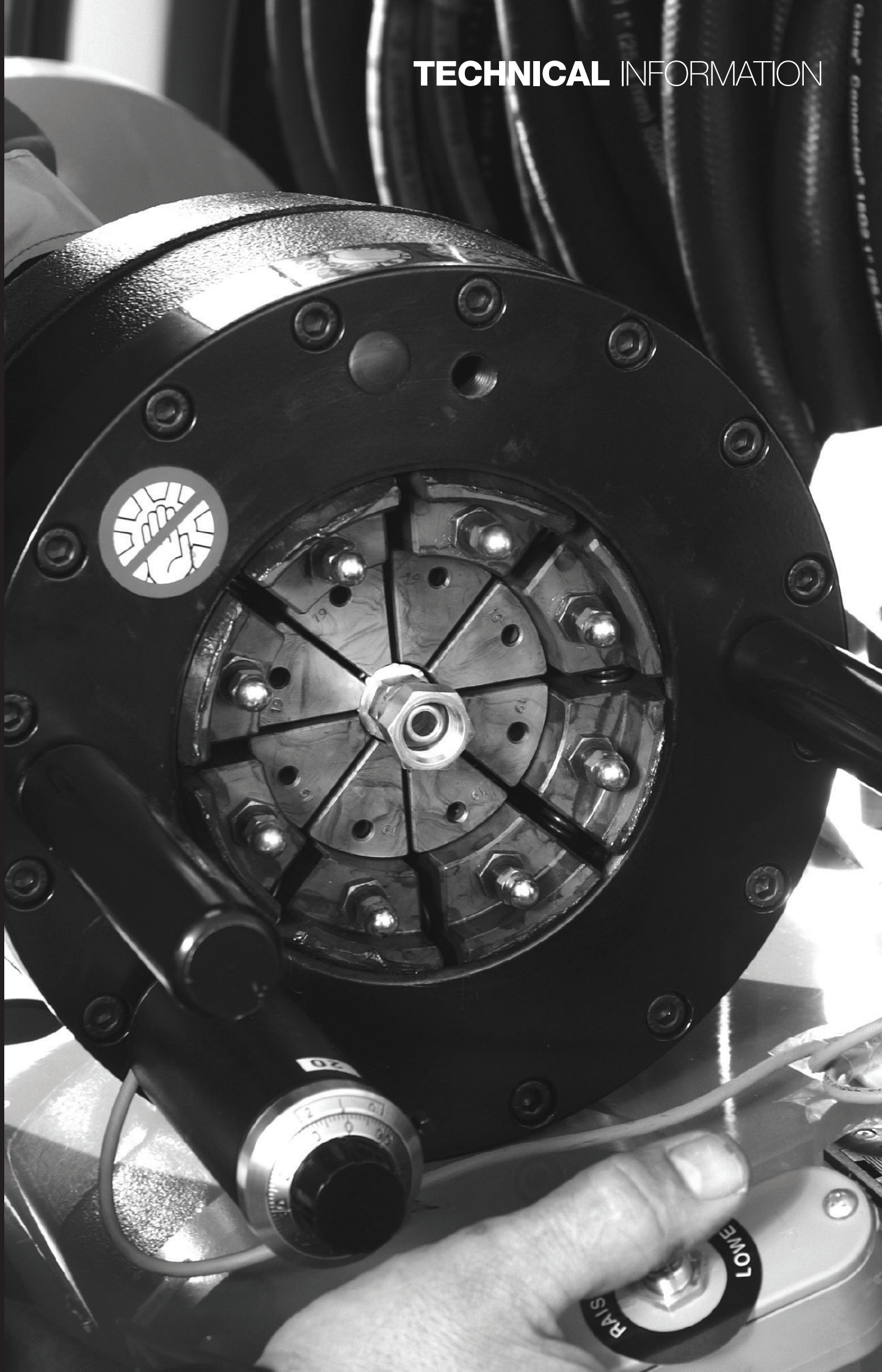
Hydraulink Branded Hose

TECHNICAL INFORMATION



SECTION 1

Hydraulink Hose and Fittings

PRODUCT SELECTION

GENERAL INFORMATION

An essential step in ensuring that a hydraulic system is safe and delivers optimum performance and service life is selecting the correct fluid conveying components.

Although a lot of the work undertaken in this industry is the replacement of existing components with a duplicate it is still good practice to check the product against the application especially if the service life of the product to be replaced was not acceptable or when fault finding on an existing system.

In some cases a problem with a hose assembly or other fluid conveying products can point to an underlying problem with the system itself or possibly the products have been incorrectly specified originally.

INFORMATION - HOSE

HOSE SELECTION & SERVICE LIFE RECOMMENDATIONS

Hydraulic hose (and hose assemblies) have a finite life span that is dependent upon the actual operating conditions the assembly is subjected to. An effective way to remember hose selection criteria is to remember the word STAMPED. STAMPED is an acronym for the following:

S = Size
T = Temperature
A = Application
M = Medium or Media
P = Pressure
E = Ends
D = Delivery

1. Size - Hose Internal Diameter can be determined using the Nomographic Chart found in this section. The correct hose I.D. must be selected for the flow required. Too small an I.D. for a given volume will result in pressure drop, heat generation, fluid turbulence and possible internal tube damage. If in doubt, select the next size up.

2. Temperature. Hose selection is determined by two variables of temperature; the ambient (external) temperature and the fluid/material (internal) temperature. The hose should not be exposed to internal or external temperatures which exceed the manufacturer's stated maximum and minimum limits. Both continual and intermittent temperatures must be accommodated within the recommended limits. Extra care must be taken when specifying hoses that are routed near to (or terminate on) hot components such as engine manifolds.

3. Application. The determination of how the hydraulic hose or hose assembly will be used. Questions that may need to be answered to ensure correct hose selection could include: What is the suitable hose construction? What type of equipment is it used on? What are the end connections? Are there applicable Government or Industry standards to be satisfied? Questions that may need to be answered to ensure correct hose selection could include; What are the environmental conditions the hose will be used in? Does the hose require a special cover or armour? Are there unusual mechanical loads or excessive movement? What are the routing requirements? What are the required lengths and bend radius to satisfy those routing requirements? (Further data regarding Hose Installation Recommendation can be found in this section.)

4. Medium (or media, material) to be conveyed. Hose selection must ensure compatibility of the hose tube (liner) and outer cover with the oil, chemical or gas to be conveyed. A chemical resistance table to rubber compounds can be found in this section. Similar care to ensure compatibility should be taken when specifying end connections (hosetails and adaptors), especially those that contain o-rings.

5. Pressure. The pressure in a hydraulic system should not exceed the stated hose working pressure at any time. System pressure spikes and surges must be considered and accommodated within the stated working pressure limits. Minimum burst pressures are reference pressures, and are intended for destructive testing and design purposes only.

6. Ends. The thread portions of the hose assembly must of course, be compatible with what it is connecting to. Different thread types have different working pressures, always insure that the threaded ends selected meet or exceed the designed working pressure. Check the technical section of this catalogue for pressure ratings. Also the chemical compatibility of the end fittings must be checked as per the hose. Ensure that the ends chosen are of the type matched to the hose.

7. Delivery. When a product is actually needed is important. A decision of what product is used can need to be altered by what is available when needed. Always specify up, not down to meet a timeline. A simple change of adaptor may be all that is needed to meet a requirement.

Exposure of hose or hose assemblies to operating conditions which exceed recommended or stated limits will significantly reduce the expected service life. If in doubt, over-specify hose assemblies to ensure as much safety margin on the recommended limits as possible.

Notes;
The potential service life of products can be significantly reduced if they are constantly operating at maximum limits.
Some areas of the selection process are interrelated however the key to correct product selection is the understanding of the application and what is required of the product.

THREAD IDENTIFICATION

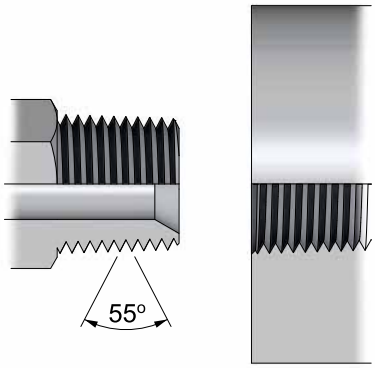
B.S.P.T. - BRITISH STANDARD PIPE TAPER

Taper: 1 in 16 by diameter

Thread Angle: 55°

The BSPT (British Standard Pipe Taper) male is intended to mate with the BSPT female only. Although the taper male will screw into BSP Parallel fixed female sockets, this is not recommended practice where avoidable as a reliable seal cannot be guaranteed.

While many BSPT males are coned 30° and will mate with BSP Parallel swivel nut females, this is not recommended practice as the taper form can deform the parallel thread and reduce the integrity of the seal.



Thread Size & TPI	Male Thread O.D. BSPT*	Female Thread I.D. BSPT
1/8-28	9.7	8.5
1/4-19	13.1	11.4
3/8-19	16.6	14.9
1/2-14	20.9	18.6
5/8-14	22.9	20.6
3/4-14	26.4	24.1
1-11	33.2	30.2
1.1/4-11	41.9	38.9
1.1/2-11	47.8	44.8
2-11	59.6	56.6

**Basic gauge plane diameter at basic gauge depth*

B.S.P.P. - BRITISH STANDARD PIPE PARALLEL

Thread Angle: 55°

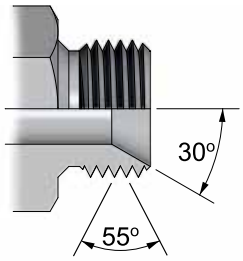
The British Standard Pipe Parallel (BSPP) male is typically coned 30° and will mate with either a BSPP swivel nut female or a BSPP female port.

BSPP female ports are normally spot faced, sealing is by either a soft metal washer, a bonded seal or a captive “O” ring.

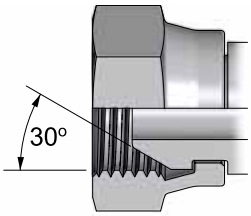
In some cases,the port is chamfered to accept an “O” ring seal. (Similar to the U.N.O. style).

Thread Size & TPI	Male Thread O.D. BSPP	Female Thread I.D. BSPP	Torque Settings BSPP nuts
1/8-28	9.7	8.5	12 Nm
1/4-19	13.1	11.4	26 Nm
3/8-19	16.6	14.9	47 Nm
1/2-14	20.9	18.6	79 Nm
5/8-14	22.9	20.6	104 Nm
3/4-14	26.4	24.1	128 Nm
1-11	33.2	30.2	160 Nm
1.1/4-11	41.9	38.9	200 Nm
1.1/2-11	47.8	44.8	270 Nm
2-11	59.6	56.6	350 Nm

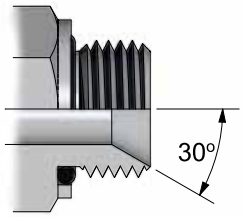
N.B. Torque values are nominal and supplied as a guide only.



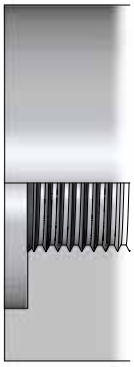
BSPP male



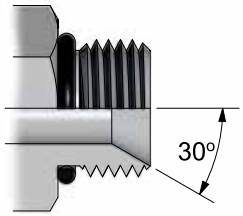
BSPP swivel nut female



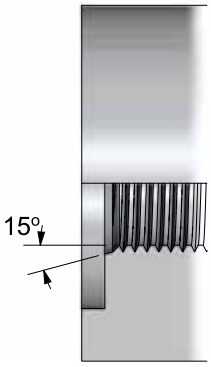
BSPP male with captive o-ring seal



BSPP female port (spot-faced)



BSPP male with o-ring seal



BSPP female port (chamfered)

N.P.T. - NATIONAL PIPE THREAD

N.P.T.F.; National Pipe Taper Fuel

N.P.S.M.; National Pipe Straight Mechanical

N.P.S.F.; National Pipe Straight Fuel

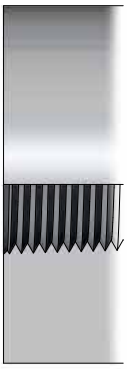
Taper: 1 in 16 by diameter.

Thread Angle: 60°

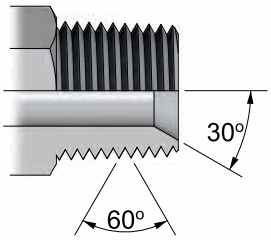
The National Pipe Taper Fuel (NPTF) male is coned 30° and will mate with the NPTF female port (taper), the National Pipe Straight Mechanical (NPSM) female (swivel nut female with 30° sealing cone), or the National Pipe Straight Fuel (NPSF) female port (parallel).

As NPTF is a “dryseal” thread, no sealing medium is required. However a sealing medium can be used to prevent thread galling.

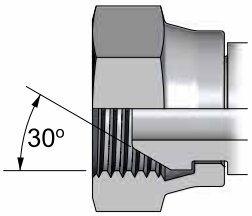
Thread Size & TPI	Male Thread O.D.	Female Thread I.D.	
	NPTF	NPTF	NPSF/SM
1/8-27	10.0	8.6	8.7
1/4-18	13.3	11.2	11.4
3/8-18	16.7	14.7	14.9
1/2-14	20.8	18.2	18.8
3/4-14	26.1	23.5	23.9
1-11.1/2	32.7	29.5	30.2
1.1/4-11.1/2	41.4	38.3	39.1
1.1/2-11.1/2	47.5	44.4	45
2-11.1/2	59.3	56.2	57



NPTF female port (taper)



NPTF male (taper)



NPSM swivel nut female

NPSF female port (parallel)

J.I.C / U.N. O-RING THREAD

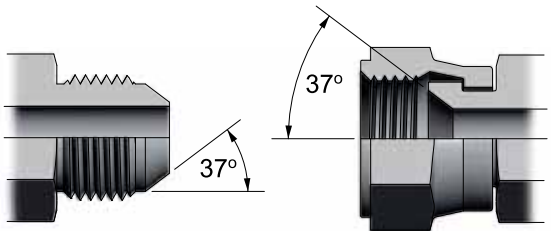
J.I.C. and U.N.“O”-Ring threads are both of the Unified National Form.

J.I.C. refers to the 37° flare type sealing face. The J.I.C. female is usually a swivel nut, but can also be a fixed socket (port) with a 37° sealing face in the base of the socket.

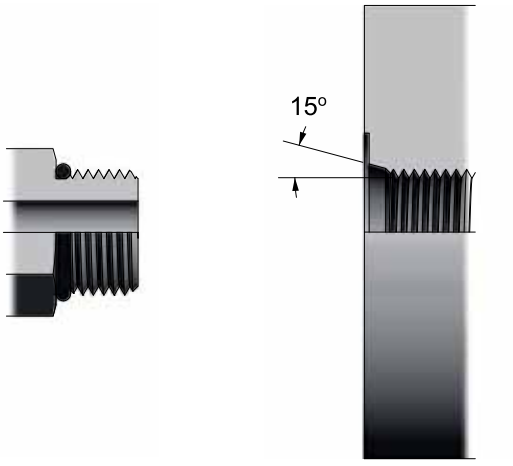
U.N.“O”-Ring refers to the thread type and “O”-Ring for sealing. The female U.N.O port has a chamfer to accept the o-ring.

Thread Size & TPI	Female Thread I.D.	Tube O.D.	Torque Settings JIC	Torque Settings UN"O"
7/16 x 20 UNF	9.8	1/4"	14 Nm	21 Nm
1/2 x 20 UNF	11.5	5/16"	19 Nm	25 Nm
9/16 x 18 UNF	13.0	3/8"	30 Nm	34 Nm
3/4 x 16 UNF	17.4	1/2"	50 Nm	72 Nm
7/8 x 14 UNF	20.3	5/8"	80 Nm	100 Nm
1 1/16 x 12 UN	24.8	3/4"	130 Nm	176 Nm
1 3/16 x 12 UN	28.2	7/8"	140 Nm	220 Nm
1 5/16 x 12 UN	31.2	1"	156 Nm	290 Nm
1 5/8 x 12 UN	39.2	1.1/4"	188 Nm	350 Nm
1 7/8 x 12 UN	45.5	1.1/2"	268 Nm	460 Nm
2 1/2 x 12 UN	61.5	2"	346 Nm	540 Nm

N.B. Torque values are nominal and supplied as a guide only.



JIC male **JIC swivel nut female**

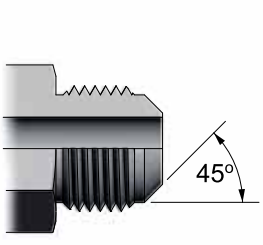


UNO male **UNO female port (chamfered)**

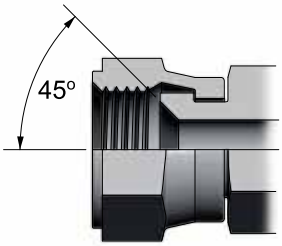
THREAD IDENTIFICATION

S.A.E. - SOCIETY OF AUTOMOTIVE ENGINEERS

This system utilises the U.N. thread series and a 45° flare sealing face. Primarily used in the automotive and refrigeration industries.



SAE male



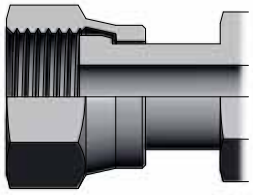
SAE swivel nut female

Thread Size & TPI	Tube O.D.	Female Thread I.D.
7/16-20	1/4"	9.8
1/2-20	5/16"	11.4
5/8-18	3/8"	14.3
11/16-16	7/16"	16
3/4-16	1/ 2"	17.5
7/8-14	5/8"	20.5
1.1/16-14	3/4"	24.8
1.1/4-12	7/8"	30.1
1.3/8-12	1"	33.2

O.R.F.S. - O-RING FACE SEAL

This system uses an “O”-Ring for sealing. The “O”-Ring is housed in the face of the male and is compressed by the face of the female on connection. Connecting threads are U.N. form.

ORFS male



ORFS swivel nut female

Thread Size & TPI	Female Thread I.D.	Tube O.D.	"O"-ring size	Torque Settings *
9/16-18 UNF	12.8	1/4"	5/16x1/16	14-16 Nm
11/16-16 UN	16.0	3/8"	3/8x1/16	24-27 Nm
13/16-16 UN	19.1	1/2"	1/2x1/16	43-47 Nm
1-14 UN	23.5	5/8"	5/8x1/16	60-69 Nm
1.3/16-12UN	26.1	3/4"	3/4x1/16	90-95 Nm
1.7/16-12 UN	34.2	1"	15/16x1/16	125-135 Nm
1.11/16-12 UN	40.6	1.1/4"	1.3/16x1/16	170-190 Nm
2-12 UN	48.0	1.1/2"	1.1/2x1/16	200-225 Nm

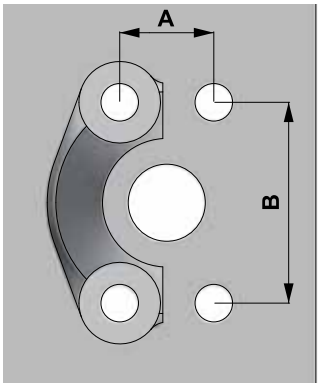
N.B. Torque values are nominal and supplied as a guide only.

S.A.E. O-RING FLANGES (SAE - J518)

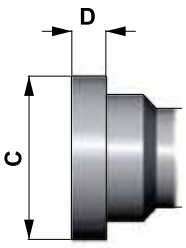
These connections utilise an “O”-Ring for sealing and are widely used for connecting to pump and motor parts as well as end terminations for pipe runs.

The “O”-Ring is housed in the flange head face and seals on a flat face female port, the flange is held in place by two clamp halves (or a one piece clamp) which are secured by four bolts.

SAE flanges are available in two pressure classes: **Standard Series, Code 61**, which goes to 5000 psi (dependent on size), and the **High Pressure Series, Code 62**, which is rated to 6000 psi for all sizes.



SAE flange clamp / port bolt spacing



SAE flange head dimensions

Nominal Flange Size	A (mm)		B (mm)		C (mm)		D (mm)	
	Code 61	Code 62	Code 61	Code 62	Code 61	Code 62	Code 61	Code 62
1/2	17.48	18.24	38.1	40.49	30.18	31.75	6.75	7.75
***5/8**	19.8	-	42.90	–	34.0	–	6.73	–
3/4	22.23	23.80	47.63	50.80	38.10	41.28	6.73	8.76
1	26.19	27.76	52.37	57.15	44.45	47.63	8.0	9.53
1.1/4	30.18	31.75	58.72	66.68	50.80	53.98	8.0	10.29
1.1/2	35.71	36.50	69.85	79.38	60.33	63.50	8.0	12.57
2	42.88	44.45	77.77	96.82	71.42	79.38	9.53	12.57

Nominal Flange Size	Pressure Rating		"O"-ring size		UNC Bolt size		Bolt torque	
	Code 61	Code 62	Code 61 and 62	AS568A number	Code 61	Code 62	Code 61	Code 62
1/2	5000 psi	6000 psi	3/4x1/8	210	5/16x1.1/4	5/16x1.1/4	20-25 Nm	20-25 Nm
3/4	5000 psi	6000 psi	1x1/8	214	3/8x1.1/4	3/8x1.1/2	28-40 Nm	34-45 Nm
1	5000 psi	6000 psi	1.5/16x1/8	219	3/8x1.1/4	7/16x1.3/4	37-48 Nm	56-68 Nm
1.1/4	4000 psi	6000 psi	1.1/2x1/8	222	7/16x1.1/2	1/2x1.3/4	48-62 Nm	85-102 Nm
1.1/2	3000 psi	6000 psi	1.7/8x1/8	225	1/2x1.1/2	5/8x2.1/4	62-79 Nm	158-181 Nm
2	3000 psi	6000 psi	2.1/4x1/8	228	1/2x1.1/2	3/4x2.3/4	73-90 Nm	271-294 Nm

**The 5/8* size flange is not part of the SAE`standard. It is included in the J.I.S. standards and is used by Komatsu and other O.E.M's.*

N.B. Torque values are nominal and supplied as a guide only

Caterpillar flanges used on XT3 hose are the same as the SAE Code 61, XT5 flanges have the same diameter as the SAE Code 62 but are thicker in the flange head.

French Gaz (Poclain) flanges are completely different to, and will not interchange with the SAE flanges.

J.I.S. - JAPANESE INDUSTRIAL STANDARDS

Japanese Industrial Standards (J.I.S.) incorporate B.S.P. and metric threads as well as flanges in their connection standards.

Taper Threads:

Type R; BSPT Male *(Identical to BSP standard)*

Parallel Threads:

Type G; BSPP Male *(Identical to BSP standard)*

Type C; BSPP Swivel Nut Female *(Identical to BSP standard - for thread data please refer to BSPP section)*

Type F; BSPP Swivel Nut Female, 30° Flare Seat

Type M; Metric, Male, 30° Cone

Type MF; Metric, Swivel Nut Female, 30° Flare Seat

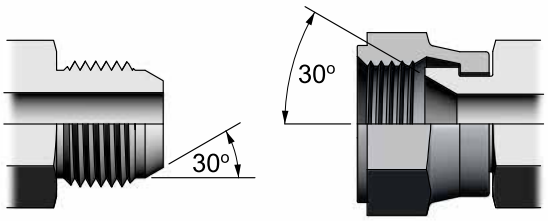
"O"-Ring Flanges:

Type I; Equivalent to Code 61 *(Identical to SAE standard)*

Type II; Equivalent to Code 62 *(Identical to SAE standard)*

THREAD SPECIFICATIONS			
Metric Threads (J.I.S)		Komatsu Threads (Metric)	
14-1.5*	12.5	**14-1.5***	12.5
18-1.5*	16.5	**18-1.5***	16.5
22-1.5*	20.5	**22-1.5***	20.5
27-2.0	25	**24-1.5**	22.5
33-2.0	31	**30-1.5**	28.5
42-2.0	40	**33-1.5**	31.5
50-2.0	48	**36-1.5**	34.5
60-2.0	58	**42-1.5**	40.5

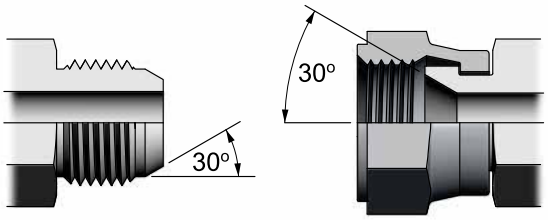
** denotes interchange sizes between JIS and Komatsu.*



Type F JIS male

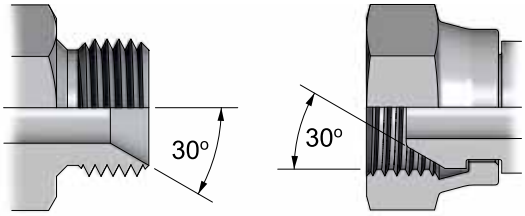
For thread data please refer to BSPP section

Type F JIS swivel nut female



Type MF JIS male

Type MF JIS swivel nut female



Type M JIS male

Type M JIS swivel nut female

D.I.N. METRICS 24° CONE SYSTEM

The D.I.N. System allows for the connection of hose assembies and tube in three main pressure series:

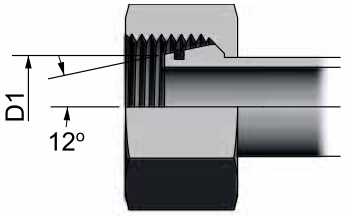
Series LL;	Extra Light, up to 100 bar
Series L;	Light up to 250 bar
Series S;	Heavy up to 640 bar

The pressure ranges are determined by the tube O.D. and the thread size e.g. a 12mm light coupling has an 18mm thread O.D. whereas a 12mm heavy coupling has a 20mm O.D. thread.

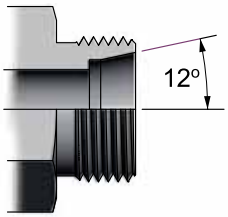
N.B: Rated coupling pressures are subject to the design pressures of the tube or hose being used.

Tubing is connected to the D.I.N. Male by the use of a cutting ring and nut. Hose assemblies can be connected by swivel nut females having either a spherical seal, 24° cone seal (can be fitted with “O”-Ring), or a standpipe with cuttting ring and nut. Hose can also be connected directly to tube by use of a hose tail with the D.I.N. Male form

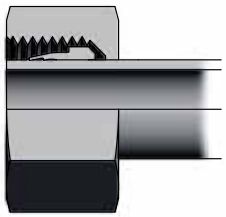
The male form will accept all three female styles shown (right).



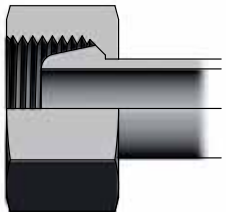
DIN 24° cone female with o-ring



DIN 24° cone male



DIN cutting ring and nut on tube



DIN female swivel nut with spherical seat

THREAD SPECIFICATIONS LIGHT (L) SERIES			
Thread O.D. & Pitch	Female Thread I.D.	Diameter D1 (mm)	Tube O.D.(mm)
M12-1.5	10.5	7.2	6
M14-1.5	12.5	9.2	8
M16-1.5	14.5	11.6	10
M18-1.5	16.5	13.8	12
M22-1.5	20.5	16.8	15
M26-1.5	24.5	19.8	18
M30-2.0	28	23.8	22
M36-2.0	34	29.8	28
M45-2.0	43	37.2	35
M52-2.0	50	44.2	42

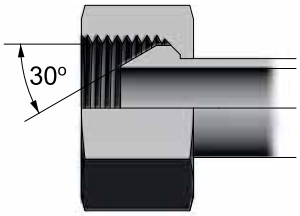
THREAD SPECIFICATIONS HEAVY (S) SERIES			
Thread O.D. & Pitch	Female Thread I.D.	Diameter D1 (mm)	Tube O.D.(mm)
M14-1.5	12.5	7.2	6
M16-1.5	14.5	9.2	8
M18-1.5	16.5	11.6	10
M20-1.5	18.5	13.8	12
M22-1.5	20.5	15.8	14
M24-1.5	22.5	17.8	16
M30-2.0	28	22	20
M36-2.0	34	27	25
M42-2.0	40	32	30
M52-2.0	50	40	38

** N.B. Diameter D1 is nominal and may vary between manufacturers.*

D.I.N. METRICS 60° CONE SYSTEM

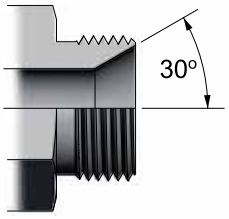
This series utilises a 60° cone seating angle and is used for the connection of hose assemblies and tube. It differs from the 24° series in that the threads are predominately 1.5mm pitch and there is no light or heavy pressure ranges.

The D.I.N. 60° male will accept the universal (spherical seat) female, a 60° coned female and tube fitted with a cutting ring and nut.

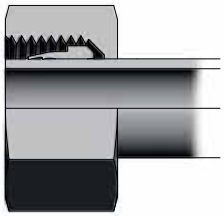


DIN 60° cone female

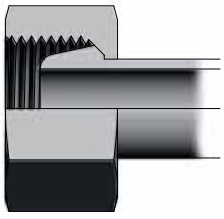
THREAD SPECIFICATIONS		
Thread O.D. & Pitch	Female Thread I.D.	Tube O.D.(mm)
M10-1.0	9.0	5
M12-1.5	10.5	6
M14-1.5	12.5	8
M16-1.5	14.5	10
M18-1.5	16.5	12
M22-1.5	20.5	15
M26-1.5	24.5	18
M30-1.5	28.5	22
M38-1.5	36.5	28
M45-1.5	43.5	35
M52-2.0	56.5	42



DIN 60° cone male



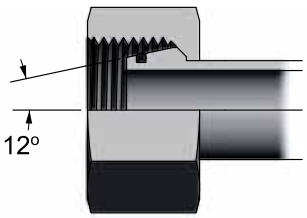
DIN cutiing ring and nut on tube



DIN female swivel nut with spherical seat

I.S.O. METRICS (INTERNATIONAL STANDARDS ORGANISATION)

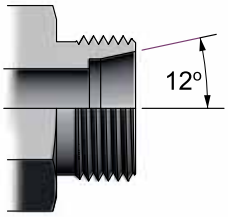
The I.S.O. series of couplings is similar to the D.I.N. light and heavy in function. The male has a 24° included angle sealing cone and a recessed counter bore for locating the tube when used in conjunction with a cutting ring and nut. The male will also accept a swivel nut female with either a cone or a spherical seal.



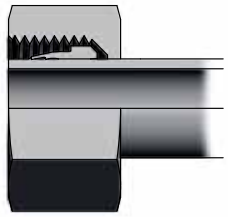
ISO (24° cone) female with o-ring

THREAD SPECIFICATIONS		
Thread O.D. & Pitch	Female Thread I.D.	Tube O.D.(mm)
M12-1.0	11.0	6
M14-1.5*	12.5	8
M16-1.5*	14.5	10
M18-1.5*	16.5	12
M20-1.5	18.5	14
M22-1.5*	20.5	15
M24-1.5**	22.5	16
M27-1.5	25.5	18
M30-1.5	28.5	22
M33-1.5	31.5	25
M36-1.5	34.5	28
M39-1.5	37.5	30
M42-1.5	40.5	32
M45-1.5	43.5	35
M48-1.5	46.5	38
M52-1.5	50.5	40

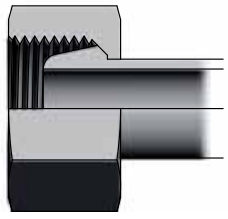
** Interchange with D.I.N. Light*
*** Interchange with D.I.N. Heavy*



ISO (24° cone) male



ISO cutting ring and nut on tube



ISO female swivel nut with spherical seat

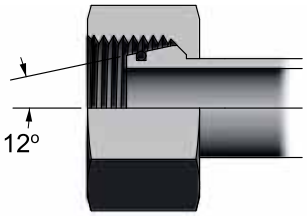
FRENCH METRICS (GAZ & MILLIMETRIQUE SERIES)

The series are similar to the D.I.N. 24° type where the male has a 24° included angle sealing cone and a recessed counterbore for locating the tube.

The male will accept a cutting ring and nut for use with tube or a swivel nut female with either a cone or spherical seal.

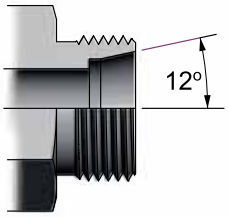
The Gaz and Millimetrique series are identical in all respects except for the O.D. of the tube:

- Gaz series uses fractional number O.D. metric tubing.
- Millimetrique series uses whole number O.D. metric tubing.

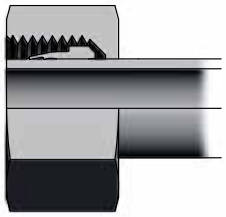


French 24° cone female with o-ring

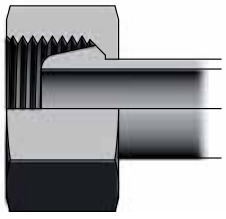
THREAD SPECIFICATIONS LIGHT (L) SERIES			
Thread O.D. & Pitch	Female Thread I.D.	Diameter GAZ	Diameter Millimetrique
M12-1.0	11.0	-	6
M14-1.5	12.5	-	8
M16-1.5	14.5	-	10
M18-1.5	16.5	-	12
M20-1.5	18.5	13.25	14
M22-1.5	20.5	-	15
M24-1.5	22.5	16.75	16
M27-1.5	25.5	-	18
M30-1.5	28.5	21.25	22
M33-1.5	31.5	-	25
M36-1.5	34.5	26.75	28
M39-1.5	37.5	-	30
M42-1.5	40.5	-	32
M45-1.5	43.5	33.5	35
M48-1.5	46.5	-	38
M52-1.5	50.5	42.25	40
M54-2.0	52.0	-	45
M58-2.0	56.0	48.25	-



French 24° cone male



Cutting ring and nut on tube

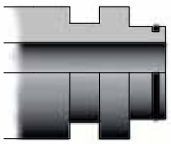


French female swivel nut with spherical seat

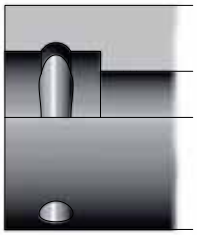
STAPLE-LOK COUPLINGS

Originally designed in Germany for underground mining equipment, the Staple-lok requires no spanners for connection or disconnection. The male and female are pushed together and held with a retaining staple or “U” clip.

Sealing is achieved by the captive “O”-Ring located on the male spigot. The female can either be fixed or swivel type. The coupling is not designed to swivel under pressure.

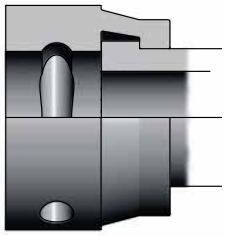


Staple-lok male



Staple-lok fixed female

THREAD SPECIFICATIONS					
Coupling Dash Size	Imperial Size	Male O.D. inch	Male O.D. mm	Female I.D. inch	Female I.D. mm
-4	1/4	0.58	14.8	.59	15.0
-6	3/8	0.78	19.8	.79	20.0
-8	1/2	0.94	23.9	.95	24.1
-12	3/4	1.13	28.8	1.14	29.0
-16	1	1.53	38.9	1.54	39.1
-20	1.1/4	1.80	45.7	1.81	46.0
-24	1.1/2	2.16	54.9	2.17	55.1
-32	2	2.52	64.0	2.53	64.3



Staple-lok swivel female

Staple-lok staple

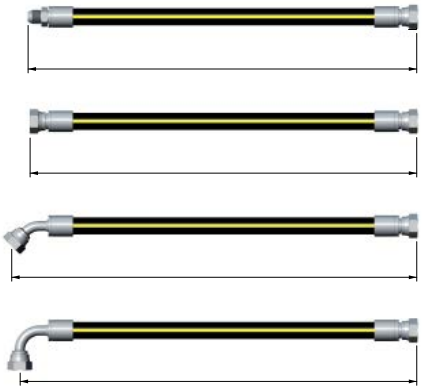
Hydraulink
Hose and Fittings

HOSE ASSEMBLY MEASUREMENT

STRAIGHT HOSE ASSEMBLY LENGTH

Overall hose assembly lengths are determined by measuring the centreline length between the coupling end faces for straight couplings, or through the sealing face centreline for angled couplings (examples to right).

Sufficient length allowance should be made to compensate for hose contraction and expansion under operating procedures.



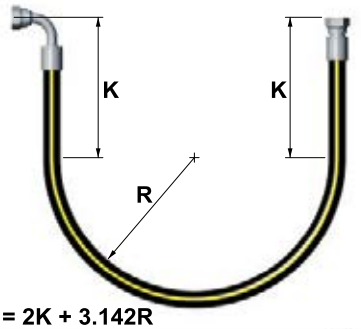
BENT HOSE ASSEMBLY LENGTH

For installations that require a 180° bend in the hose assembly, the overall length can be calculated as follows:

Static Installations

To avoid localised concentration of bending strain on the hose couplings, a free distance (K) of hose should be designed into the length of each assembly. Distance “K” includes length of coupling and adaptor (if used). Dimension “R” should not be less than the manufacturer’s recommended bend radius for the hose used. Refer to chart below for “K” dimensions of hoses with I.D. from 3/16” to 2”.

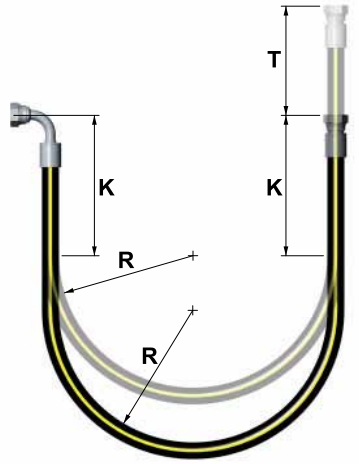
Hose I.D.	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	1.1/4	1.1/2	2
K (mm)	110	130	130	160	180	210	210	260	260	260	310



Length = 2K + 3.142R

Dynamic Installations

When a hose assembly is subjected to relative motion between the two end couplings, additional hose length is required to accomodate the travel distance. In the diagram (right) “T” represents the amount of travel.



Length = 2K + 3.142R + T

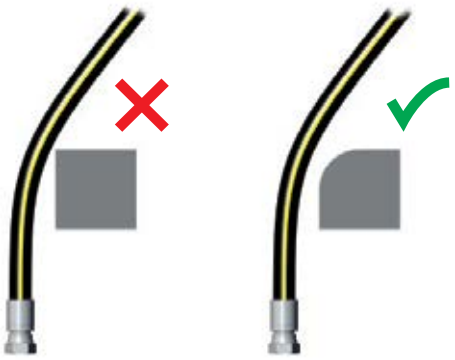
Off-Set Angle Measurement

Place hose assembly in line of sight position with coupling furthest away facing upwards. Determine off-set angle by comparing relative position of closest coupling to the far coupling in a clockwise direction.

HOSE INSTALLATION RECOMMENDATIONS

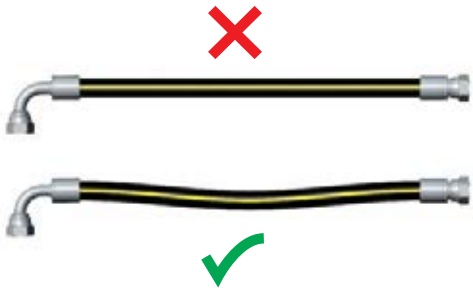
1. Hose Protection
Protect the hose cover from damage such as abrasion, erosion, snagging, and cutting. Where possible, route hose to reduce abrasion from hose rubbing other hose or objects that may abrade it (Fig. 1). Special abrasion-resistant hoses and hose guards are available for additional protection. Special consideration may also need to be given to hose assemblies near heat sources.

Fig. 1



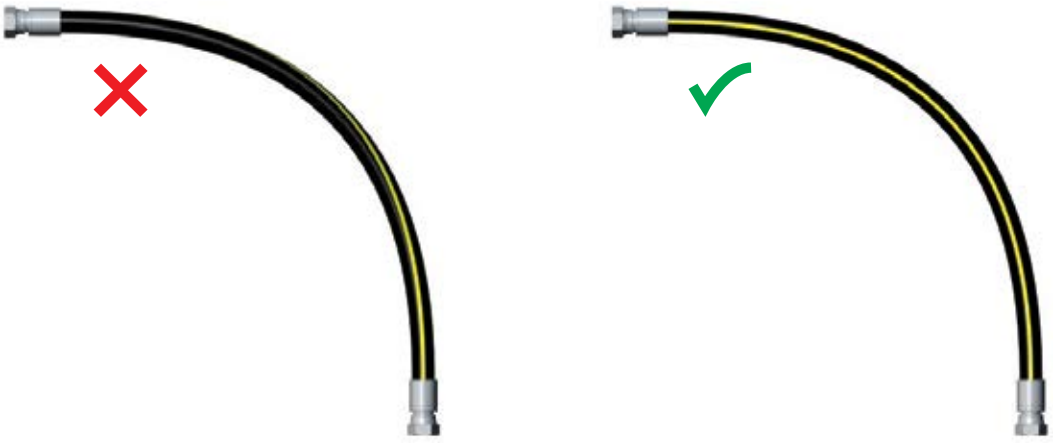
2. Hose And Machine Tolerances
Avoid tension on hose assemblies and adaptors. Design hose to allow for changes in length due to machine motion and tolerances (Fig. 2). Failure to do so may result in seal or assembly failure.

Fig. 2



3. Torsional Twist
Do not transfer torque to hose while installing. This transfer of torque can result in torsional twist, which may result in premature hose assembly failure. Use swivel type couplings or adaptors for ease of alignment as needed to prevent twisting during installation. Use the brand lay-line as a guide to ensure the hose is not pre-loaded with torsional twist when installed (Fig. 3).

Fig. 3



4. Minimum Bend Radius
The minimum bend radius for hose supplied by Hydraulink is detailed in this catalogue. Routing at less than minimum bend radius is not recommended and may reduce hose life.

Prevent sharp bending at the hose/fitting juncture (Fig. 4a). Unnecessary stress at this point may result in leaking, hose rupturing, or the hose assembly blowing apart.

Stress at this point can be minimised by ensuring adequate hose length (Fig. 4b), or by use of angled adaptors and couplings (Fig 4c).

Fig. 4a

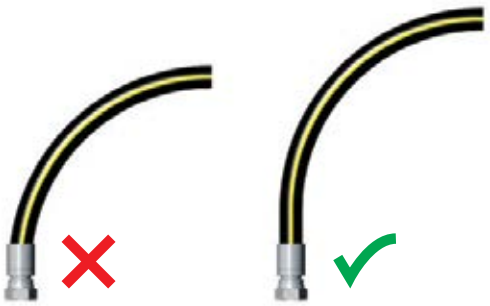


Fig. 4b

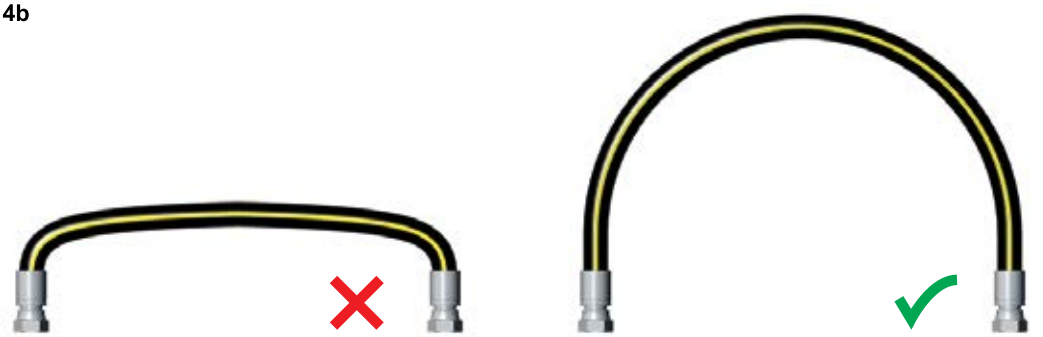


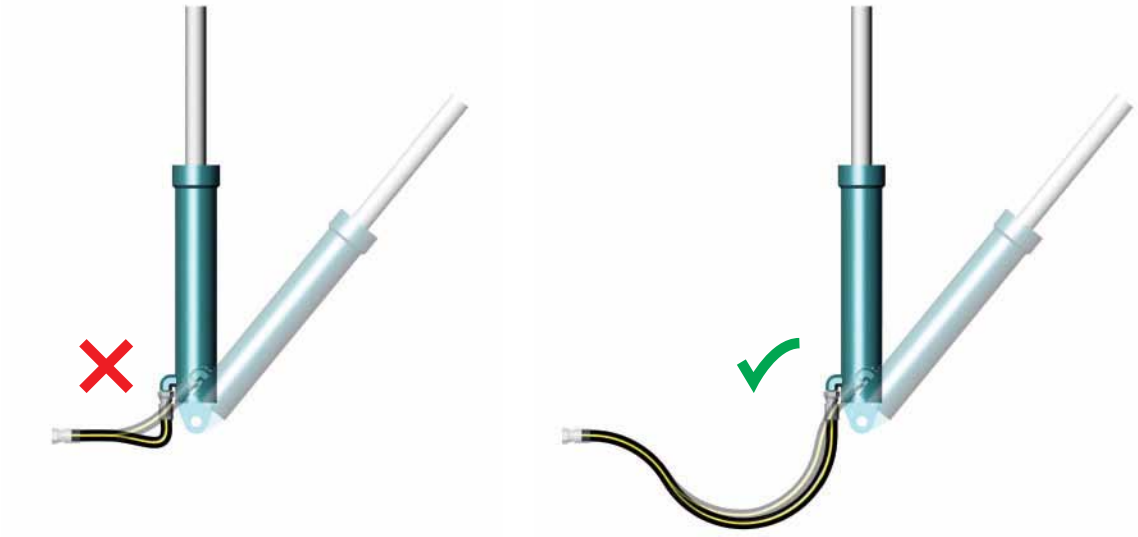
Fig. 4c

5. Hose Length Change
Hydraulic hose can expand longitudinally when pressurised, and this hose length change must be considered when specifying or installing hose assemblies (Fig. 5) When clamping hose lengths, always place clamps to avoid stressing the fitting end.

Fig. 5

6. Relative Movement
When specifying or installing hoses that have movement relative to each other, provide adequate hose length to absorb the required movement and prevent bends occuring that are smaller than the minimum bend radius (Fig. 6a).

Fig. 6a



HYDRAULINK BRANDED HOSES

SECTION 2

HYDRAULINK BRANDED HOSE

GENERAL INFORMATION

Hydraulink has established itself as a proven hydraulic hose & fitting specialist for over 70 years. With the selection of braided and multi spiral hoses on offer, the Hydraulink range of hoses will satisfy all of your needs.

The Super Tuff “ST” range of braided hoses come standard with flame and abrasion resistant features – ideal for use in harsh and adverse environments.

For general pressure-wash applications up to 400 bar, the Hydraulink range of Jet Wash hoses are designed to be easier to handle and use due to their light, flexible and compact design.

All Hydraulink branded hoses are easily identifiable for fast fix and replacement, and are readily available across our nationwide network of service centres and mobile service vans.

Brand Name — Part Number

	Range	Construction	Constant Pressure	MSHA (Flame Resist)	HARC Abrasion	Compact
Braided	H1T	1 Wire		✓		
	H2T	2 Wire		✓		
XSPIRAL	HX4K	Multi Spiral	4100psi	✓		
	HX5K	Multi Spiral	5100psi	✓		
	HX6K	Multi Spiral	6100psi	✓		
XSPIRAL Enduro ST	HX4K-ST	Multi Spiral	4100psi	✓	✓	
	HX6K-ST	Multi Spiral	6100psi	✓	✓	
ST SuperTuff	H17	1 & 2 Wire	3000psi	✓	✓	✓
	H19	2 Wire	4100psi	✓	✓	
	H16	2 Wire		✓	✓	✓
Jet Wash	HJW250	1 Wire	250bar			
	HJW400	2 Wire	400bar			

HOSE SELECTION & SERVICE LIFE RECOMMENDATIONS

Extracts from SAE J1273 SEP2014: Recommended Practices for Hydraulic Hose Assemblies

1. Scope—SAE J1273 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.

5. Hose Selection and Routing—A wide variety of interacting factors influence hose service life and the ability of each fluid-power system to operate satisfactorily, and the combined effects of these factors on service life are often unpredictable. Therefore, these documents should not be construed as design standards. For applications outside the specifications in SAE J517, SAE J514, or other relevant design standards, performance of hose assemblies should be determined by appropriate testing. Carefully analyze each system. Then design routings and select hose and related components to meet the system-performance and hose-service-life requirements, and to minimize the risks of personal injury and/or property damage. Consider the following factors:

5.1 System Pressures—Excessive pressure can accelerate hose assembly failure. Analyze the steady-state pressures, and the frequency and amplitude of pressure surges, such as pulses and spikes. These are rapid and transient rises in pressure which may not be indicated on many common pressure gauges and can be identified best on high-frequency-response electronic measuring instruments.

For maximum hose service life, hose selection should be based on a system pressure, including surges, that is less than the hose maximum working pressure. Hose may be used above its maximum working pressure where reduced life expectancy is acceptable. SAE J1927 provides one method to help predict wire-reinforced hose service life for a given hydraulic application, where the surge pressure peaks vary, and/or the highest pressure peaks occur infrequently.

5.2 Suction—For suction applications, such as inlet flow to pumps, select hose to withstand both the negative and positive pressures the system imposes on the hose.

5.3 External Pressure—In certain applications, such as in autoclaves or under water, the external environmental pressures may exceed the fluid pressure inside the hose. In these applications, consider the external pressures, and if necessary, consult the manufacturers.

5.4 Temperature—Exceeding hose temperature ratings may significantly reduce hose life. Select hose so the fluid and ambient temperatures, both static and transient, fall within the hose ratings. The effects of external heat sources should not raise the temperature of the hose above its maximum op-erating temperature. Select hose, heat shields, sleeving, and other methods for these requirements, and route or shield hose to avoid hose damage from external heat sources.

HOSE SELECTION & SERVICE LIFE RECOMMENDATIONS (cont'd)

5.5 Permeation—Permeation, or effusion, is seepage of uid through the hose. Certain materials in hose construction are more permeable than others. Consider the effects of permeation when select-ing hose, especially with gaseousuids. Consult the hose and fluid manufacturers for permeability information.

5.6 Hose-Material Compatibility—Variables that can affect compatibility of system fluids with hose materials include, but are not limited to:

a. Fluid pressure
b. Temperature
c. Concentration
d. Duration of exposure

Because of permeation (see 5.5), consider compatibility of system fluids with the hose, tube, cover, reinforcement, and fittings. Consult the fluid and hose manufacturers for compatibility information.

NOTE— Many fluid/elastomer compatibility tables in manufacturers' catalogs show ratings based on fluids at 21 °C, room temperature. These ratings may change at other temperatures. Carefully read the notes on the compatibility tables, and if in doubt, consult the manufacturer.

5.7 Environment—Environmental conditions can cause hose and fitting degradation. Conditions to evaluate include, but are not limited to:

a. Ultraviolet light
b. Salt water
c. Air pollutants
d. Temperature (see 5.4)
e. Ozone
f. Chemicals
g. Electricity
h. Abrasion

If necessary, consult the manufacturers for more information.

5.8 Static-Electric Discharge—Fluid passing through hose can generate static electricity resulting in static-electric discharge. This may create sparks that can puncture hose. If this potential exists, select hose with sufficient conductivity to carry the static-electric charge to ground.

5.9 Sizing—The power transmitted by pressurized fluid varies with pressure and rate of flow. Select hose with adequate size to minimize pressure loss, and to avoid hose damage from heat generation or excessive velocity. Conduct calculations, or consult the manufacturers for sizing at flow velocities.

5.10 Unintended Uses—Hose assemblies are designed for the internal forces of conducted fluids. Do not pull hose or use it for purposes that may apply external forces for which the hose or fittings were not designed.

5.11 Specifications and Standards—When selecting hose and fittings for specific applications, refer to applicable government, industry, and manufacturer's specifications and standards.

HOSE SELECTION & SERVICE LIFE RECOMMENDATIONS (cont'd)

5.12 Unusual Applications—Applications not addressed by the manufacturer or by industry standards may require special testing prior to selecting hose.

5.13 Hose Cleanliness—The cleanliness requirements of system components, other than hose, will determine the cleanliness requirements of the application. Consult the component manufacturers' cleanliness information for all components in the system. Hose assemblies vary in cleanliness levels; therefore, specify hose assemblies with adequate cleanliness for the system.

5.14 Hose Fittings—Selection of the proper hose fittings for the hose and application is essential for proper operation and safe use of hose and related assembly equipment. Hose fittings are qualified with the hose. Therefore, select only hose fittings compatible with the hose for the applications. Improper selection of hose fittings or related assembly equipment for the application can result in injury or damage from leaks, or from hose assemblies blowing apart (see 4.2, 6.2, 6.3, and 6.4).

5.15 Vibration—Vibration can reduce hose service life. If required, conduct tests to evaluate the frequency and amplitude of system vibration. Clamps or other means may be used to reduce the effects of vibration. Consider the vibration requirements when selecting hose and predicting service life.

5.16 Hose Cover Protection—Protect the hose cover from abrasion, erosion, snagging, and cutting. Special abrasion-resistant hoses and hose guards are available for additional protection. Route hose to reduce abrasion from hose rubbing other hose or objects that may abrade it.

5.17 External Physical Abuse—Route hose to avoid:

a. Tensile loads
b. Side loads
c. Flattening
d. Thread damage
e. Kinking
f. Damage to sealing surfaces
g. Abrasion
h. Twisting

5.18 Swivel-Type Adapters—Swivel-type fittings or adapters do not transfer torque to hose while being tightened. Use these as needed to prevent twisting during installation.

5.19 Live Swivels—If two components in the system are rotating in relation to each other, live swivels may be necessary. These connectors reduce the torque transmitted to the hose.

5.20 Slings and Clamps—Use slings and clamps to support heavy or long hose and to keep it away from moving parts. Use clamps that prevent hose movement that will cause abrasion.

5.21 Minimum Bend Radius—The minimum bend radius is defined in SAE J343 and is specified in other SAE standards and hose manufacturer's product literature. Routing at less than minimum bend radius may reduce hose life. Sharp bending at the hose/fitting juncture may result in leaking, hose rupturing, or the hose assembly blowing apart (see 4.2)

5.22 Elbows and Adapters—In special cases, use elbows or adapters to relieve hose strain.

5.23 Lengths—Unnecessarily long hose can increase pressure drop and affect system performance.

HOSE SELECTION & SERVICE LIFE RECOMMENDATIONS (cont'd)

When pressurized, hose that is too short may pull loose from its fittings, or stress the fitting connections, causing premature metallic or seal failures. When establishing hose length, use the following practices:

5.23.1 MOTION ABSORPTION—Provide adequate hose length to distribute movement and prevent bends smaller than the minimum bend radius.

5.23.2 HOSE AND MACHINE TOLERANCES—Design hose to allow for changes in length due to machine motion and tolerances.

5.23.3 HOSE LENGTH CHANGE DUE TO PRESSURE—Design hose to accommodate length changes from changing pressures. Do not cross or clamp together high- and low-pressure hoses. The difference in length changes could wear the hose covers.

5.24 Hose Movement and Bending—Hose allows relative motion between system components. Analyze this motion when designing hose systems. The number of cycles per day may significantly affect hose life. Also avoid multiple planes of motion and twisting motion. Consider the motion of the hose when selecting hose and predicting service life. In applications that require hose to move or bend, use these practices:

5.24.1 BEND IN ONLY ONE PLANE TO AVOID TWISTING

5.24.2 PREVENT HOSE BENDING IN MORE THAN ONE PLANE—If hose follows a compound bend, couple it into separate segments, or clamp it into segments that flex in only one plane.

7. Hose Installation and Replacement—Use the following practices when installing hose assemblies in new systems or replacing hose assemblies in existing systems:

7.1 Pre-Installation Inspection—Before installing hose assemblies, examine:
a. Hose length and routing for compliance with original design
b. Assemblies for correct style, size, length, and visible nonconformities
c. Fitting sealing surfaces for burrs, nicks, or other damage

NOTE— When replacing hose assemblies in existing systems, verify that the replacement is of equal quality to the original assembly.

7.2 Handling During Installation—Handle hose with care during installation. Kinking hose, or bending at less than minimum bend radius may reduce hose life. Avoid sharp bending at the hose/fitting juncture (see 5.21).

7.3 Twist Angle and Orientation—Pressure applied to a twisted hose may shorten the life of the hose or loosen the connections. To avoid twisting, use the hose lay line or marking as a reference.

7.4 Securement and Protection—Install necessary restraints and protective devices. Determine that such devices do not create additional stress or wear points.

7.5 Routing—Review proper routing practices provided in Section 5 and make appropriate corrections to obtain optimum performance.

HOSE SELECTION & SERVICE LIFE RECOMMENDATIONS (cont'd)

7.6 Assembly Torque—The connection end of a hose fitting is normally threaded to obtain a tight pressure seal when attached to a port, an adapter, or another fitting. Sometimes bolts or screws provide the threaded connection. Each size and type of connection requires different torque values, and these may vary due to type of material or exterior coating.

Follow appropriate torquing instructions to obtain a proper pressure seal without over-torquing. A properly calibrated torque wrench should be used to tighten each connection, except when the manufacturer specifies tightening a specified number of hex flat turns beyond finger tight to obtain a seal.

7.7 System Checkouts—In hydraulic or other liquid systems, eliminate all air entrapment after completing the installation. Follow manufacturers' instructions to test the system for possible malfunctions and leaks.

7.7.1 TO AVOID INJURY DURING SYSTEM CHECKOUTS:

a. Do not touch any part of the system when checking for leaks (see 4.1).
b. Stay out of potentially hazardous areas while testing hose systems (see Section 4).
c. Relieve system pressure before tightening connections.

8. Maintenance Inspection—A hose and fitting maintenance program may reduce equipment downtime, maintain peak operating performance, and reduce the risk of personal injury and/or property damage. The user should design and implement a maintenance program that suits the specific application and each specific hose in that application.

8.1 Inspection Frequency—Evaluate factors such as the nature and severity of the application, past history, and manufacturers' information to establish the frequency of visual inspections and functional tests.

8.2 Visual Inspection (Hose and Fittings)—Visually inspect hose and fittings for:

a. Leaks at hose fitting or in hose
b. Damaged, cut, or abraded cover
c. Exposed reinforcement
d. Kinked, crushed, flattened, or twisted hose
e. Hard, stiff, heat cracked, or charred hose
f. Blistered, soft, degraded, or loose cover
g. Cracked, damaged, or badly corroded fittings
h. Fitting slippage on hose
i. Other signs of significant deterioration

If any of these conditions exist, evaluate the hose assemblies for correction or replacement.

8.3 Visual Inspection (All Other Components)—When visually inspecting hose and fittings, inspect for related items including:

a. Leaking ports
b. Damaged or missing hose clamps, guards, or shields
c. Excessive dirt and debris around hose
d. System fluid: level, type, contamination, condition, and air entrainment

If any of these are found, address them appropriately.

HOSE SELECTION & SERVICE LIFE RECOMMENDATIONS (cont'd)

8.4 Functional Test—Functional tests determine if systems with hose are leak free and operating properly. Carry out functional tests per information from equipment manufacturers.

9. Hose Storage—Age control and the manner of storage can affect hose life. Use the following practices when storing hose.

9.1 Age Control—Maintain a system of age control to determine that hose is used before its shelf life has expired. Shelf life is the period of time when it is reasonable to expect the hose to retain full capabilities for rendering the intended service.

Store hose in a manner that facilitates age control and first-in, first-out usage based on manufacturing date on hose or hose assembly. Per SAE J517:

a. Shelf life of rubber hose in bulk form, or in hose assemblies passing visual inspection and proof test, is forty quarters (ten years) from the date of vulcanization.

b. Shelf life of thermoplastic and polytetrafluoroethylene hose is considered to be unlimited.

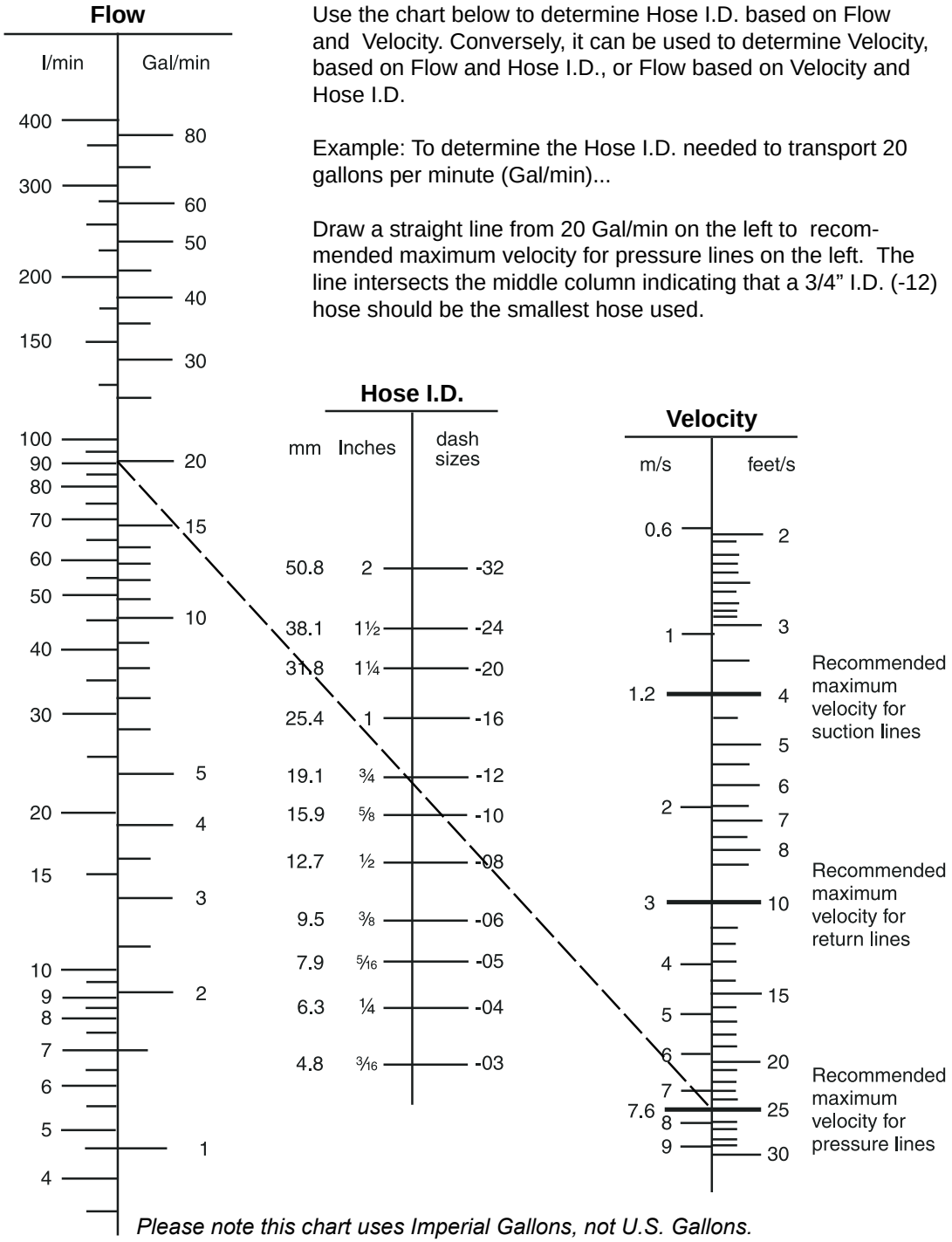
NOMOGRAPHIC CHART

Flow Capacity of Hose Assemblies
Recommended Flow Velocities

Use the chart below to determine Hose I.D. based on Flow and Velocity. Conversely, it can be used to determine Velocity, based on Flow and Hose I.D., or Flow based on Velocity and Hose I.D.

Example: To determine the Hose I.D. needed to transport 20 gallons per minute (Gal/min)...

Draw a straight line from 20 Gal/min on the left to recommended maximum velocity for pressure lines on the left. The line intersects the middle column indicating that a 3/4" I.D. (-12) hose should be the smallest hose used.



Please note this chart uses Imperial Gallons, not U.S. Gallons.

To convert Imperial Gallons to U.S Gallons, multiply the volume by 1.201

ENDURO MULTISPIRAL HOSE

ENDURO6000

ENDURO ST COVER - FOUR/SIX SPIRAL WIRE HOSE
SPIRALLED WIRE REINFORCED HOSE - SAE 100
R15 - MILLION IMPULSE CYCLES

- Comes with SuperTuff (ST) cover for increased protection against abrasion in severe operating environments
- Recommended for: Extremely high pressure and high impulse hydraulic applications.
- Internal tube: Synthetic rubber, resistant against hydraulic fluids (HL, HLP, HLPD, HVLP, HFA, HFAS, HFB,HFC) and bio-degradable hydraulic fluids.
- Reinforcement: Four (six for -24) alternating layers of spiralled, high tensile steel wires.
- External cover: Weather & abrasion resistant synthetic rubber. MSHA approved.
- Temperature range: -40°C to +121°C
- Standards: ISO 18752-CC, Exceeds SAE 100 R15.
- Characteristics: Extra flexible, up to 1/2 SAE bend radius

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - Inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
ENDURO6000-06	06	10	3/8	20.2	6100	420	24400	1680	65
ENDURO6000-08	08	12	1/2	22.9	6100	420	24400	1680	90
ENDURO6000-10	10	16	5/8	26.5	6100	420	24400	1680	100
ENDURO6000-12	12	19	3/4	30.5	6100	420	24400	1680	120
ENDURO6000-16	16	25	1	37.5	6100	420	24400	1680	150
ENDURO6000-20	20	32	1 1/4	47.3	6100	420	24400	1680	400
ENDURO6000-24	24	38	1 1/2	57.4	6100	420	24400	1680	460

ENDURO5000

ENDURO ST COVER - FOUR SPIRAL WIRE HOSE SPIRALLED WIRE REINFORCED HOSE - SAE 100 R13 - MILLION IMPULSE CYCLES

- Comes with SuperTuff (ST) cover for increased protection against abrasion in severe operating environments
- Recommended for: Extremely high pressure and high impulse hydraulic applications.
- Internal tube: Synthetic rubber, resistant against hydraulic fluids (HL, HLP, HLPD, HVLP, HFA, HFAS, HFB,HFC) and bio-degradable hydraulic fluids.
- Reinforcement: Four (six for -32) alternating layers of spiralled, high tensile steel wires.
- External cover: Weather & abrasion resistant synthetic rubber. MSHA approved.
- Temperature range: -40°C to +121°C
- Standards: ISO 18752-CC Exceeds SAE 100 R13.
- Characteristics: Extra flexible, up to 1/2 SAE bend radius

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - Inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
ENDURO5000-06	06	10	3/8	20.2	5510	380	22040	1520	65
ENDURO5000-08	08	12	1/2	22.9	5510	380	22040	1520	90
ENDURO5000-10	10	16	5/8	26.5	5510	380	22040	1520	100
ENDURO5000-12	12	19	3/4	30.5	5510	380	22040	1520	120
ENDURO5000-16	16	25	1	37.9	5075	350	20300	1400	150
ENDURO5000-20	20	32	1 1/4	45.9	5075	350	20300	1400	210
ENDURO5000-24	24	38	1 1/2	53.4	5075	350	20300	1400	250
ENDURO5000-32	32	51	2	71.5	5075	350	20300	1400	540

ENDURO4000

ENDURO ST COVER - FOUR/SIX SPIRAL WIRE HOSE
SPIRALLED WIRE REINFORCED HOSE - SAE 100
R12 - MILLION IMPULSE CYCLES

- Comes with SuperTuff (ST) cover for increased protection against abrasion in severe operating environments
- Recommended for: Extremely high pressure and high impulse hydraulic applications.
- Internal tube: Synthetic rubber, resistant against hydraulic fluids (HL, HLP, HLPD, HVLP, HFA, HFAS, HFB,HFC) and bio-degradable hydraulic fluids.
- Reinforcement: Four alternating layers of spiralled, high tensile steel wires.
- External cover: Weather & abrasion resistant synthetic rubber. MSHA approved.
- Temperature range: -40°C to +121°C
- Standards: ISO 18752-CC Exceeds SAE 100 R12.
- Characteristics: Extra flexible, up to 1/2 SAE bend radius

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - Inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
ENDURO4000-32	32	51	2	68.0	4060	280	16240	1120	390

MULTISPIRAL HOSE

HX4K

FOUR SPIRAL WIRE HOSE
SPIRALED WIRE REINFORCED HOSE - SAE 100 R12

- Due to manufacturing tolerances, external dimension is an average.
- Recommended for: Very high pressure hydraulic applications.
- Suitable for: Mineral & vegetable oils, water-based solutions, water, air & inert gases.
- Internal tube: Synthetic rubber
- Reinforcement: Four alternating layers of spiralled, high tensile steel wires.
- External cover: Weather and abrasion resistant synthetic rubber. MSHA approve.
- Temperature range: -40°C to +121°C (125°C discontinuous)
- Standards: Hydraulink proprietary. Exceeds EN 856 R12. SAE 100 R12.
- Characteristics: Extremely flexible, 1/2 SAE bend radius.

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - Inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
HX4K-06	06	10	3/8	19.7	4100	280	16400	1120	65
HX4K-08	08	12	1/2	22.7	4100	280	16400	1120	90
HX4K-10	10	16	5/8	26.3	4100	280	16400	1120	100
HX4K-12	12	19	3/4	30	4100	280	16400	1120	120
HX4K-16	16	25	1	37	4100	280	16400	1120	150
HX4K-20	20	32	1 1/4	44.6	4100	280	16400	1120	210
HX4K-24	24	38	1 1/2	51.6	4100	280	16400	1120	290

SLIMLINE WIRE BRAID HOSE

H16

R16 TWO WIRE BRAID HOSE
BRAIDED WIRE REINFORCED HOSE - SAE 100R16

- Due to manufacturing tolerances, the external dimension is an average.
- Recommended for: medium pressure hydraulic applications.
- Suitable for: Mineral & vegetable oils, water-based solutions, water, air & inert gases.
- Internal tube: Synthetic rubber.
- Reinforcement: Two high-tensile steel braids.
- External cover: H.A.R.C weather & high abrasion resistance synthetic rubber. MSHA approved.
- Temperature range: -40°C to 100°C (125°C discontinuous)
- Standards: Meets or exceeds SAE 100R16, EN857 2SC.
- Characteristics: Compact construction, extra flexible.

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
H16-04ST	04	6	1/4	13.2	6100	420	24400	1680	45
H16-06ST	06	10	3/8	16.7	5100	350	20400	1400	65
H16-08ST	08	12	1/2	20.1	5100	350	20400	1400	90

H19

R19 TWO WIRE BRAID HOSE
BRAIDED WIRE REINFORCED HOSE - SAE 100R19

- Due to manufacturing tolerances, the external dimension is an average.
- Recommended for: Medium pressure hydraulic applications.
- Suitable for: Mineral & vegetable oils, water-based solutions, water, air & inert gases.
- Internal tube: Synthetic rubber.
- Reinforcement: One high-tensile steel braid for sizes -04, -06 -08 & -10 and two high-tensile steel braids for sizes -12 & -16.
- External cover: Weather & high abrasion resistance synthetic rubber. MSHA approved.
- Temperature range: -40°C to 100°C (125°C discontinuous)
- Standards: SAE 100R19.
- Characteristics: Compact construction, extra flexible.

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
D19-10ST	10	16	5/8	23.8	4100	280	16400	1120	100
H19-12ST	12	19	3/4	27.8	4100	280	16400	1120	120

H17

R17 ONE/TWO WIRE BRAID HOSE
BRAIDED WIRE REINFORCED HOSE - SAE 100R17

- Due to manufacturing tolerances, the external dimension is an average.
- Recommended for: Medium pressure hydraulic applications.
- Suitable for: Mineral & vegetable oils, water-based solutions, water, air & inert gases.
- Internal tube: Synthetic rubber.
- Reinforcement: One high-tensile steel braid for sizes -04, -06, -08 and two high-tensile steel braids for sizes -12, -16:
- External cover: Weather & high abrasion resistance synthetic rubber. MSHA approved.
- Temperature range: -40°C to 100°C (125°C discontinuous)
- Standards: SAE 100R17.
- Characteristics: Compact construction, extra flexible.

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
H17-05ST	05	8	5/16	14	3000	210	12000	840	55
H17-04ST	04	6	1/4	12.3	3000	210	12000	840	50
H17-06ST	06	10	3/8	15.9	3000	210	12000	840	65
H17-08ST	08	12	1/2	19.1	3000	210	12000	840	90
H17-12ST	12	19	3/4	28	3000	210	12000	840	100
H17-16ST	16	25	1	35.3	3000	210	12000	840	150

WIRE BRAID HOSE - 1SN/2SN

H2T

TWO WIRE BRAID HOSE
BRAIDED WIRE REINFORCED HOSE - EN 853 2SN

- Due to manufacturing tolerances, the external dimension is an average.
- Recommended for: High to medium pressure hydraulic applications.
- Suitable for: Mineral & vegetable oils, water-based solutions, water, air & inert gases.
- Internal tube: Synthetic rubber.
- Reinforcement: Two high tensile steel wire braids.
- External cover: Weather & abrasion resistant synthetic rubber. MSHA approved.
- Temperature range: -40°C to +100°C constant (125°C discontinuous).
- Standards: EN 853 2SN, SAE 100R2AT.

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - Inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
H2T-04	04	6	1/4	14.3	5800	400	23200	1600	100
D2T-05	05	8	5/16	16	5100	350	20400	1400	115
H2T-06	06	10	3/8	18.4	4800	330	19200	1320	125
H2T-08	08	12	1/2	21.3	4000	275	16000	1100	180
H2T-10	10	16	5/8	24.7	3600	250	14400	1000	205
H2T-12	12	19	3/4	28.6	3100	215	12400	860	240
H2T-16	16	25	1	37.2	2400	165	9600	660	300
H2T-20	20	32	1 1/4	46.7	1800	125	7200	500	420
H2T-24	24	38	1 1/2	53.7	1300	90	5200	360	500
H2T-32	32	51	2	67	1150	80	4600	320	630

H1T

ONE WIRE BRAID HOSE

BRAIDED WIRE REINFORCED HOSE - EN853 1SN

- Due to manufacturing tolerances, the external dimension is an average.
- Recommended for: Medium pressure hydraulic applications.
- Suitable for: Mineral & vegetable oils, water-based solutions, water, air & inert gases.
- Internal tube: Synthetic rubber.
- Reinforcement: One high-tensile steel braid.
- External cover: Weather & abrasion resistant synthetic rubber. MSHA approved.
- Temperature range: -40°C to 100°C (125°C discontinuous)
- Standards: EN 853 1SN, SAE 100R1AT.

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
D1T-03	03	5	3/16	11.5	3650	250	1460	1000	90
H1T-04	04	6	1/4	12.8	3250	225	13000	900	100
H1T-06	06	10	3/8	16.9	2600	180	10400	720	125
H1T-08	08	12	1/2	19.9	2300	160	9200	640	180
D1T-10	10	16	5/8	23.1	1900	130	7600	520	205
H1T-12	12	19	3/4	27.1	1500	105	6000	420	240
H1T-16	16	25	1	35.1	1300	87	5200	348	300
H1T-20	20	32	1 1/4	42.5	900	62	3600	248	450
H1T-24	24	38	1 1/2	49.8	725	50	2900	200	500
H1T-32	32	51	2	63.9	580	40	2320	160	630

LOW PRESSURE HOSE

HSD

SUCTION AND DELIVERY HOSE
FIBRE AND WIRE REINFORCED HOSE

- Suction and delivery hose for filling and discharging tanks, petrol tankers and ships with unleaded fuels (EN228:2017) with an aromatic content of components 50% max
- Suitable for industrial oils, diesel oils (EN 590:2017), fuel oils (DIN 51 603 parts 1 - 5) and mineral oil-based hydraulic oils
- Safety Factor 3:1
- Vacuum resistance up to -0.9 bar
- Internal tube: NBR, black, electrically conductive, smooth
- Reinforcement: Textile wrapped, zinc plated double steel wire helix (DN > 50,0 zinc plated steel wire helix), 2 crossed copper wires
- External cover: SBR/EPDM, black, resistant to ozone and weather, abrasion resistant, resistant to oil (according SAE J517:2017), cloth impression.
- -40°C / +90°C, oils +100°C

Part Number	Internal Size	Internal DN	Internal Diameter (in)	External Diameter (mm)	Working Pressure (psi)	Working pressure (bar)	Min burst pressure (psi)	Min burst pressure (bar)	Min bend radius (mm)
HSD-12	12	19	3/4	29	145	10	435	30	45
HSD-16	16	25	1	35	145	10	435	30	55
HSD-20	20	31	1.1/4	42	145	10	435	30	65
HSD-24	24	38	1.1/2	48	145	10	435	30	80
HSD-32	32	51	2	61.8	145	10	435	30	130
HSD-40	40	63	2.1/2	75.5	145	10	435	30	180
HSD-48	48	76	3	88.2	145	10	435	30	350

HIGH TEMPERATURE HOSE

H2CXT

HIGH TEMP TWO WIRE BRAID HOSE
FAHRENHEIT HIGH TEMP - BRAIDED WIRE REINFORCED HOSE - EN 857 2SC

- Due to manufacturing tolerances, the external dimension is an average.
- Recommended for: High to medium pressure hydraulic applications.
- Suitable for: Mineral & vegetable oils, diesel, water-based solutions, water, air & inert gases.
- Internal tube: Synthetic rubber.
- Reinforcement: Two high tensile steel wire braids.
- External cover: Weather & abrasion resistant synthetic rubber. MSHA approved.
- Temperature range: -40°C to +135°C constant (150°C discontinuous). Air not higher than 121°C
- Standards: EN 857 2SC, SAE J30

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - Inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
H2CXT-04	04	6	1/4	13.4	5800	400	23200	1600	50
H2CXT-06	06	10	3/8	17.3	4800	330	19200	1320	65
H2CXT-08	08	12	1/2	20.5	4000	275	16000	1100	90
H2CXT-10	10	16	5/8	24.2	3600	250	14400	1000	100
H2CXT-12	12	19	3/4	27.8	3100	215	12400	860	120
H2CXT-16	16	25	1	34.7	2400	165	9600	660	150
H2CXT-20	20	32	1 1/4	43.3	1800	125	7200	500	210
H2CXT-24	24	38	1 1/2	49.6	1300	90	5200	360	300
D2XT-32	32	51	2	67	1150	80	4600	320	630

PRESSURE WASHER HOSE

HJW250

PRESSURE WASHER HOSE 250 BAR
BRAIDED WIRE REINFORCED HOSE

- Due to manufacturing tolerances, the external dimension is an average.
- Suitable for: Water, water-soap, emulsion.
- Internal tube: Synthetic rubber.
- Reinforcement: One high-tensile steel braid.
- External cover: Weather & high abrasion resistance synthetic rubber. Blue cover.
- Temperature range: -40°C to +150°C.
- Standards: Proprietary.
- Characteristics: Compact construction, extra flexible.

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
HJW250-04 B	04	6	1/4	12.8	3625	250	14500	1000	100
HJW250-06 B	06	10	3/8	16.9	3625	250	14500	1000	120

HJW400

PRESSURE WASHER HOSE 400 BAR
BRAIDED WIRE REINFORCED HOSE

- Due to manufacturing tolerances, the external dimension is an average.
- Suitable for: Water, water-soap, emulsion.
- Internal tube: Synthetic rubber.
- Reinforcement: Two high-tensile steel braids.
- External cover: Weather & high abrasion resistance synthetic rubber. Blue cover.
- Temperature range: -40°C to +150°C.
- Standards: Proprietary.
- Characteristics: Compact construction, extra flexible.

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
HJW400-06 B	06	10	3/8	17.5	5800	400	23200	1600	80

JACKING HOSE

DSJ

TWO WIRE BRAID JACKING HOSE
BRAIDED WIRE REINFORCED JACK HOSE

- Due to manufacturing tolerances, the external dimension is an average.
- Static (non-impulse) pressure rating for hydraulic jack applications only, reduced safety factor (2:1)
- Recommended for: Hydraulic jack applications.
- Suitable for: Mineral & vegetable oils.
- Internal tube: Synthetic rubber.
- Reinforcement: Two high-tensile steel braids.
- External cover: Weather & high abrasion resistance synthetic rubber. MSHA approved.
- Temperature range: -40°C to +100°C (150°C discontinuous)
- Standards: Proprietary. (Meets performance requirements of former IJ100 standard)
- Characteristics: Compact construction.

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
DSJ-04	04	6	1/4	13.3	10000	700	20000	1400	50
DSJ-06	06	10	3/8	17.3	10000	700	20000	1400	65

FIRE SUPPRESSION HOSE

H1FS

ONE WIRE BRAID HOSE
RED FIRE SUPPRESSANT BRAIDED WIRE
REINFORCED HOSE - SAE 100R1 Type AT

- Due to manufacturing tolerances, the external dimension is an average.
- Recommended for: Medium pressure hydraulic applications.
- Suitable for: Mineral & vegetable oils, water-based solutions, water, air & inert gases.
- Internal tube: Synthetic rubber.
- Reinforcement: One high-tensile steel braid.
- External cover: Weather & abrasion resistant synthetic rubber. MSHA approved.
- Temperature range: -40°C to 100°C (125°C discontinuous)
- Standards: EN 853 1SN, SAE 100R1AT.

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
H1FS-04	04	6	1/4	12.8	3250	225	13000	900	100
H1FS-08	08	12	1/2	19.9	2300	160	9200	640	180
H1FS-12	12	19	3/4	27.1	1500	105	6000	420	240

PILOT LINE HOSE

H1PL

ONE WIRE BRAID HOSE
PILOT LINE HOSE WITH EMBOSSED LAYLINE

- Due to manufacturing tolerances, the external dimension is an average.
- Recommended for: Pilot line applications.
- Suitable for: Mineral & vegetable oils, water-based solutions, water, air & inert gases.
- Internal tube: Synthetic rubber.
- Reinforcement: One high-tensile steel braid.
- External cover: Weather & abrasion resistant synthetic rubber. MSHA approved.
- Temperature range: -40°C to 100°C (125°C discontinuous)
- Standards: EN 853 1SN, SAE 100R1AT.

Part Number	Internal Size	Internal Diameter - DN	Internal Diameter - inches	External Diameter - mm	Working Pressure - psi	Working pressure - bar	Min burst pressure - psi	Min burst pressure - bar	Min bend radius - mm
H1PL-04	04	6	1/4	11.5	1750	120	7000	480	25
H1PL-06	06	10	3/8	14.8	1450	100	5800	400	40