        |
|                                      |              | -    |      |      |      |      |        |        |      |        |
|                                      |              | -    |      |      |      |      |        |        |      |        |
| SSKV Male (Adaptors)                 |              |      |      |      |      |      |        |        |      |        |
| Dimensions (mm)                      | B            | -    | 7    | 10   | 15   | 20   | 24     | 30     | 40   | 50     |
|                                      | C            | -    | 14   | 18   | 23   | 28   | 33     | 42     | 54   | 65     |
|                                      | D            | -    | 20   | 24   | 30   | 36   | 44     | 54     | 70   | 84     |
|                                      | R            | -    | 14   | 18   | 23   | 28   | 33     | 39     | 56   | 69     |
|                                      | T            | -    | 24   | 28   | 34   | 41   | 50     | 60     | 76   | 95     |
|                                      | F            | -    | 11   | 13   | 13   | 15   | 18     | 20     | 20   | 25     |
|                                      | V            | -    | 24   | 26.5 | 27   | 32   | 39     | 43     | 46   | 62.5   |
|                                      | H            | -    | 29   | 34   | 40   | 47   | 64     | 72     | 85   | 110    |
|                                      | W            | -    | 15   | 13   | 15   | 14.5 | 19     | 22     | 23   | 28     |
|                                      | TF           | -    | 21.5 | 28   | 34   | 41   | 50     | 60     | 70   | 90     |
|                                      |              | -    |      |      |      |      |        |        |      |        |
|                                      |              | -    |      |      |      |      |        |        |      |        |
|                                      |              | -    |      |      |      |      |        |        |      |        |

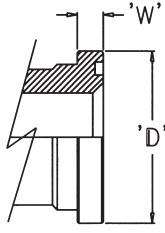
# Thread Identification

## SAE J518 CODE 61 FLANGE

|  <p><b>Applicable Standards</b><br/>Thread Form: SAE J518-1<br/>ISO6162-1</p> | Dash Size | Nominal Tube Size |      | 'W' on Diagram |      | Max Work Press. Adaptors | Hose Fittings | Flange OD 'D' on Diagram |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------|------|----------------|------|--------------------------|---------------|--------------------------|--------|
|                                                                                                                                                                |           | ins               | mm   | ins            | mm   | bar                      | Bar           | ins                      | mm     |
|                                                                                                                                                                | 8         | 1/2"              | 12.7 | 0.265          | 6.73 | 350                      | 350           | 1.188                    | 30.18  |
|                                                                                                                                                                | 10 †      | 5/8"              | 16   | 0.265          | 6.73 | 350                      | 350           | 1.340                    | 34     |
|                                                                                                                                                                | 12        | 3/4"              | 19   | 0.265          | 6.73 | 350                      | 350           | 1.500                    | 38.1   |
|                                                                                                                                                                | 16        | 1"                | 25.4 | 0.315          | 8    | 320                      | 350           | 1.750                    | 44.45  |
|                                                                                                                                                                | 20        | 1.1/4"            | 32   | 0.315          | 8    | 280                      | 280           | 2.000                    | 50.8   |
|                                                                                                                                                                | 24        | 1.1/2"            | 38   | 0.315          | 8    | 210                      | 210           | 2.375                    | 60.33  |
|                                                                                                                                                                | 32        | 2"                | 51   | 0.375          | 9.53 | 210                      | 210           | 2.812                    | 71.42  |
|                                                                                                                                                                | 40        | 2.1/2"            | 63.5 | 0.375          | 9.53 | 175                      | 175           | 3.312                    | 84.12  |
|                                                                                                                                                                | 48        | 3"                | 76   | 0.375          | 9.53 | 160                      | 160           | 3.999                    | 101.60 |
|                                                                                                                                                                | 56        | 3.1/2"            | 89   | 0.444          | 11.3 | 35                       | 35            | 4.499                    | 114.30 |
|                                                                                                                                                                | 64        | 4"                | 102  | 0.444          | 11.3 | 35                       | 35            | 4.999                    | 127.00 |

† Komatsu produce flanges to the Japanese **JIS** Standard. They comply with Code 61 and Code 62 in all respects except O-Ring groove dimensions. Refer to Pirtek fittings catalogue Section C for details. Never use Imperial O-Rings (**Y** or **OKS**) in Komatsu® flanges - only **KY** series. Dash Size 10 is unique to the **JIS** Standard.

## SAE J518 CODE 62 FLANGE

|  <p><b>Applicable Standards</b><br/>Thread Form: SAE J518-2<br/>ISO6162-2</p> | Dash Size | Nominal Tube Size |      | 'W' on Diagram |       | Max Work Press. Adaptors & Hose tails | Flange OD 'D' on Diagram |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------|------|----------------|-------|---------------------------------------|--------------------------|--------|
|                                                                                                                                                                 |           | ins               | mm   | ins            | mm    | bar                                   | ins                      | mm     |
|                                                                                                                                                                 | 8         | 1/2"              | 12.7 | 0.305          | 7.75  | 420                                   | 1.250                    | 31.750 |
|                                                                                                                                                                 | 12        | 3/4"              | 19   | 0.345          | 8.76  | 420                                   | 1.625                    | 41.280 |
|                                                                                                                                                                 | 16        | 1"                | 25.4 | 0.375          | 9.53  | 420                                   | 1.875                    | 47.630 |
|                                                                                                                                                                 | 20        | 1.1/4"            | 32   | 0.405          | 10.29 | 420                                   | 2.125                    | 53.980 |
|                                                                                                                                                                 | 24        | 1.1/2"            | 38   | 0.495          | 12.57 | 420                                   | 2.500                    | 63.500 |
|                                                                                                                                                                 | 32        | 2"                | 51   | 0.495          | 12.57 | 420                                   | 3.125                    | 79.380 |

NOTE: Komatsu use flanges that comply with Code 61 and Code 62 in all respects except O-Ring groove dimensions. Refer to Pirtek fittings catalogue Section C for details. They comply to a JIS Standard, and include a Dash 10 size.

## 'SUPERCAT' FLANGE

NOTE: This term applies to flanges with a flange head thickness of 14.2 mm, but conform in all other respects to the dimensions of SAE Code 62 flanges. They are to be found on new generation Caterpillar® equipment. Code 62 Flange clamps do not suit 'Supercat' Flange

Pirtek have available a range of fittings that conform to the dimensions of the new fittings. Please refer to Fittings Catalogue Section C for detail.

Product Codes follow Code 62 guidelines, but have a suffix 'C' to differentiate them eg C621C

No SAE Standard has been published as yet for the flanges

| Flange Size | Associated Bolt Details for Flange Clamps |          |        |                             |                         |        |                              |                        |                             |        |                             |                         |                             |    |                             |
|-------------|-------------------------------------------|----------|--------|-----------------------------|-------------------------|--------|------------------------------|------------------------|-----------------------------|--------|-----------------------------|-------------------------|-----------------------------|----|-----------------------------|
|             | SAE Code 61                               |          |        |                             |                         |        |                              | SAE Code 62 & Supercat |                             |        |                             |                         |                             |    |                             |
|             | UNC Bolts Grade 8                         |          |        |                             | Metric Bolts Class 10.9 |        |                              | UNC Bolts Grade 8      |                             |        |                             | Metric Bolts Class 10.9 |                             |    |                             |
| Dash        | Size                                      | Thread   | Length | Bolt Torque †<br>Nm +10%-0" | Thread                  | Length | "Bolt Torque †<br>Nm +10%-0" | Thread                 | Length<br>Code 62 Supercat" |        | Bolt Torque †<br>Nm +10%-0" | Thread                  | Length<br>Code 62 Supercat" |    | Bolt Torque †<br>Nm +10%-0" |
| 08          | 1/2"                                      | 5/16"-18 | 1.1/4" | 32                          | M8x1.25                 | 25     | 32                           | 5/16"-18               | 1.1/4"                      | -      | 32                          | M8x1.25                 | 30                          | -  | 32                          |
| 10          | 5/8"                                      | 5/16"-18 | 1.1/4" | 32                          | M8x1.25                 | 35     | 32                           | -                      | -                           | -      | -                           | -                       | -                           | -  | -                           |
| 12          | 3/4"                                      | 3/8"-16  | 1.1/4" | 60                          | M10x1.5                 | 30     | 70                           | 3/8"-16                | 1.1/2"                      | 1.3/4" | 60                          | M10x1.5                 | 35                          | 45 | 70                          |
| 16          | 1"                                        | 3/8"-16  | 1.1/4" | 60                          | M10x1.5                 | 30     | 70                           | 7/16"-14               | 1.3/4"                      | 1.3/4" | 92                          | M12x1.75                | 45                          | 45 | 130                         |
| 20          | 1.1/4"                                    | 7/16"-14 | 1.1/2" | 92                          | M10x1.5                 | 30     | 70                           | 1/2"-13                | 1.3/4"                      | 2"     | 150                         | M12x1.75"               | 45                          | 50 | 130                         |
| 24          | 1.1/2"                                    | 1/2"-13  | 1.1/2" | 150                         | M12x1.75                | 35     | 130                          | 5/8"-11                | 2.1/4"                      | 2.1/2" | 295                         | M16x2                   | 55                          | 60 | 295                         |
| 32          | 2"                                        | 1/2"-13  | 1.1/2" | 150                         | M12x1.75                | 35     | 130                          | 3/4"-10                | 2.3/4"                      | -      | 450                         | M20x2.5                 | 70                          | -  | 550                         |
| 40          | 2.1/2"                                    | 1/2"-13  | 1.3/4" | 150                         | M12x1.75                | 40     | 130                          | -                      | -                           | -      | -                           | -                       | -                           | -  | -                           |
| 48          | 3"                                        | 5/8"-11  | 1.3/4" | 295                         | M16x2                   | 50     | 295                          | -                      | -                           | -      | -                           | -                       | -                           | -  | -                           |
| 56          | 3.1/2"                                    | 5/8"-11  | 2"     | 295                         | M16x2                   | 50     | 295                          | -                      | -                           | -      | -                           | -                       | -                           | -  | -                           |
| 64          | 4"                                        | 5/8"-11  | 2"     | 295                         | M16x2                   | 50     | 295                          | -                      | -                           | -      | -                           | -                       | -                           | -  | -                           |

† Torque values based on SAE J518 standard and are only a guide when using lubricated bolts.

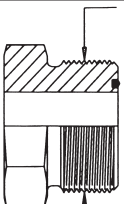
\*NOTE: designs pre 2012 thread can be M14x2.

This page is part of a complete catalogue containing technical and safety data.  
All data must be reviewed when selecting a product.  
Pirtek reserve the right to change technical specifications without notice

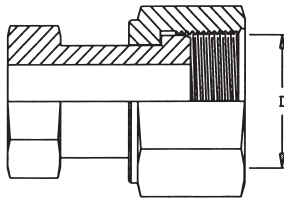


# Thread Identification

## 'O' RING FACE SEAL MALE

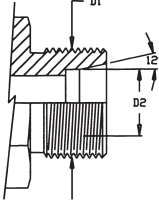
|  <p><b>Applicable Standards</b><br/>Thread Form: SAE J1453</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Dash Size | Nominal Tube Size (ins) | Nominal Thread Size & Pitch | Correct Torque (Nm) | Max Work Press. (bar) Adaptors | Hose Fittings | Thread OD 'D' on Diagram |       |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------|-----------------------------|---------------------|--------------------------------|---------------|--------------------------|-------|----|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |                         |                             |                     |                                |               | Bar                      | ins   | mm |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 4         | 1/4"                    | 9/16 - 18                   | 15                  | 630                            | 450           | 0.56                     | 14.22 |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6         | 3/8"                    | 11/16- 16                   | 25                  | 630                            | 450           | 0.69                     | 17.52 |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8         | 1/2"                    | 13/16 - 16                  | 45                  | 630                            | 420           | 0.82                     | 20.82 |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10        | 5/8"                    | 1-14                        | 65                  | 413                            | 420           | 1.00                     | 25.40 |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 12        | 3/4"                    | 1. 3/16 - 12                | 95                  | 413                            | 420           | 1.19                     | 30.22 |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 16        | 1"                      | 1. 7/16 - 12                | 130                 | 413                            | 420           | 1.44                     | 36.57 |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 20        | 1 1/4"                  | 1. 11/16 - 12               | 190                 | 275                            | 350           | 1.69                     | 42.92 |    |
| 24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1 1/2"    | 2 - 12                  | 220                         | 275                 | 300                            | 2.00          | 50.80                    |       |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |                         |                             |                     | Max. Press. (Mpa)              |               |                          |       |    |
| <p><b>Applicable Standards</b><br/>Thread Form: Metric<br/><b>Standard:</b> Unknown Chinese Standard<br/>A metric threaded design similar to ORFS is increasingly being encountered on equipment of Chinese origin. The pressure rating is linked to the designed working pressure of the hose that it accompanies (Sizes and pressures marked with * refer to spiral hoses. All others relate to a 3-braid design and should be considered the maximum achievable).</p> <p>The O-Ring sits in a recessed flat area of the face rather than in a groove as found in the SAE J1453 version of ORFS.</p> | 14        | ¼"                      | M14 x 1.5                   |                     | 65                             |               | -                        | 14    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 16        | 5/16"                   | M16 x 1.5                   |                     | 53                             |               | -                        | 16    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 18        | ⅜"                      | M18 x 1.5                   |                     | 53                             |               | -                        | 18    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 20*       | ¼"*                     | M20 x 1.5                   |                     | 100*                           |               | -                        | 20    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 22        | ½"                      | M22 x 1.5                   |                     | 38                             |               | -                        | 22    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 24*       | ⅜"                      | M24 x 1.5                   |                     | 70                             |               | -                        | 24    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 27*       | 5/8", ½"*               | M27 x 1.5                   |                     | 34, 60*                        |               | -                        | 27    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 30        | ¾"                      | M30 x 1.5                   |                     | 30                             |               | -                        | 30    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 33*       | 5/8"*                   | M33 x 2                     |                     | 55*                            |               | -                        | 33    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 36*       | ¾"*                     | M36 x 2                     |                     | 46*                            |               | -                        | 36    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 39        | 1"                      | M39 x 2                     |                     | 21                             |               | -                        | 39    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 45*       | 1¼", 1"*                | M45 x 2                     |                     | 12, 35*                        |               | -                        | 45    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 52*       | 1½", 1¼"                | M52 x 2                     |                     | 11, 32*                        |               | -                        | 52    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 64*       | 2"*                     | M64 x 2                     |                     | 9, 25*                         |               | -                        | 64    |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 70*       | 2"*                     | M70 x 2                     |                     | 20*                            |               | -                        | 70    |    |

## 'O' RING FACE SEAL FEMALE

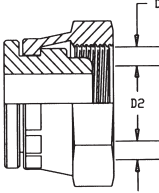
|  <p><b>Applicable Standards</b><br/>Thread Form: SAE J1453<br/><b>Materials Available:</b> S12L14<br/>(Mild Steel) GB12361-12362 Part II (Drop Forged)</p> | Dash Size | Nominal Tube Size (ins) | Nominal Thread Size & Pitch | Correct Torque (Nm) | Max Work Press.(bar) SAE J1453 Adaptors | Hose Fittings | Thread iD 'D' on Diagram |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------|-----------------------------|---------------------|-----------------------------------------|---------------|--------------------------|-------|
|                                                                                                                                                                                                                                               |           |                         |                             |                     |                                         | Bar           | ins                      | mm    |
|                                                                                                                                                                                                                                               | 4         | 1/4"                    | 9/16 - 18                   | 15                  | 420                                     | 450           | 0.51                     | 12.95 |
|                                                                                                                                                                                                                                               | 6         | 3/8"                    | 11/16 - 16                  | 25                  | 420                                     | 450           | 0.63                     | 16    |
|                                                                                                                                                                                                                                               | 8         | 1/2"                    | 13/16 - 16                  | 45                  | 420                                     | 420           | 0.75                     | 19.05 |
|                                                                                                                                                                                                                                               | 10        | 5/8"                    | 1 - 14                      | 65                  | 420                                     | 420           | 0.93                     | 23.62 |
|                                                                                                                                                                                                                                               | 12        | 3/4"                    | 1. 3/16 - 12                | 95                  | 420                                     | 420           | 1.11                     | 28.19 |
|                                                                                                                                                                                                                                               | 16        | 1"                      | 1. 7/16 - 12                | 130                 | 420                                     | 420           | 1.36                     | 34.54 |
|                                                                                                                                                                                                                                               | 20        | 1. 1/4"                 | 1. 11/16 - 12               | 190                 | 280                                     | 350           | 1.61                     | 40.89 |
| 24                                                                                                                                                                                                                                            | 1. 1/2"   | 2 - 12                  | 220                         | 280                 | 300                                     | 1.92          | 48.76                    |       |
| See also Chinese Metric Form documented above                                                                                                                                                                                                 |           |                         |                             |                     |                                         |               |                          |       |

# Thread Identification

## GAZ FRENCH METRIC MALE

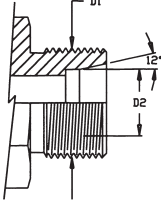
|  | Dash Size | Nominal Tube Size 'D2" mm | Nominal Thread Size & Pitch) | Thread OD 'D' on Diagram |       |
|-----------------------------------------------------------------------------------|-----------|---------------------------|------------------------------|--------------------------|-------|
|                                                                                   |           |                           |                              | mm                       | in    |
|                                                                                   | 20        | 13.25                     | M20 - 1.5                    | 20.0                     | 0.787 |
|                                                                                   | 24        | 16.75                     | M24 - 1.5                    | 24.0                     | 0.944 |
|                                                                                   | 30        | 21.25                     | M30 - 1.5                    | 30.0                     | 1.181 |
|                                                                                   | 36        | 26.75                     | M36 - 1.5                    | 36.0                     | 1.417 |
|                                                                                   | 45        | 33.50                     | M45 - 1.5                    | 45.0                     | 1.771 |
|                                                                                   | 52        | 42.25                     | M52 - 1.5                    | 52.0                     | 2.047 |
|                                                                                   | 58        | 48.25                     | M58 - 2.0                    | 58.0                     | 2.283 |

## GAZ FRENCH METRIC FEMALE

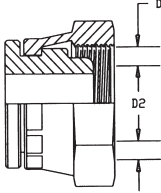
|  | Dash Size | Nominal Tube Size 'D2" mm | Nominal Thread Size & Pitch) | Thread ID 'D' on Diagram |       |
|------------------------------------------------------------------------------------|-----------|---------------------------|------------------------------|--------------------------|-------|
|                                                                                    |           |                           |                              | mm                       | in    |
|                                                                                    | 20        | 13.25                     | M20 - 1.5                    | 18.5                     | 0.728 |
|                                                                                    | 24        | 16.75                     | M24 - 1.5                    | 22.5                     | 0.885 |
|                                                                                    | 30        | 21.25                     | M30 - 1.5                    | 28.5                     | 1.122 |
|                                                                                    | 36        | 26.75                     | M36 - 1.5                    | 34.5                     | 1.358 |
|                                                                                    | 45        | 33.50                     | M45 - 1.5                    | 43.5                     | 1.712 |
|                                                                                    | 52        | 42.25                     | M52 - 1.5                    | 50.5                     | 1.988 |
|                                                                                    | 58        | 48.25                     | M58 - 2.0                    | 55.0                     | 2.165 |

# Thread Identification

## KOBELCO METRIC MALE

|  | Dash Size | Nominal Tube Size 'D2" mm | Nominal Thread Size & Pitch | Thread OD 'D' on Diagram |       |
|-----------------------------------------------------------------------------------|-----------|---------------------------|-----------------------------|--------------------------|-------|
|                                                                                   |           |                           |                             | mm                       | in    |
|                                                                                   | 30        | 22.30                     | M30 - 1.5                   | 30.0                     | 1.181 |
|                                                                                   | 36        | 28.20                     | M36 - 1.5                   | 36.0                     | 1.417 |
|                                                                                   | 45        | 35.20                     | M45 - 1.5                   | 45.0                     | 1.771 |
|                                                                                   |           |                           |                             |                          |       |
|                                                                                   |           |                           |                             |                          |       |
|                                                                                   |           |                           |                             |                          |       |
|                                                                                   |           |                           |                             |                          |       |

## KOBELCO METRIC FEMALE

|  | Dash Size | Nominal Tube Size 'D2" mm | Nominal Thread Size & Pitch | Thread ID 'D' on Diagram |       |
|------------------------------------------------------------------------------------|-----------|---------------------------|-----------------------------|--------------------------|-------|
|                                                                                    |           |                           |                             | mm                       | in    |
|                                                                                    | 30        | 22.3                      | M30 - 1.5                   | 28.5                     | 1.122 |
|                                                                                    | 36        | 28.2                      | M36 - 1.5                   | 34.5                     | 1.358 |
|                                                                                    | 45        | 35.2                      | M45 - 1.5                   | 43.5                     | 1.712 |
|                                                                                    |           |                           |                             |                          |       |
|                                                                                    |           |                           |                             |                          |       |
|                                                                                    |           |                           |                             |                          |       |
|                                                                                    |           |                           |                             |                          |       |

# COMMON INDUSTRY STANDARDS AND APPROVALS

| Engineering Standard                          | Sub Standard | Typical Construction                                       | Major Area of Application                                                                                                                     |
|-----------------------------------------------|--------------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| SAE J517<br>comprising these<br>Sub-Standards | R1A, R1AT    | 1 wire braid                                               | General hydraulics medium pressure                                                                                                            |
|                                               | R2A, R2AT    | 2 wire braid                                               | General hydraulics high pressure                                                                                                              |
|                                               | R3           | 2 textile braid                                            | General hydraulics low pressure                                                                                                               |
|                                               | R4           | Textile and wire helix                                     | General hydraulics suction / return                                                                                                           |
|                                               | R5, J1402    | Textile & 1 wire braid with woven cotton cover (or rubber) | Trucking industry air and oil hose (air brakes & transmission coolers)                                                                        |
|                                               | R6           | 1 textile braid                                            | General hydraulics low pressure                                                                                                               |
|                                               | R7           | Thermoplastic hose with synthetic reinforcement            | General hydraulics medium pressure. R1AT performance equivalent. Niche market applications                                                    |
|                                               | R8           | Thermoplastic hose with synthetic reinforcement            | General hydraulics high pressure. R2AT performance equivalent. Niche market applications                                                      |
|                                               | R9, R10, R9R | Multispiral                                                | High pressure/impulse general hydraulics. R9 and R10 comparatively rare (superseded)                                                          |
|                                               | R11          | High pressure multispiral                                  | Ranges from 420 bar in -12 down to 210 bar in -32 size                                                                                        |
|                                               | R12          | Grey covered multispiral                                   | Commonly referred to as Cat® XT-3. General hydraulics with high pressures (200 + bar) / impulse. New generation hose is black                 |
|                                               | R13          | Rust red coloured multispiral                              | Commonly referred to as Cat® XT-5. General hydraulics with very high pressures (350 bar) / impulse. New generation hose is black              |
|                                               | R14          | Stainless steel braid over Teflon liner                    | Specialist hose in high temperature and food / chemical applications. Common in engine turbo oil lines and steam or hot compressed air lines. |
|                                               | R15          | 4 or 6 wire multispiral                                    | General hydraulics extreme (420 bar) pressures and impulse                                                                                    |
|                                               | R16          | New generation compact 2 wire braid                        | General hydraulics for high pressure where space and flexibility are important                                                                |
|                                               | R17          | 1 or 2 wire braid                                          | Constant work pressure (3000 psi or 206 bar) in all sizes                                                                                     |
|                                               | R18          | Thermoplastic hose with synthetic reinforcement            | Constant work pressure (3045 psi or 210 bar) in all sizes                                                                                     |
|                                               | R19          | 1 or 2 wire braid                                          | Constant work pressure (4000 psi or 275 bar) in all sizes                                                                                     |
| SAE                                           | J1402 / R5   | Textile & 1 wire braid with woven cotton cover (or rubber) | Trucking industry air and oil hose (air brakes & transmission coolers). Diesel fuel hose                                                      |
|                                               | J1527        | Textile & wire braid hose with fire resistant cover        | Marine fuel and engine hose                                                                                                                   |
|                                               | J2064        | Textile braid                                              | Air conditioning hose                                                                                                                         |
| ISO                                           | 3862 1SN     | 1 wire braid                                               | Approximates SAE R1AT                                                                                                                         |
|                                               | 3862 2SN     | 2 wire braid                                               | Approximates SAE R2AT                                                                                                                         |
| DIN                                           | 20022 1SN    | 1 wire braid                                               | Approximates SAE R1AT                                                                                                                         |
|                                               | 20022 2SN    | 2 wire braid                                               | Approximates SAE R2AT                                                                                                                         |
|                                               | 20023 4SP    | 4 wire spiral                                              | Approximates SAE R12                                                                                                                          |
|                                               | 20023 4SH    | 4 wire spiral                                              | Approximates SAE R13                                                                                                                          |
| EN                                            | 853 1SN      | 1 wire braid                                               | Approximates SAE R1AT                                                                                                                         |
|                                               | 853 2SN      | 2 wire braid                                               | Approximates SAE R2AT                                                                                                                         |
|                                               | 856 4SP      | 4 wire spiral                                              | Approximates SAE R12                                                                                                                          |
|                                               | 856 4SH      | 4 wire spiral                                              | Approximates SAE R13                                                                                                                          |
|                                               | 857 1SC      | 1 wire braid                                               | Approximates SAE R1AT but compact dimensions                                                                                                  |
|                                               | 857 2SC      | 2 wire braid                                               | Approximates SAE R2AT but compact dimensions                                                                                                  |

| Approvals          | Certifying Authority                    | Area of Operation                          |
|--------------------|-----------------------------------------|--------------------------------------------|
| MSHA               | Mine Safety & Health Administration USA | Mining safety                              |
| NCB                | National Coal Board UK                  | Coal Mining                                |
| LOBA               | Landesoberbergamt Germany               | Mining                                     |
| AS1180             | Australian Standard 1180                | Mining (especially FRAS Standards)         |
| ISO                | International Standards Organisation    | General, but includes specifics for mining |
| DIN                | Deutsches Institut für Normung e.V.     | General, but includes specifics for mining |
| DOT                | Department of Transport                 | Transportation                             |
| Lloyds Register    | Lloyds of London                        | Shipping Insurance                         |
| Germansicher Lloyd | Lloyds Germany                          | Shipping Insurance                         |
| ABS                | American Bureau of Shipping             | Shipping                                   |
| DNV                | Det Norske Veritas                      | Shipping                                   |
| USCG               | United States Coast Guard               | Shipping                                   |

SAE = Society of Automotive Engineers

ISO = International Standards Organisation

EN = European Nations

Deutsches Institut für Normung e.V. (the basis for the European Nations Standards)

AS = Australian Standard

BS = British Standard

Other specifications may be encountered based on naval, air force, and military requirements, as well as more obscure commercial shipping classifications for nations such as Italy, Russia, Poland etc.

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All data must be reviewed when selecting a product.

Pirtek reserve the right to change technical specifications without notice

