PRODUCT INQUIRY

Please send this completed form to: customerservice@pirtekusa.com OR Fax to (321) 504-6009

Center	
Contact Person	
Date	

Please attach any photos or dimensional sketches of the products requested with this form, this helps with clairifying request.

Pictures Sent	Yes	No	Date Sent
	○	○	

SIZE	**Industry Dash Size**

TEMPERATURE		
Temperature of Medium	°F	°C
Environmental Temp	°F	°C

Comments on Temperature

Please add comments on temperature here.

APPLICATION	**Consider (but not limited to) whether the component is indoor or outdoor, bend radius, movement, types of conditions, type of machine or equipment, what the product is intended for, etc.**

Be as descriptive as possible to convey what the hose / item will be subjected to below.

MEDIUM CONVEYED	

If the medium is more complex and no MSDS is attached, please provide as much information as possible.

Comments on Medium

Please add specific details pertaining to medium here.

PRESSURE			**RECOMMENDED FLOW**
Operating Pressure	PSI	BAR	GPM
Peak Pressure	PSI	BAR	

VACUUM / SUCTION	
Mercury (in/hg)	

Comments on Pressure, Suction or Flow

Please add specific details pertaining to pressure, suction or flow here.

PRODUCT INQUIRY

Please send this completed form to: customerservice@pirtekusa.com OR Fax to (321) 504-6009

ENDS		
Industry Dash Size		
Thread Type		
Fitting/Adapter Angle (°)		
Suggested Part No. / Vendor		
Material		

Comments on Ends

Please add specific details pertaining to ends here.

DELIVERY		
Date product is required		

Comments on Delivery

Please add specific details pertaining to delivery here.

ADDITIONAL INFORMATION REGARDING INQUIRY

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 4.5 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 1 inch from the hose ends and concentricity measurements at a minimum of 1/2 inch 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 24 ins 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 20 ins apart on the outer cover of the hose, midway between fittings, after allowing the hose assembly to restabilise 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:

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

   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;

   Δl is the percentage change in length, which will be position (+) 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 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 7/8 inch nominal inside diameter, bend them through 180 degrees over the mandrel; in the case of hose sizes larger than 7/8 inch 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 7/8 inch 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 104°F 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 7/8 inch nominal inside diameter (see Equation 3):

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

b. Hose sizes larger than 7/8 inch 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 and including 7/8 inch shall be bent through 180 degrees and hoses of nominal inside diameter larger than 7/8 inch 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 37.4°F. 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 302°F. 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 41°F.

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 PSI.

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-meticallic plug with an O-ring seal to distance of 3 inches from the end of the tubing, thus providing an average test length of 10 inches. Mercury or salt water solution shall then be added to a level 1 inch 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 60 oz NaCl per gallon of H_20.

1000 V DC shall be applied between the upper electrode and the lower electrode (adapter or male fitting hex). The current shall be measured with an instrument with a sensitivity of at least 1 µA(1 x 10–6 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 1/4 inch less in diameter than the bore or hoses of 1/2 inch nominal inside diameter and larger. For hoses under 1/2 inch nominal inside diameter, a ball or cylinder 1/8 inch smaller in diameter than the bore shall be used.

Hose and Fitting Compatibility

PIRTEK strongly recommends that only PIRTEK hose and fittings are used in an assembly. We do not condone the use of other of brand hose(s) 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 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 and 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 pressure rating.
Operating temperatures
Operating temperatures specified refer to maximum temperature of the fluid or gases being conveyed (with peaks up to 248°F-. 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.

Ambient temperatures
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.

Hose Installation Guide

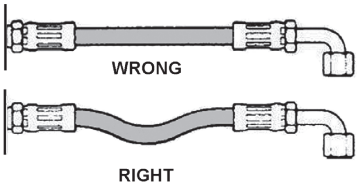
Particular care must be taken to avoid certain conditions when installing hose assemblies. These conditions might arise from :

- 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)

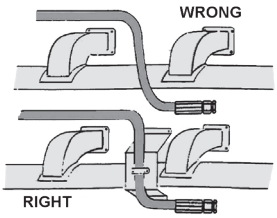
Some situations can result in violation of the hose technical specifications unless the operating conditions of the hose are fully appreciated.
Take note of the examples given on the next page to avoid problems and premature hose failure.

A Word About Twist

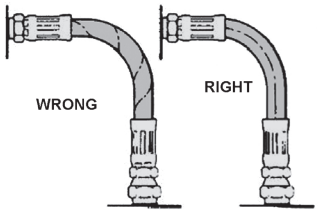
Only 7° of angular twist in an assembly can reduce the expected hose life by up to 80%. Pay particular attention to factors that induce twist and learn to recognise them in the field. Take note also of the allowable tolerance for orientation of elbow fittings (page A 08) when assembling hoses.



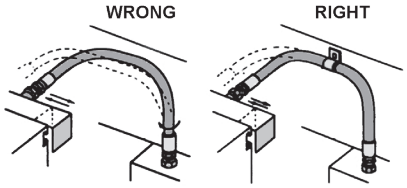
Length may vary +2% to -4% when pressure is applied
Allow enough slack to accommodate this movement



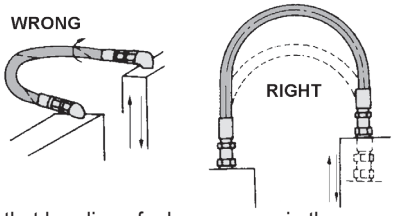
Avoid hot manifolds etc where possible, or isolate with fire sleeve or other protective means



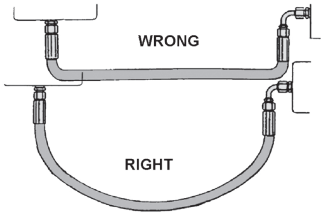
Use the layline to determine that no twist has been induced when tightening. Use 2 spanners to counteract twist



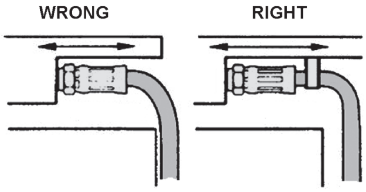
Hose movement in 2 planes can induce twist. A clamp at the nodal point will avoid the need for a swivel



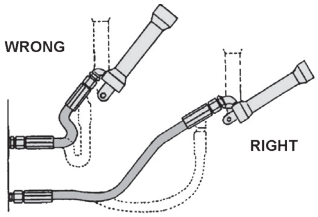
Ensure that bending of a hose occurs in the same plane as the movement of the attachment point to avoid induced twist



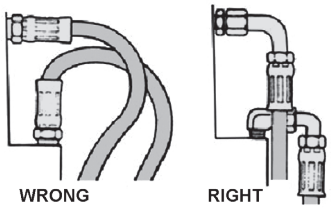
Using too small a bend radius will greatly reduce hose life, and may cause line collapse and flow restriction



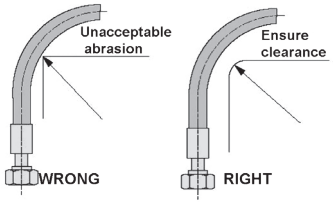
Use clamps to support long runs or keep hose away from moving parts. Clamps mustn't be allowed to move (abrasion)



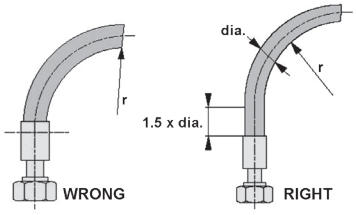
Remember that the metal hose fittings are not part of the flexible portion. Allow ample free length for flexing



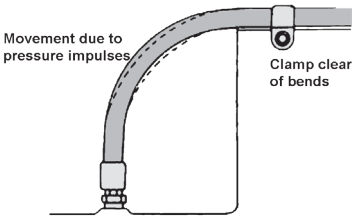
Use elbows and adapters to relieve strain and allow neater installations for easier accessibility and maintenance



Avoid sharp corners

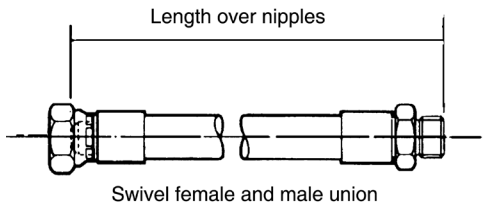


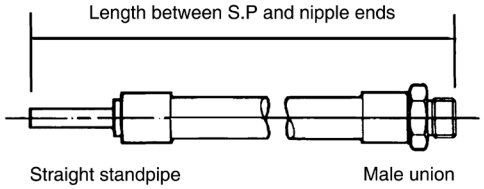
Have a straight section before bending commences. Use a PIRTEK Hose Guard on large multi-spiral hoses to assist

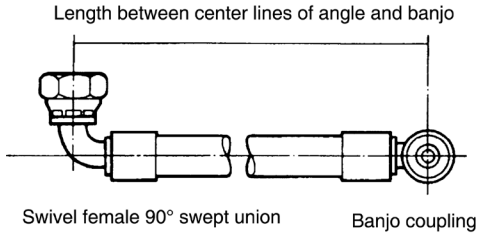


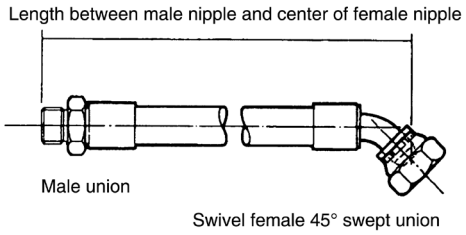
Avoid restricting hose movement around bends. Clamping should occur away from the area of movement

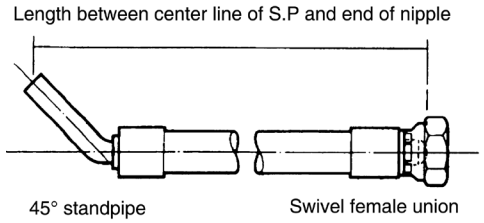
How to measure PIRTEK assemblies

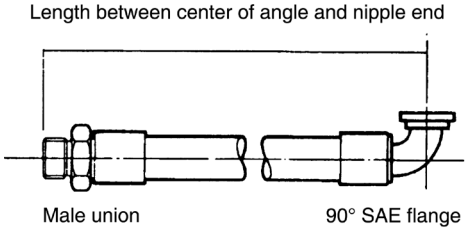








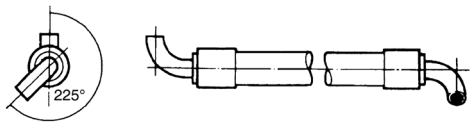




Standard Tolerances

Assembly length

0mm – 12 ins	± 1/8 ins
12 ins – 18 ins	± 1/8 ins
18 ins – 36 ins	± 1/4 ins
36 ins upwards	±1%
Elbow angle	±3°



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

Flow Rate

FLOW V SIZE - PRESSURE LINES

SIZE	MAX FLOW UK GALS / MIN	MAX FLOW US GALS / MIN	MAX FLOW LITRES / MIN	VELOCITY METRES / SEC
3/16	0.9	1.1	4.2	3.93
1/4	1.5	1.85	7	3.68
5/16	2.3	2.8	10.6	3.57
3/8	3.3	4	15.1	3.53
1/2	5.4	6.5	24.6	3.24
5/8	8.3	10	37.9	3.19
3/4	12.5	15	56.8	3.32
1	20.8	25	94.6	3.11
1 1/4	30.8	37	140.1	2.95
1 1/2	45.8	55	208.2	3.04
2	73.3	88	333.1	2.74

FLOW V SIZE - RETURN LINES

SIZE	MAX FLOW UK GALS / MIN	MAX FLOW US GALS / MIN	MAX FLOW LITRES / MIN	VELOCITY METRES / SEC
3/16	0.7	0.8	3.2	2.99
1/4	1.3	1.5	5.7	3.00
5/16	2	2.4	8.9	3.00
3/8	2.8	3.4	12.8	2.99
1/2	5	6	22.8	3.00
5/8	7.8	9.4	35.6	3.00
3/4	11.3	13.6	51.3	3.00
1	20.1	24.2	91.3	3.00
1 1/4	31.4	37.7	142.5	3.00
1 1/2	42.5	54.3	205.2	3.00
2	80.4	96.5	364.8	3.00

FLOW V SIZE - SUCTION LINES

SIZE	MAX FLOW UK GALS / MIN	MAX FLOW US GALS / MIN	MAX FLOW LITRES / MIN	VELOCITY METRES / SEC
3/16	0.3	0.38	1.4	1.31
1/4	0.5	0.16	2.3	1.21
5/16	0.7	0.9	3.4	1.15
3/8	1.1	1.3	4.9	1.15
1/2	1.8	2.15	8.1	1.07
5/8	2.7	3.2	12.1	1.02
3/4	3.4	4.1	15.5	0.91
1	6.7	8	30.3	1.00
1 1/4	10.5	12.6	47.7	1.00
1 1/2	15	18	68.1	1.00
2	26.2	31.5	119.2	0.98
2 1/2	38.2	45.9	173.8	0.91
3	55	66.1	250.2	0.91
3 1/2	74.9	90	340.7	0.91
4	97.4	117	442.9	0.91

These charts indicate the maximum recommended fluid velocity for the hose sizes in the applications set out. It is always recommended to use a larger size if there is doubt as to the flow, but never a smaller size than indicated.

Hose Pressure Flow Chart

Pressure drop in psi (pounds per square inch) gpm (gallons per minute) / for 10 feet of hose (smooth bore) without fittings.

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

U.S. Gallons per minute

Hose ID (inches)	3/16	1/4	5/16	3/8	13/32	1/2	5/8	3/4	7/8	1	11/8	11/4	13/8	11/2	113/16	2
.25	10	3.1														
.50	19	6	2.7													
1	40	12	5.5	2.4												
2	95	24	10	4.8	3.5											
3	185	46	17	7	5	2.2										
4		78	29	12	8	3	1.2									
5		120	44	18	12	4.5	1.6	.72								
8			95	39	26	10	3.6	1.4	.60							
10				59	40	15	5.7	2	1	.55						
12				80	52	20	7.2	2.6	1.5	.75	.43					
15					75	30	10	4.2	2.2	1.2	.67	.38				
18					107	40	15	6.3	3	1.5	.70	.55	.35			
20						49	19	8	3.4	2	1.1	.65	.43	.27		
25						72	26	11	5.5	3	1.6	1	.64	.40	.17	
30							34	14	7	3.6	2.2	1.3	.80	.52	.22	.14
35							47	19	9.5	5	2.8	1.7	1.1	.70	.27	.18
40								25	12	6.5	3.4	2.2	1.4	.90	.38	.24
50								36	17	9	5.3	3.3	2	1.3	.54	.35
60								50	23	12	7.5	4.4	2.8	1.8	.75	.45
70									31	17	9.3	6	3.8	2.4	1	.65
80									38	21	12	7.1	4.6	3	1.2	.76
90									49	27	15	9	5.9	3.8	1.5	1
100										33	19	12	7	4.7	1.9	1.3
150										60	36	22	13	8.5	3.4	2.2
200												36	23	15	6	3.9
250												54	33	22	8.5	5.3
300													45	29	12	7.5
400														51	21	14
500															32	20
800																
1000																

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^2)	Square inches (ins^2)	cm2 x 0.155 = ins^2	ins^2 x 6.452 = cm^2
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^3)	Cubic Feet (ft^3)	cm3 x 0.061 = ft^3	ft^3 x 16.39 = cm^3
	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
	Megapascals (MPa)	Pounds / square inch (psi)	MPa x 145 = psi	psi x 0.068 = MPa
Density	Gram / cubic centimetre (gr / cm^3)	Pounds / cubic inch (lb / ins^3)	gr/cm^3 x 0.03613 = lb/ins^3	lb/ins^3 x 27.68 = gr/cm^3
Temperature	Degrees Celsius (^OC)	Degrees Fahrenheit (^OF)	(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
41/46	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 / cm²	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

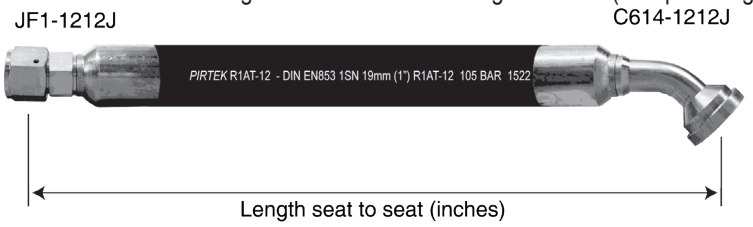
P.S.I. TO BAR				
PSI	Kilopascals	Megapascals	Kg / cm²	BAR
10	69	0.069	0.7	0.69
20	138	0.138	1.4	1.38
30	207	0.207	2.1	2.07
40	276	0.276	2.8	2.76
50	345	0.345	3.5	3.45
60	414	0.414	4.2	4.14
70	483	0.483	4.9	4.83
80	552	0.552	5.6	5.52
90	621	0.621	6.3	6.21
100	689	0.689	7.0	6.89
200	1379	1.379	14.1	13.79
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

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 Catalog Section B (except Mining Fittings Section U)



If spiral guard PSAW-25 were fitted over the full length, the designation would be:

R1AT-12 / JF1-1212J / C614-1212J / 48 / PSAW-25

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

R1AT-12 / C614-1212J / 48 / 0

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

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 to the tabulated number of hex flats, using the reference marks as a guide.

Thread BSPT	Tube Size	Gauge Length Turns of Thread	Max. Turns of Thread incl. Fitting Allowance	Recommended Thread Engagement inches
1/4 - 19	4	4½	7¼	0.24
3/8 - 19	6	4¾	7½	0.33
1/2 - 14	8	4½	7¼	0.33
3/4 - 14	12	5¼	8	0.46
1 - 11	16	4½	7¼	0.46
1¼ - 11	20	5½	8¼	0.59
1½ - 11	24	5½	8¼	0.59
2 - 11	32	$6^{7}/_{8}$	$10^{1}/_{8}$	0.59

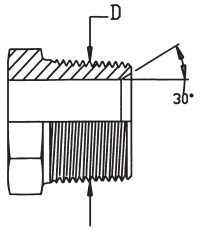
Table 1 BSPT Thread Engagement
Recommended Thread Engagement lengths for NPT fittings are the same as for BSPT

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	117-129	1.1/4
1.5/16-12	16	127-140	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

Thread Identification

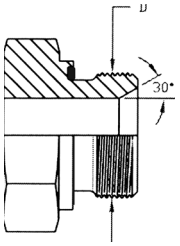
BRITISH STANDARD PIPE TAPER MALE - (BSPT)



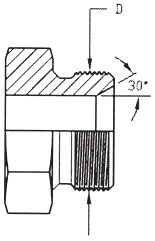
Applicable Standards
Thread Form: AS 1722.1-1975, ISO 7
Materials Available: S12L14 (Mild Steel) 316 (Stainless Steel)
GB12361-12362 Part II (Drop Forged)

Pipe Size	Dash Size	Nominal Thread Size & Pitch	Max Work Press (psi)	Thread OD 'D' on Diagram	
				mm	in
1/8"	2	1/8" - 28	10,007	9.73	0.383
1/4"	4	1/4" - 19	9427	13.16	0.518
3/8"	6	3/8" - 19	7977	16.67	0.656
1/2"	8	1/2" - 14	410	20.96	0.825
5/8" *	10	5/8" - 14	5946	22.91	0.902
3/4"	12	3/4" - 14	4931	26.45	1.041
1"	16	1" - 11	3988	33.25	1.309
1 1/4"	20	1 1/4" - 11	2900	41.91	1.650
1 1/2"	24	1 1/2" - 11	2030	47.81	1.882
2"	32	2" - 11	2030	59.62	2.347

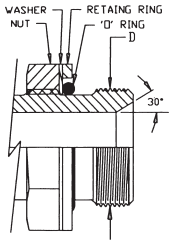
BRITISH STANDARD PIPE PARALLEL MALE - (BSPP)



Applicable Standards
Thread Form: AS 1722.2-1992, ISO 228
Seal: DIN 3852 Part 11 Form E
Materials Available: S12L14 (Mild Steel) 316 Stainless Steel GB12361-12362 Part II (Drop Forged)



Applicable Standards
Thread Form: AS 1722.2-1992, ISO 228
Seal: DIN 3852 Part 2 Form B
Materials Available: S12L14 (Mild Steel) GB12361-12362 Part II (Drop-Forged)



Applicable Standards
Thread Form: AS 1722.2-1992, ISO 228
Seal: ISO 1179-3 Form G
Materials Available: S12L14 (Mild Steel) GB12361-12362 Part II (Drop-Forged)

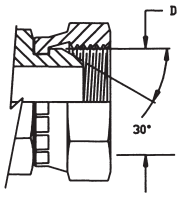
Pipe Size	Dash Size	Correct Torque (ft/lbf)	Nominal Thread Size & Pitch	Max Work Press (psi)		Thread OD 'D' on Diagram	
				Fixed	Adj.	mm	ins
1/8"	2	15	1/8" - 28	8702	5076	9.73	0.383
1/4"	4	37	1/4" - 19	8702	5801	13.16	0.518
3/8"	6	59	3/8" - 19	8702	5801	16.67	0.656
1/2"	8	74	1/2" - 14	5801	5076	20.96	0.825
5/8" *	10	89	5/8" - 14	5801	3988	22.91	0.902
3/4"	12	147	3/4" - 14	5801	4568	26.45	1.041
1"	16	280	1" - 11	5801	3625	33.25	1.309
1 1/4"	20	368	1. 1/4" - 11	5511	2900	41.91	1.650
1 1/2"	24	442	1 .1/2" - 11	5511	2320	47.81	1.882
2"	32	553	2" - 11	3625	1812	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

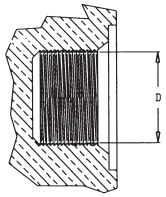
BRITISH STANDARD PIPE

PARALLEL FEMALE - (BSPP)

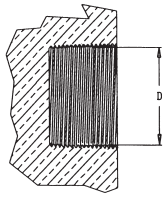


Applicable Standards
Thread Form: AS 1722.2-1992, ISO 228
Materials Available: S12L14 (Mild Steel) GB12361-12362 Part II (Drop-Forged) 316 Stainless Steel

TAPER FEMALE - (BSPT)



Applicable Standards
Thread Form: AS 1722.2-1992, ISO 228
Sealing area: DIN 3852 Part 2 Form X



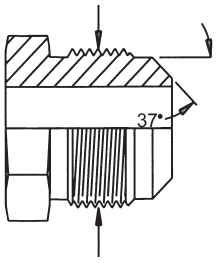
Applicable Standards
Thread Form: AS 1722.2-1992, ISO 228
Materials Available: S12L14 (Mild Steel) GB12361-12362 Part II (Drop-Forged) 316 Stainless Steel

Pipe Size	Dash Size	Correct Torque (ft/lbf)	Nominal Thread Size & Pitch	Max Work Press (psi)		Thread ID 'D' on Diagram	
				Fixed	Swivel	mm	ins
1/8"	2	15	1/8" - 28	7977	7977	8.59	0.338
1/4"	4	37	1/4" - 19	7977	7977	11.46	0.451
3/8"	6	59	3/8" - 19	7541	7541	14.96	0.589
1/2"	8	74	1/2" - 14	5511	5511	18.65	0.734
5/8" *	10	89	5/8" - 14	3988	3988	20.6	0.811
3/4"	12	147	3/4" - 14	3988	3988	24.13	0.95
1"	16	280	1" - 11	3480	3480	30.3	1.193
1 1/4"	20	368	1 .1/4" - 11	2900	2900	38.97	1.534
1 1/2"	24	442	1. 1/2" - 11	2538	2538	44.86	1.766
2"	32	553	2" - 11	2030	2030	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.

Thread Identification

JOINT INDUSTRY COUNCIL - (JIC) - MALE

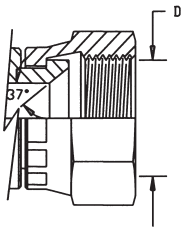


Applicable Standards
Thread Form: SAE J514
Materials Available: S12L14 (Mild Steel) 316 (Stainless Steel) GB12361-12362 Part II (Drop Forged)

Dash Size	Nominal Tube Size in	Correct Torque ft/lbf	Nominal Thread Size & Pitch	Max Working Pressure (psi)	Thread OD 'D' on Diagram	
					mm	in
02	1/8"	6 - 7	5/16" - 24	-	7.87	.310
03	3/16"	8 - 9	3/8" - 24	-	9.65	.380
04	1/4"	11 - 12	7/16" - 20	8629	11.07	.436
05	5/16"	14 - 16	1/2" - 20	8629	12.70	.500
06	3/8"	18 - 21	9/16" - 18	7106	14.25	.561
08	1/2"	36 - 39	3/4" - 16	6091	19.00	.748
10	5/8"	57 - 63	7/8" - 14	5583	22.17	.873
12	3/4"	79 - 88	1 1/16" - 12	4061	26.95	1.061
14	7/8"	86 - 96	1 3/16" - 12	4061	30.10	1.188
16	1"	94 - 104	1 5/16" - 12	3553	33.30	1.311
20	1 1/4"	127 - 133	1 5/8" - 12	3553	41.22	1.623
24	1 1/2"	159 - 167	1 7/8" - 12	2030	47.57	1.873
32	2"	245 - 258	2 1/2" - 12	1522	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
Materials Available: S12L14 (Mild Steel) 316 (Stainless Steel) GB12361-12362 Part II (Drop Forged)

Dash Size	Nominal Tube Size in	Correct Torque ft/lbf	Nominal Thread Size & Pitch	Max Working Pressure (psi)	Thread ID 'D' on Diagram	
					mm	in
02	1/8"	6 - 7	5/16" - 24	-	6.85	.270
03	3/16"	8 - 9	3/8" - 24	-	8.63	.340
04	1/4"	11 - 12	7/16" - 20	5583	10.00	.394
05	5/16"	14 - 16	1/2" - 20	5076	11.60	.457
06	3/8"	18 - 21	9/16" - 18	5003	13.00	.512
08	1/2"	36 - 39	3/4" - 16	4496	17.60	.693
10	5/8"	57- 63	7/8" - 14	3480	20.50	.807
12	3/4"	79 - 88	1 1/16" - 12	3480	25.00	.985
14	7/8"	86 - 96	1 3/16" - 12	3045	28.09	1.106
16	1"	94 - 104	1 5/16" - 12	3045	31.30	1.233
20	1 1/4"	127 - 133	1 5/8" - 12	2465	39.20	1.544
24	1 1/2"	159 - 167	1 7/8" - 12	2030	45.60	1.796
32	2"	245 - 258	2 1/2" - 12	1522	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 TAILS)

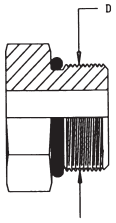
IMPORTANT SAFETY NOTE: While PIRTEK's thread termination pressure ratings exceed those stipulated in the respective Standards, discretion must be used prior to selection for appropriate applications. These test pressures correlate to material S12L14

Dash Size	Nominal Tube Size in	Correct Torque ft/lbf	Nominal Thread Size & Pitch	Actual Max Work Pressure (psi)	Min. Burst Press (psi)	No. of Wrench Flats from Wrench Resistance
02	1/8"	6-7	5/16" - 24	N/A	N/A	
03	3/16"	8-9	3/8" - 24	N/A	N/A	
04	1/4"	11-12	7/16" - 20	6091 *c	24366	2
05	5/16"	14-16	1/2" - 20	6091 *c	24366	2
06	3/8"	18-21	9/16" - 18	6091 *c	24366	1.1/2
08	1/2"	36-39	3/4" - 16	6091 *c	24366	1.1/2
10	5/8"	57-63	7/8" - 14	6091 *c	24366	1.1/2
12	3/4"	79-88	1 1/16" - 12	6091 *c	24366	1.1/4
14	7/8"	86-96	1 3/16" - 12	6091 *c	24366	1.1/4
16	1"	94-104	1 5/16" - 12	6091 *w	24366	1
20	1 1/4"	127-133	1 5/8" - 12	6091 *w	24366	1
24	1 1/2"	159-167	1 7/8" - 12	6091 *w	24366	1
32	2"	245-258	2 1/2" - 12	3045 *w	12183	1

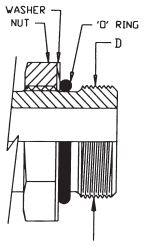
*c = Crimped Nut *w = Wire Nut
Note: The hex flats from finger tight method is recommended for 37° and 45° flare fittings. The torque values given are for plated carbon steel components without lubrication.
See page 15

Thread Identification

UNIFIED NATIONAL O RING - (UN-O)



Applicable Standards
Thread Form: SAE J1926, ISO 11926-1
Materials Available: S12L14 (Mild-Steel)



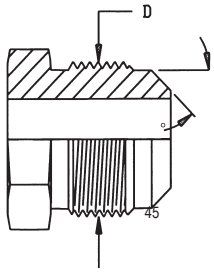
Applicable Standards
Thread Form: SAE J1926, ISO 11926-1
Materials Available: S12L14 (Mild-Steel)

Adjustable type

Pipe Size	Dash Size	Correct Torque (ft/lbf)	Nominal Thread Size & Pitch	Max Working Pressure (psi)		Thread OD 'D' on Diagram	
				Fixed	Adj.	mm	ins
2	1/8"	6 - 7	5/16" - 24	9137	6091	7.87	0.31
3	3/16"	8 - 9	3/8" - 24	9137	6091	9.65	0.38
4	1/4"	13 - 15	7/16" - 20	9137	6091	11.07	0.44
5	5/16"	17 - 19	1/2" - 20	9137	6091	12.70	0.50
6	3/8"	21 - 24	9/16" - 18	9137	6091	14.25	0.56
08	1/2"	36 - 39	3/4" - 16	9137	6091	19.00	0.75
10	5/8"	44 - 47	7/8" - 14	9137	6091	22.17	0.87
12	3/4"	69 - 75	1. 1/16" - 12	6091	6091	26.95	1.06
16	1"	90 - 99	1. 5/16" - 12	6091	5076	33.30	1.31
20	1 1/4"	146 - 160	1. 5/8" - 12	4568	4568	41.22	1.62
24	1 1/2"	154 - 170	1. 7/8" - 12	4061	3045	47.57	1.87
32	2"	218 - 240	2. 1 /2" - 12	-	-	63.45	2.50

Note: The hex flats from finger tight method is recommended for UN-O fittings. The torque values given are for plated carbon steel components without lubrication.
See page 15

SOCIETY OF AUTOMOTIVE ENGINEERS - (SAE) - MALE



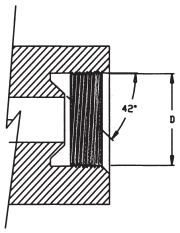
Applicable Standards
Thread Form: SAE J512
Materials Available: S12L14 (Mild Steel)
352 DR Brass Alloy GB12361-12362 Part II
(Drop Forged)

Dash Size	Nominal Tube Size in	Nominal Thread Size & Pitch	Maximum Working Pressure (psi)		Thread OD 'D' on Diagram	
			Steel	Brass	mm	in
2	1/8"	5/16" - 24	5003	3437	7.87	0.31
3	3/16"	3/8" - 24	5003	3205	9.65	0.38
4	1/4"	7/16" - 20	4496	2349	11.07	0.44
5	5/16"	1/2" - 20	3988	1827	12.70	0.50
6S	3/8"	5/8" - 18	3988	1479	15.85	0.62
8	1/2"	3/4" - 16	3988	1073	19.00	0.75
10	5/8"	7/8" - 14	3045	696	22.17	0.87
12	3/4"	1 .1/16" - 14	3045	-	26.95	1.06
14	7/8"	1. 1 /4" - 12	2465	-	29.46	1.16
16	1"	1. 3/8" - 12	2465	-	35.05	1.38

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

Thread Identification

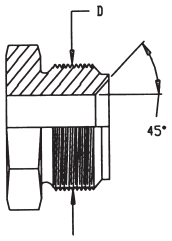
SOCIETY OF AUTOMOTIVE ENGINEERS - (SAE) - INVERTED FLARE FEMALE



Applicable Standards
Thread Form: SAE J512
Materials Available: 352 DR Brass Alloy

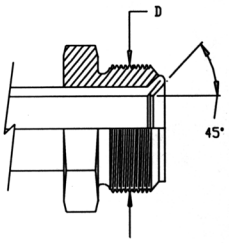
Dash Size	Nominal Tube Size (ins)	Nominal Thread Size & Pitch	Max Work Pressure (psi)		Thread ID 'D' on Diagram	
			Steel	Brass	mm	in
2	1/8"	5/16" - 28	4641	3437	6.85	0.27
3	3/16"	3/8" - 24	4931	3205	8.63	0.34
4	1/4"	7/16" - 24	3916	2349	10.00	0.39
5	5/16"	1/2"- 20	3263	1827	11.60	0.46
6	3/8"	5/8" - 18	3263	1479	14.70	0.58
7	7/16"	11/16" - 18	3335	1073	15.70	0.62
8	1/2"	3/4" - 18	3118	696	17.60	0.69
10	5/8"	7/8" - 18	3118	-	22.10	0.87
12	3/4"	1 .1/16" - 16	3118	-	25.30	1.00

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



Applicable Standards
Thread Form: SAE J512
Materials Available: S12L14 (Mild Steel)
352 DR Brass Alloy

Adapter Version



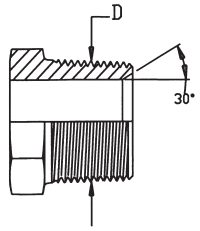
Applicable Standards
Thread Form: SAE J512
Materials Available: S12L14 (Mild Steel)
352 DR Brass Alloy

Tube version

Pipe Size	Dash Size	Nominal Thread Size & Pitch	Max Work Press (psi) - SAE J1065		Thread OD 'D' on Diagram	
			Fixed	Adj.	mm	ins
2	1/8"	5/16" - 28	4641	3437	7.87	0.31
3	3/16"	3/8" - 24	4931	3205	9.65	0.38
4	1/4"	7/16" - 24	3916	2349	11.07	0.44
5	5/16"	1/2"- 20	3263	1827	12.70	0.50
6	3/8"	5/8" - 18	3263	1479	15.85	0.62
7	7/16"	11/16" - 18	3335	1073	17.46	0.69
8	1/2"	3/4" - 18	3118	696	19.00	0.75
10	5/8"	7/8" - 18	3118	-	22.17	0.87
12	3/4"	1. 1/16" - 16	3115	-	26.95	1.06

Thread Identification

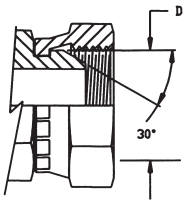
NATIONAL PIPE TAPER FUEL- (NPTF)



Applicable Standards
Thread Form: SAE J476
Materials Available: S12L14 (Mild Steel) 316 (Stainless Steel)
GB12361-12362 Part II (Drop Forged)

Pipe Size	Dash Size	Nominal Thread Size & Pitch	Max Work Press (psi)	Thread OD 'D' on Diagram	
				mm	in
1/8"	2	1/8" - 27	10152	10.32	0.406
1/4"	4	1/4" - 18	9499	13.89	0.546
3/8"	6	3/8" - 18	8122	17.06	0.671
1/2"	8	1/2" - 14	6091	21.43	0.843
3/4"	12	3/4" - 14	5076	26.98	1.062
1"	16	1" - 11. 1/2	4061	33.33	1.312
1 1/4"	20	1 1/4" - 11. 1/2	3045	42.46	1.671
1 1/2"	24	1 1/2" - 11. 1/2	2030	48.42	1.906
2"	32	2" - 11. 1/2	2030	60.32	2.375

NATIONAL PIPE STRAIGHT MECHANICAL - (NPSM)

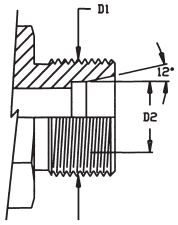


Applicable Standards
Thread Form: SAE J476
Materials Available: S12L14 (Mild Steel) 316 (Stainless Steel)
GB12361-12362 Part II (Drop Forged)

Pipe Size	Dash Size	Nominal Thread Size & Pitch	Max Work Press (psi)	Thread OD 'D' on Diagram	
				mm	in
1/8"	2	1/8" - 27	6091	9.12	.359
1/4"	4	1/4" - 18	5076	11.91	.468
3/8"	6	3/8" - 18	4061	15.08	.593
1/2"	8	1/2" - 14	3553	19.05	.750
3/4"	12	3/4" - 14	3553	24.21	0.953
1"	16	1" - 11. 1/2	3045	30.56	1.203
1 1/4"	20	1 1/4" - 11. 1/2	2030	38.89	1.531
1 1/2"	24	1 1/2" - 11. 1/2	1522	45.24	1.781
2"	32	2" - 11. 1/2	1522	57.15	2.250

Thread Identification

METRIC MALE 'DKL' LIGHT SERIES

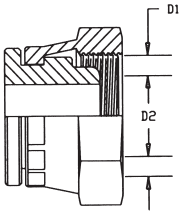


Applicable Standards
Thread Form: DIN 2353, DIN 3861, DIN 3901, DIN 3902
Materials Available: S12L14 (Mild Steel) 316 (Stainless Steel) GB12361-12362 Part II (Drop Forged)

Dash Size	Nominal Tube Size 'D2' mm	Correct Torque ft/lbf	Nominal Thread Size & Pitch	Max Work Press (psi) DIN2401 Pt 1	Thread OD 'D1' on Diagram
-12	6	15	M12 - 1.5	4568	12
-14	8	26	M14 - 1.5	4568	14
-16	10	30	M16 - 1.5	4568	16
-18	12	33	M18 - 1.5	4568	18
-22	15	41	M22 - 1.5	2320	22
-26	18	81	M26 - 1.5	2320	26
-30	22	96	M30 - 2.0	2320	30
-36	28	147	M36 - 2.0	2320	36
-45	35	162	M45 - 2.0	2320	45
-52	42	177	M52 - 2.0	2320	52

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

METRIC FEMALE 'DKL' LIGHT SERIES



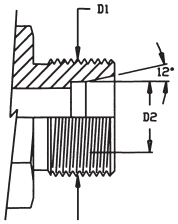
Applicable Standards
Thread Form: DIN 2353 DIN 3861 DIN 3901 DIN 3902
Materials Available: S12L14 (Mild Steel) 316 (Stainless Steel) GB12361-12362 Part II (Drop Forged)

Dash Size	Nominal Tube Size 'D2' mm	Correct Torque ft/lbf	Nominal Thread Size & Pitch	Max Work Press (psi) DIN2401 Pt 1	Thread ID 'D1' on Diagram
-12	6	15	M12 - 1.5	4568	10.5
-14	8	26	M14 - 1.5	4568	12.5
-16	10	30	M16 - 1.5	4568	14.5
-18	12	33	M18 - 1.5	4568	16.5
-22	15	41	M22 - 1.5	2320	20.5
-26	18	81	M26 - 1.5	2320	24.5
-30	22	96	M30 - 2.0	2320	28.0
-36	28	147	M36 - 2.0	2320	34.0
-45	35	162	M45 - 2.0	2320	43.0
-52	42	177	M52 - 2.0	2320	50.0

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

Thread Identification

METRIC MALE ‘DKS’ HEAVY SERIES

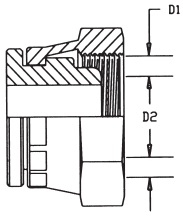


Applicable Standards
Thread Form: DIN 2353, DIN 3861, DIN-3901, DIN 3902
Materials Available: S12L14 (Mild Steel) 316 (Stainless Steel) GB12361-12362 Part II (Drop Forged)

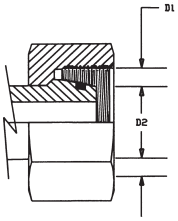
Dash Size	Nominal Tube Size ‘D2’ mm	Correct Torque ft/lbf	Nominal Thread Size & Pitch	Max Work Press (psi) DIN2401 Pt 1	Thread OD ‘D1’ on Diagram
-14	6	30	M14 - 1.5	9137	14
-16	8	33	M16 - 1.5	9137	16
-18	10	37	M18 - 1.5	9137	18
-20	12	44	M20 - 1.5	9137	20
-22	14	59	M22 - 1.5	9137	22
-24	16	74	M24 - 1.5	5801	24
-30	20	118	M30 - 2.0	5801	30
-36	25	177	M36 - 2.0	5801	36
-42	30	192	M42 - 2.0	5801	45
-52	38	258	M52 - 2.0	4568	52

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

METRIC FEMALE ‘DKS’ HEAVY SERIES



Applicable Standards
Thread Form: DIN 2353 DIN 3861 DIN-3901 DIN 3902
Materials Available: S12L14 (Mild Steel) 316 (Stainless Steel) GB12361-12362 Part II (Drop Forged)



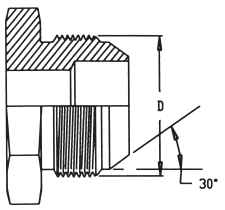
Applicable Standards
Thread Form: DIN 2353 DIN 3861 DIN-3901 DIN 3902
Materials Available: S12L14 (Mild Steel) 316 (Stainless Steel) GB12361-12362 Part II (Drop Forged)

Dash Size	Nominal Tube Size ‘D2’ mm	Correct Torque lb/lbf	Nominal Thread Size & Pitch	Max Work Press (psi) DIN2401 Pt 1	Thread ID ‘D1’ on Diagram (mm)
-14	6	30	M14 - 1.5	9137	12.5
-16	8	33	M16 - 1.5	9137	14.5
-18	10	37	M18 - 1.5	9137	16.5
-20	12	44	M20 - 1.5	9137	18.5
-22	14	59	M22 - 1.5	9137	20.5
-24	16	74	M24 - 1.5	5801	22.5
-30	20	118	M30 - 2.0	5801	28.0
-36	25	177	M36 - 2.0	5801	34.0
-42	30	192	M42 - 2.0	5801	40.0
-52	38	258	M52 - 2.0	4568	50.0

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

Thread Identification

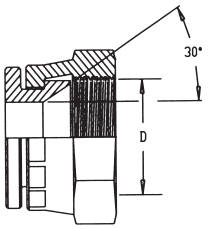
JAPANESE INDUSTRIAL STANDARD MALE - BSPP



Applicable Standards
Thread Form: JIS B8363
Materials Available: S12L14 (Mild Steel) GB12361-12362 Part II (Drop Forged)

Dash Size	Nominal		Nominal Thread Size & Pitch	Max Work Press (psi)	Thread ID 'D' on Diagram	
	Tube Size	Thread				
	ins	mm			mm	in
2	1/8"	3.2	1/8" - 28	5076	9.73	0.383
4	1/4"	6.4	1/4" - 19	5076	13.16	0.518
6	3/8"	10	3/8" - 19	5076	16.67	0.656
8	1/2"	12	1/2" - 14	5076	20.96	0.825
12	3/4"	19	3/4" - 14	3988	26.45	1.041
16	1"	25	1" - 11	3045	33.25	1.309
20	1 1/4"	32	1. 1/4" - 11	2465	41.91	1.65
24	1 1/2"	38	1..1/2" - 11	1522	47.81	1.882
32	2"	50	2" - 11	1522	59.62	2.347

JAPANESE INDUSTRIAL STANDARD FEMALE - BSPP

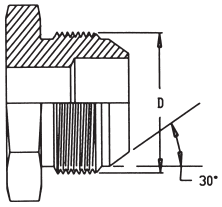


Applicable Standards
Thread Form: JIS B8363
Materials Available: S12L14 (Mild Steel) GB12361-12362 Part II (Drop Forged)

Dash Size	Nominal		Nominal Thread Size & Pitch	Max Work Press (psi)	Thread ID 'D' on Diagram	
	Tube Size	Thread				
	ins	mm			mm	in
2	1/8"	3.2	1/8" - 28	5076	8.59	0.338
4	1/4"	6.4	1/4" - 19	5076	11.46	0.451
6	3/8"	10	3/8" - 19	5076	14.96	0.589
8	1/2"	12	1/2" - 14	5076	18.65	0.734
12	3/4"	19	3/4" - 14	3988	24.13	0.95
16	1"	25	1" - 11	3045	30.3	1.193
20	1 1/4"	32	1. 1/4" - 11	2465	38.97	1.534
24	1 1/2"	38	1. 1/2" - 11	1522	44.86	1.766
32	2"	50	2" - 11	1522	56.67	2.231

Thread Identification

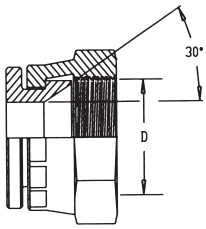
JAPANESE INDUSTRIAL STANDARD KOMATSU MALE - METRIC



Applicable Standards
Thread Form: JIS B8363
Materials Available: S12L14 (Mild Steel) GB12361-12362 Part II (Drop Forged)

Dash Size	Nominal		Nominal Thread Size & Pitch	Max Work Press (psi)	Thread ID 'D' on Diagram	
	Tube Size	Thread				
	ins	mm			mm	in
12			12 - 1.5		12	0.472
14	1/4"	6.4	14 - 1.5		14	0.551
16			16 - 1.5		16	0.629
18	3/8"	10	18 - 1.5		18	0.708
20			20 - 1.5		20	0.787
22	1/2"	12	22 - 1.5		22	0.866
24			24 - 1.5		24	0.944
30	3/4"	19	30 - 1.5		30	1.181
33	1"	25	33 - 1.5		33	1.299
36			36 - 1.5		36	1.417
42			42 - 1.5		42	1.653

JAPANESE INDUSTRIAL STANDARD KOMATSU FEMALE - METRIC



Applicable Standards
Thread Form: JIS B8363
Materials Available: S12L14 (Mild Steel) GB12361-12362 Part II (Drop Forged)

Dash Size	Nominal		Nominal Thread Size & Pitch	Max Work Press (psi)	Thread ID 'D' on Diagram	
	Tube Size	Thread				
	ins	mm			mm	in
12			12 - 1.5		10.5	0.413
14	1/4"	6.4	14 - 1.5		12.5	0.492
16			16 - 1.5		14.5	0.571
18	3/8"	10	18 - 1.5		16.5	0.649
20			20 - 1.5		18.5	0.728
22	1/2"	12	22 - 1.5		20.5	0.807
24			24 - 1.5		22.5	0.886
30	3/4"	19	30 - 1.5		28.5	1.122
33	1"	25	33 - 1.5		31.5	1.240
36			36 - 1.5		34.5	1.358
42			42 - 1.5		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'.

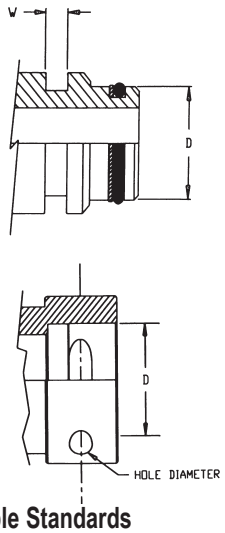
Staplelok has become the predominant hydraulic hose fitting world wide in underground coal mining.

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



Applicable Standards
Thread Form: DIN 20 043 + SAE J1467
PIRTEK adapters meet or exceed DIN20043, BS6537, and NCB638 requirements
Materials Available: See below

Size	Nom. Tube Size		'W' or Hole Dia mm		'D' on Diagram mm		Max. Working Pressure (psi) (Based on Use of St. Steel 'D' Staples)
	in	mm	Male	Fem	Male	Female	
6	1/4"	4	5.1	6	9.9	15.1	7251
10	3/8"	6	5.1	6	13.9	20.1	6091
13	1/2"	8	5.1	6	17.9	24.1	6091
20	3/4"	12	5.1	6	23.9	29.1	5076
25	1"	16	7.1	8.5	30.9	39.1	4061
32	1.1/4"	20	7.1	8.5	37.9	46.1	3045
40	1.1/2"	24	7.2	9	46.9	55.2	2683
50	2"	32	7.2	9	55.9	64.2	2683
63	2.1/2"	40	7.2	9	60.8	80.9	1015

Materials Used in PIRTEK Standard Staplelok Adapters:

- from ¼" to 2" material conforms to BS970-220M07/C45
- 2-1/2" material 50 D (BS 4360-90) (UNI EN S355J2G3 extruded tube)

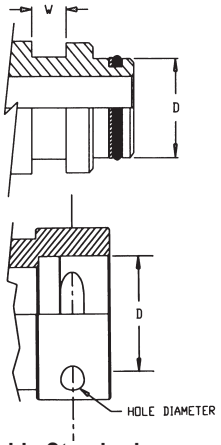
Stainless Steel staples of all types conform to 420S45 (1.4028) (X30Cr13) in BS EN10088-2:2005.

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 depressurization 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 *



Applicable Standards
Not covered by Standard

Thread Form:

Materials Available: See below

Size	Nom. Tube Size		'W' or Hole Dia mm		'D' on Diagram mm		Max. Working Pressure (psi)
	in	mm	Male	Fem	Male	Female	(Based on Use of St. Steel 'D' Staples)
13	1/2"	8	9.1	9.1	15.9	24.3	7541
20	3/4"	12	9.1	9.1	21.9	29.3	6091
25	1"	16	13.1	13.6	30.9	39.6	6091
32	1.1/4"	20	13.1	13.6	37.9	46.6	6091
40	1.1/2"	24	13.1	13.6	43.9	55.6	6091
50	2"	32	13.1	13.6	49.9	64.6	6091

* Not covered by Standard

Materials Used in PIRTEK Super Staplelok Adapters:

- from ¾" to 2" body material conforms to 212 A42
- 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 by way of the male hand nut and collar OD or female body OD and bore measurements.

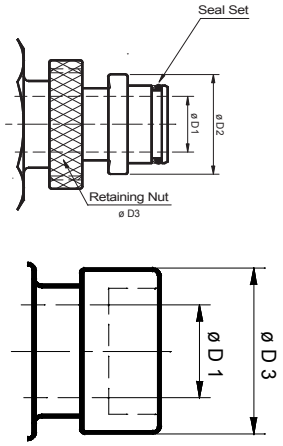
Advantages: Allows connections to be made in confined spaces and in difficult environments. No torsional load is applied in the fitting, and connection is easy, with no need of spanners. The slim external profile of the coupling does not protrude beyond the hose outside diameter in most cases, and overall 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 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 MDG41 compliance is demanded.

SKV MALE & FEMALE



Materials Available: See below

Size	Nom. Tube Size		'D1' or Hole Dia mm		'D2' on Diagram mm		'D3' on Diagram mm		Max. Pressure (psi)	
	ins	mm	Male	Female	Male	Female	Male	Female	WP	Burst
06	1/4"	6	-	-	-	-	-	-	-	-
10	3/8"	10	7	7	20	-	25	20	-	-
13	1/2"	13	9.8	9.8	22	-	28	22	-	-
20	3/4"	20	15	15	28	-	36	28	-	-
25	1"	25	19	19	33	-	42	33	4061	16244
32	1 1/4"	32	24	24	39.8	-	50	39.8	3045	12183
40	1 1/2"	40	32	32	53	-	62	53	2683	10732
50	2"	50	44	44	65	-	75	65	2393	9572
63	2 1/2"	63	55	55	75	-	85	75	1015	4061
76	3"	76							1015	4061
100	4"	100							928	3712

Materials Used in PIRTEK SKV Adapters:

- from ¼" to 2" material conforms to BS970-220M07/C45

Thread Identification

SKV / SSKV ASSEMBLY PROCEDURE

Step 1:

Ensure you have the appropriate SKV / SSKV components

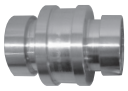
The SKV / SSKV connections comprise:

- Support Clip

- Shell

- Male End w/- Retaining Nut

- Female End



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.

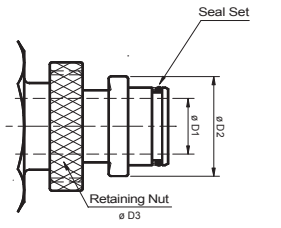
Step 3:

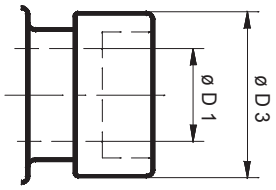
Fit the spring supported Shell over the mating male and female connection and ensure that it is a snug fit into the grooves, equally ensuring that the two halves of the shell meet and align. Ensure that the split in the Shell is level, parallel and forms a complete closed diameter to ensure that it is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

SSKV MALE & FEMALE *





Materials Available: See below

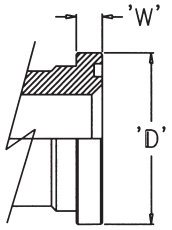
Size	Nom. Tube Size		'D1' or Hole Dia mm		'D2' on Diagram mm		'D3' on Diagram mm		Max. Pressure (psi)	
	ins	mm	Male	Female	Male	Female	Male	Female	W.P.	Burst
06	1/4"	6	-	-	-	-	-	-	-	-
10	3/8"	10	7	7	18	18.1	25	25	6091	24366
13	1/2"	13	10	10	22	22.1	28	28	6091	24366
20	3/4"	20	15	15	28	28.1	36	36	6091	24366
25	1"	25	18.5	18.5	35	35.1	45	45	6091	24366
32	1 1/4"	32	24	24	44	44.1	52	52	6091	24366
40	1 1/2"	40	30	30	54	54.1	64	64	6091	24366
50	2"	50	40	40	70	70.1	78	78	6091	24366
63 *	2 1/2"	63	50	50	84	84.1	97	97	5076	20305

Materials Used in PIRTEK SSKV Adapters:

- from 3/8" to 2.1/2" body material conforms to 212 A42

Thread Identification

SAE J518 CODE 61 FLANGE



Applicable Standards

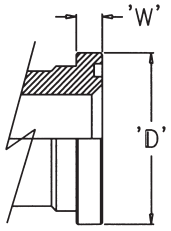
Thread Form: SAE J518

Materials Available: S12L14 (Mild Steel)
GB12361-12362 Part II (Drop Forged)

Dash Size	Nominal Tube Size		'W' on Diagram		Max Work Press.	Flange OD 'D' on Diagram	
	ins	mm	ins	mm	psi	ins	mm
8	1/2"	12.7	0.265	6.73	5076	1.188	30.18
10 †	5/8"	16	0.265	6.73	5076	1.340	34
12	3/4"	19	0.265	6.73	5076	1.500	38.1
16	1"	25.4	0.315	8	5076	1.750	44.45
20	1 .1/4"	32	0.315	8	4061	2.000	50.8
24	1 .1/2"	38	0.315	8	3045	2.375	60.33
32	2"	51	0.375	9.53	3045	2.812	71.42
40	2 .1/2"	63.5	0.375	9.53	2755	3.312	84.12

† 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 catalog Section B 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



Applicable Standards

Thread Form: SAE J518

Materials Available: S12L14 (Mild Steel)
GB12361-12362 Part II (Drop Forged)

Dash Size	Nominal Tube Size		'W' on Diagram		Max Work Press.	Flange OD 'D' on Diagram	
	ins	mm	ins	mm	psi	ins	mm
8	1/2"	12.7	0.305	7.75	6091	1.250	31.750
12	3/4"	19	0.345	8.76	6091	1.625	41.280
16	1"	25.4	0.375	9.53	6091	1.875	47.630
20	1 .1/4"	32	0.405	10.29	6091	2.125	53.980
24	1 .1/2"	38	0.495	12.57	6091	2.500	63.500
32	2"	51	0.495	12.57	6091	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 catalog Section B 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.

PIRTEK has available a range of fittings that conform to the dimensions of the new fittings. Please refer to Fittings Catalog Section B for detail. Product Codes follow Code 62 guidelines, but have a suffix 'C' to differentiate them eg C621C

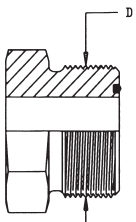
No SAE Standard has been published as yet for the flanges

Flange Size		Associated Bolt Details for Flange Clamps									
		Code 61				Code 62 and Supercat					
		UNC Bolts		Metric Bolts		UNC Bolts			Metric Bolts		
Dash	Size	Thread	Length	Thread	Length	Thread	Length Code 62	Length Supercat	Thread	Length Code 62	Length Supercat
08	1/2"	5/16"-18	1¼"	M8 x 1.25	35	5/16"-18	1¼"	-	M8 x 1.25	35	-
10 *	5/8"	5/16"-18	1¼"	M8 x 1.25	35	-	-	-	-	-	-
12	3/4"	3/8"-16	1¼"	M10 x 1.5	35	3/8"-16	1½"	1¾"	M10 x 1.5	40	45
16	1"	3/8"-16	1¼"	M10 x 1.5	35	7/16"-14	1¾"	1¾"	M12 x 1.75	45	45
20	1.1/4"	7/16"-14	1½"	M10 x 1.5	40	½"-13	1¾"	2"	M14 x 2*	45	50
24	1.1/2"	½"-13	1½"	M12 x 1.75	45	5/8"-11	2¼"	2½"	M16 x 2	60	60
32	2"	½"-13	1½"	M12 x 1.75	45	¾"-10	2¾"	-	M20 x 2.5	70	-
40	2.1/2"	½"-13	1¾"	M12 x 1.75	45	-	-	-	-	-	-
48	3"	5/8"-11	1¾"	M16 x 2	45	-	-	-	-	-	-

Supercat Flange Clamps (not available from PIRTEK) use the same bolt spacings as Code 62 but the bolts are generally longer to accommodate the 14.2 mm flange thickness *NOTE: For new designs thread is M12 x 1.75

Thread Identification

'O' RING FACE SEAL MALE



Applicable Standards
Thread Form: SAE J1453
Materials Available: S12L14 (Mild Steel) GB12361-12362 Part II (Drop Forged)

Dash Size	Nominal Tube Size (ins)	Nominal Thread Size & Pich	Correct Torque (ft/lbf)	Max Work Press. (psi) SAE J1453	Thread OD 'D' on Diagram	
					ins	mm
4	1/4"	9/16 - 18	11	413	0.56	14.22
6	3/8"	11/16- 16	18	413	0.69	17.52
8	1/2"	13/16 - 16	33	413	0.82	20.82
10	5/8"	7/8	48	413	1.00	25.40
12	3/4"	1. 3/16 - 12	70	413	1.19	30.22
16	1"	1. 7/16 - 12	96	413	1.44	36.57
20	1 1/4"	1. 11/16 - 12	140	275	1.69	42.92
24	1 1/2"	2 - 12	162	275	2.00	50.80

Applicable Standards
Thread Form: Metric
Standard: Unknown Chinese Standard

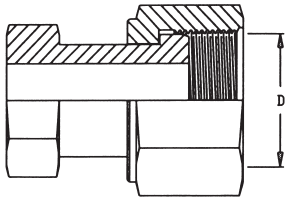
A metric threaded design similar to ORFS is increasingly being encountered on equipment of Chinese origin. The pressure rating is linked to the designed working pressure of the hose that it accompanies (Sizes and pressures marked with * refer to spiral hoses. All others relate to a 3-braid design and should be considered the maximum achievable).

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.

Dash Size	Nominal Tube Size (ins)	Nominal Thread Size & Pich	Correct Torque (ft/lbf)	Max. Press. (psi)		
14	1/4"	M14 x 1.5		9427	-	14
16	5/16"	M16 x 1.5		7687	-	16
18	3/8"	M18 x 1.5		7687	-	18
20*	1/4"*	M20 x 1.5		14503*	-	20
22	1/2"	M22 x 1.5		5511	-	22
24*	3/8"	M24 x 1.5		10152	-	24
27*	5/8", 1/2"*	M27 x 1.5		4931, 8702*	-	27
30	3/4"	M30 x 1.5		4351	-	30
33*	5/8"*	M33 x 2		7977*	-	33
36*	3/4"*	M36 x 2		6671*	-	36
39	1"	M39 x 2		3045	-	39
45*	1 1/4", 1"*	M45 x 2		1740, 5076*	-	45
52*	1 1/2", 1 1/4*	M52 x 2		1595, 4641*	-	52
64*	2"*	M64 x 2		1305, 3625*	-	64
70*	2"*	M70 x 2		2900*	-	70

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

'O' RING FACE SEAL FEMALE



Applicable Standards
Thread Form: SAE J1453
Materials Available: S12L14 (Mild Steel) GB12361-12362 Part II (Drop Forged)

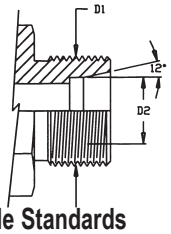
Dash Size	Nominal Tube Size (ins)	Nominal Thread Size & Pich	Correct Torque (ft/lbf)	Max Work Press. (psi) SAE J1453	Thread ID 'D' on Diagram	
					ins	mm
4	1/4"	9/16 - 18	11	6091	0.51	12.95
6	3/8"	11/16 - 16	18	6091	0.63	16
8	1/2"	13/16 - 16	33	6091	0.75	19.05
10	5/8"	1 - 14	48	6091	0.93	23.62
12	3/4"	1. 3/16 - 12	70	6091	1.11	28.19
16	1"	1. 7/16 - 12	96	6091	1.36	34.54
20	1. 1/4"	1. 11/16 - 12	140	4061	1.61	40.89
24	1. 1/2"	2 - 12	162	4061	1.92	48.76

See also Chinese Metric Form documented above	As for the data given above. PIRTEK currently cater only for M18, M22 and M24 sizes

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

Thread Identification

GAZ FRENCH METRIC MALE



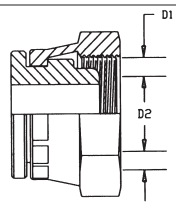
Applicable Standards

Thread Form:

Materials Available: S12L14 (Mild Steel)

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 MALE



Applicable Standards

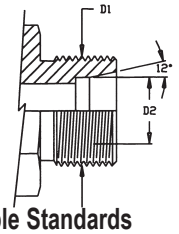
Thread Form:

Materials Available: S12L14 (Mild Steel)

Dash Size	Nominal Tube Size 'D2" mm	Nominal Thread Size & Pitch)	Thread OD '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



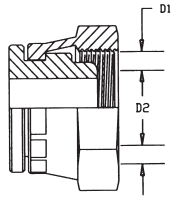
Applicable Standards

Thread Form:

Materials Available: S12L14 (Mild Steel)

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



Applicable Standards

Thread Form:

Materials Available: S12L14 (Mild Steel)

Dash Size	Nominal Tube Size 'D2" mm	Nominal Thread Size & Pitch	Thread OD '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