



LET-LOK®

TUBE FITTINGS



1/16" Through 1 1/2"-inch
2 mm Through 25 mm-Metric

LET-LOK® DESCRIPTION

The HAM-LET® GROUP has produced high quality tube and pipe fittings in various materials for high pressure applications since its establishment in 1950.

For almost five decades, through tremendous efforts in research and development, HAM-LET® has gained an excellent reputation as a leading manufacturer of high pressure instrumentation products.

The LET-LOK® range of connectors has been developed to fill the rapidly increasing demand for tube fittings suitable for high pressure use in environments such as petrochemical, fluid, power, nuclear, electronic, as well as other major industries.

LET-LOK® tube fittings have been carefully manufactured and tested to withstand the demands of high performance tube fittings, such as high pressure, impulse, vibration, vacuum and temperature.

These tube fittings are manufactured to exacting tolerances using the most modern and advanced computerized automation. One of the main conditions required to producing these precision machined fittings is the maintenance of stringent quality control in conjunction with skilled craftsmen.

LET-LOK® HOW DOES IT WORK ?

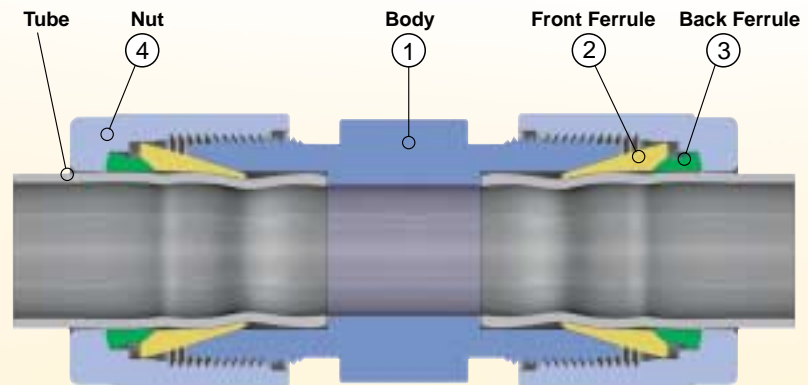
The LET-LOK® tube fitting is a mechanism used for both sealing and gripping tubing. The mechanical advantage and geometry of fitting produces a leak-tight assembly.

To assemble, simply insert the tube into the complete assembly until the tube bottoms-out against the shoulder of the fitting body.

The two ferrules are driven forward between the nut and fitting body using the mechanical force created by rotating the nut clockwise. The back ferrule (3)

is driven against the tapered rear of the front ferrule (2) and the front ferrule is driven by force into the tapered mouth of the body.

The rear ferrule is swaged radially inwards on the tube while lifting the front ferrule out to form a full faced seal on the tapered surface of the body. The 1¼ turn on the nut from the hand tight position assures consistent drive of the sealing members. This ensures an effective seal against high pressure as well as ultra high vacuum conditions.



LET-LOK® tube fittings are composed of four parts:
1. body 2. front ferrule 3. back ferrule 4. nut.

LET-LOK® INSTALLATION INSTRUCTIONS

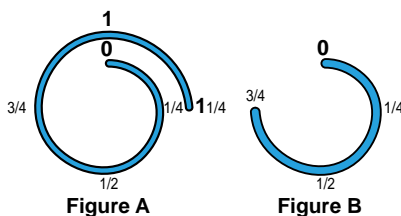
LET-LOK® fittings are supplied assembled, finger tight. Disassembly before use can allow the entry of dirt or other particles.



Insert the tubing into the LET-LOK® fitting. Check that the tube rests firmly on the fitting shoulder and that the nut is finger tight. At this point it is recommended that a scribe mark be drawn on the hex of the nut extending onto the fitting body. This mark will serve as an indicator for the starting point and proper pull-up.



Tighten the nut. (see Fig. A & B) 1 1/4 turns of the nut are required for 1/4" (6 mm) and higher. 3/4 turn of the nut is required for 3/16" (4 mm) and lower.



Warning

Do not hold the tube in a vise in the place where it will be inserted into the fitting (the vise will leave a mark on the tube that may cause leaks, and might cause ovality).

REASSEMBLY INSTRUCTIONS

LET-LOK® connections may be disconnected and remade repeatedly, without loss of leaktight seal.

1. Before disconnecting, mark the position of the nut in relation to the fitting body.
2. To reassemble, use a wrench to tighten nut to original position.
3. Tighten slightly with wrench until a slight rise in torque is felt.

TUBE CUTTING

Two different methods can be used to cut tubes:

1. Tube cutter
2. Hacksaw

TUBE CUTTER

To attain a leak free connection, the tubing must be cut squarely. A good quality tube cutter with the appropriate blade for the tubing material is recommended.

Do not try to reduce the time of cutting by taking deep cuts with each turn of the cutter. This will work harden the tube.

The end of the tube must be deburred to avoid damage to the fitting and to ensure that the tube reaches the bottom of the fitting.

HACKSAW CUTTING

In order to cut the tube with a hacksaw and get square ends, the tube must be cut with guide blocks.

This method of cutting necessitates deburring of the tube ends.

TUBE HANDLING

Scratches on the tube might cause leaks. It is, therefore, important to handle the tube carefully to reduce the risk of leaks.

SOME PRECAUTIONS TO BE TAKEN:

1. Tubes must not be dragged on the floor.
2. Tubes must not be dragged out of a tubing rack, especially in case of large OD tubes.

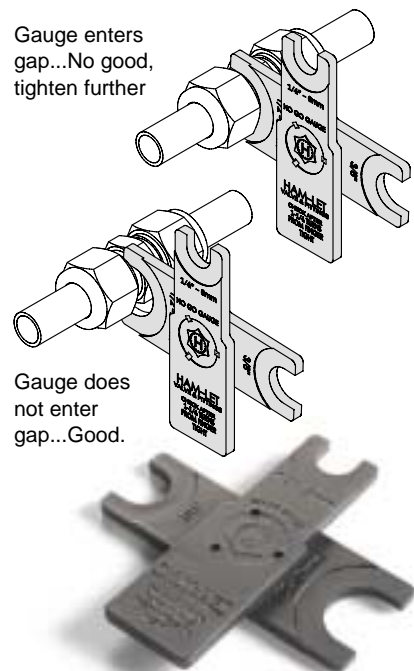
COPPER TUBING

If using copper tubing from a roll, hold the end of the tube and roll the roll outwards allowing the tubing to lie on a flat surface.

INSPECTION GAUGE

Use: This is a "No-Go" gauge and should be used as follows:

1. Make up the fitting according to the following instructions: 1/4 inch (6mm), 3/8 inch, 1/2 inch (12mm) - make up 1.1/4 turns from finger tight.
2. Check gap between nut and body, using the appropriate sized gauge. If the gauge slides easily into the gap, tighten the nut further until gauge can not enter the gap.



To order, use part No. 3900098

Available only in:

1/4 inch (6mm), 3/8 inch,
1/2 inch (12mm) - make up 1.1/4

LET-LOK® PHYSICAL DIFFERENCES AND MARKING

LET-LOK® METRIC FITTINGS:

Tee & Elbow (see Fig. 1),

Body marked: MM

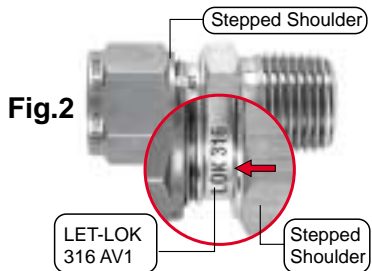
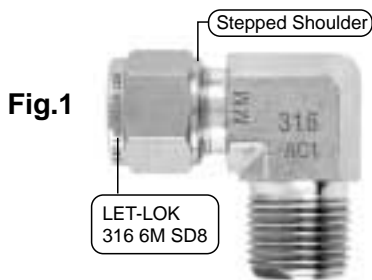
Straight Connectors (see Fig. 2)

Body: Stepped shoulder,

Marked: LET-LOK 316 AV1⁽²⁾

Nut: (see Figs.1 & 2) Stepped shoulder

Shoulder marked LET-LOK 316 6M⁽¹⁾ SD8⁽²⁾



LET-LOK® INCH FITTINGS:

Tee & Elbow (See Fig. 3)

Straight Fittings, (see Fig. 4)

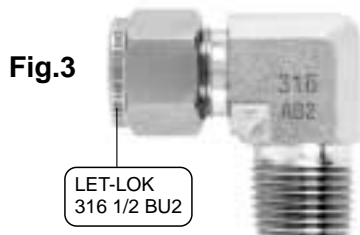
Body: Shoulder marked:

LET-LOK 316 AV2⁽²⁾

Nut (See Fig. 3 & 4): Shoulder marked

LET-LOK 316 1/2⁽¹⁾ BU2⁽²⁾

⁽¹⁾ Tube O.D. ⁽²⁾ Material Batch



LET-LOK® HIGH SAFETY

In applications where severe conditions and high pressure exist, we recommend the following installation procedures:

1. Check that the nut is finger tight.
2. Insert the tube (up to the shoulder).
3. Rotate the nut with a wrench until the tube does not rotate freely.
4. Mark position of the nut.
5. Rotate the nut 1¹/₄ turns.

This method ensures that even if the tube O.D. is at the minimum tolerance, the ferrules will be in contact with the tube for the full 1¹/₄ rotation.

TUBING DATA FOR LET-LOK® FITTINGS

In order to assure maximum fitting reliability and performance, great care should be given when selecting the tubing for each application.

TUBE SELECTION:

Four variables must be considered when ordering tube for use with LET-LOK® fittings:

1. Material
2. Tube wall thickness
3. Tube surface finish
4. Tube hardness

Tubing should comply with standard ASTM A213 or ASTM A269, be seamless, and fully annealed.

The tube must be free of scratches and suitable for bending and flaring.

TUBE OD TOLERANCES:

$$\left. \begin{array}{l} 1/16" - 1/8 \\ 2\text{mm} - 3\text{mm} \end{array} \right\} \pm 0.003"$$

$$\left. \begin{array}{l} 3/16" - 1-1/4" \\ 4\text{mm} - 25\text{mm} \end{array} \right\} \pm 0.005"$$

$$1-1/2" \left. \right\} \pm 0.01"$$

Ovality of twice OD tolerance is not suitable for LET-LOK fittings. The tube must be reasonably round. The ends of the tube must be free of burrs.

Tubing hardness: The hardness of the tube must be lower than the hardness of the fitting material. The hardness must be not more than Rockwell HRB 80.

LET-LOK® TUBING DATA

Table 1: STAINLESS STEEL TUBING WALL THICKNESS OF TUBE IN INCH

Annealed 304 or 316 stainless steel tubing complying with ASTM A213, A269 or equivalent specifications. Based on ultimate tensile strength of 75,000 psi (5167 bar). For metal temp. from -20°F - 100°F (-29°C - 37°C).

Suggested ordering information: Fully annealed high quality (Type 304 or 316) stainless steel hydraulic tubing ASTM A269 or A213 or equivalent, seamless or welded and drawn with a hardness of Rb80 or less. Tubing should be without scratches and suitable for flaring and bending.

Tubing O.D.		.010	.012	.014	.016	.020	.028	.035	.049	.065	.083	.095	0.109	0.120	0.134	0.156	0.188
mm	Inch																
	1/16	5600	6860	8150	9480	12.080											
2	1/8						8550	10950									
3	3/16						5500	7100	10300								
6	1/4						4100	5200	7600	10300							
8	5/16							4100	5900	8100							
10	3/8							3350	4850	6550							
12	1/2							2650	3750	5150	6750						
16	5/8								2950	4050	5250	6050					
20	3/4								2450	3350	4250	4950	5850				
22	7/8								2050	2850	3650	4250	4850				
25	1"									2400	3100	3600	4200	4700			
	1-1/4"										2400	2800	3300	3600	4100	4900	
	1-1/2"											2300	2700	3000	3400	4000	4900

Working pressure (psig) for seamless tubing.
 Multiply pressure rating by .80 for single welded tubing.
 Multiply pressure rating by .85 for double welded tubing.

Table 2: COPPER TUBING WALL THICKNESS OF TUBE IN INCH

Annealed copper seamless tubing complying with ASTM B68 and ASTM B75 specifice in temper designation 060. Based on ultimate tensile strength 30,000 psi (2067 bar). For metal temperatures from -20°F to 100° F (-29°C to 37°C). Suggested ordering information: High quality soft annealed seamless copper tubing ASTM B75 or equivalent.

Tubing O.D.		.028	.035	.049	.065	.083	.095	0.109	0.12
mm	Inch								
2	1/8	2700	3600						
3	3/16	1800	2300	3400					
6	1/4	1300	1600	2500	3500				
8	5/16		1300	1900	2700				
10	3/8		1000	1600	2200				
12	1/2		800	1100	1600	2100			
16	5/8			900	1200	1600	1900		
20	3/4			700	1000	1300	1500	1800	
22	7/8			600	800	1100	1300	1500	
25	1			500	700	900	1100	1300	1500

Table 3: Factors used to determine allowable pressure at higher temperatures

To determine allowable pressure at higher temperatures, multiply allowable working pressure from Tables 1 & 2 by factor shown in Table 3.

For example: The allowable pressure for Type 316 stainless steel, size 1/2" OD x .049" wall at 800°F(427°C) would be equivalent to 3750 psi x 0.79 = 2962.5 psi.

°F	°C	A.I.S.I. 316	Copper
200	93	1	0.80
400	204	0.96	0.50
600	316	0.85	-
800	427	0.79	-
1000	538	0.76	-
1200	649	0.37	-

Table 4: Gas Application Tubing INCH

Gases are characterized by small molecules which can escape through the smallest leak path. For gas applications, It is therefore recommended for gas applications to select tubing with greater wall thickness. Table 4 shows the recommended wall thicknesses for greater safety and efficiency.

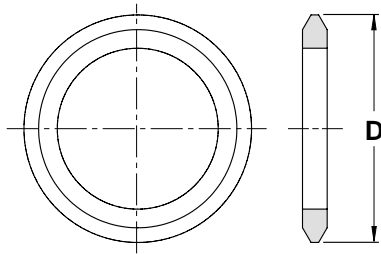
Tubing O.D.	Min. Nominal Wall Thickness
1/8"	0.028"
3/16"	0.028"
1/4"	0.028"
5/16"	0.035"
3/8"	0.035"
1/2"	0.049"
5/8"	0.065"
3/4"	0.065"
7/8"	0.083"
1"	0.083"

METRIC

Tubing O.D.	Min. Nominal Wall Thickness
3 mm	0.8 mm
6 mm	0.8 mm
8 mm	1.0 mm
10 mm	1.0 mm
12 mm	1.0 mm
14 mm	1.2 mm
16 mm	1.5 mm
18 mm	1.5 mm
20 mm	1.8 mm
22 mm	2.0 mm
25 mm	2.2 mm

Warning! For Your Safety The system designer and user have the sole responsibility to select products suitable for their special application requirements to ensure the proper installation, operation and maintenance of the product. Application details, material compatibility and product ratings should all be considered in the individual selection. Improper selection or use of products can cause property damage or personal injury.

LET-LOK® STOP COLLAR



LET-LOK		D	
Inch	Inch	mm	
1/4	0.69	17.5	
3/8	0.84	20.6	
1/2	1.10	27.0	
3/4	1.31	33.3	
1	1.68	42.7	



- Assembly Instructions - Stop Collar**
1. Remove nut and ferrules from fitting.
 2. Insert stop collar.
 3. Assemble nut and ferrules - until finger tight.
 4. Make up the fitting until stop collar no longer rotates (feel with finger). At this stage it is guaranteed that the fitting is made up correctly.

HOW TO ORDER: Assembled Stop Collar (with fitting)

768L	SS = Stainless Steel B = Brass	1/4	X	1/4	SC	S = Stainless Steel C = Carbon Plated
Fitting type (male LET-LOK connector)	Fitting material	Tube O.D. The O.D. size is always the first to be described		1/4 NPT	Stop Collar	Stop Collar material

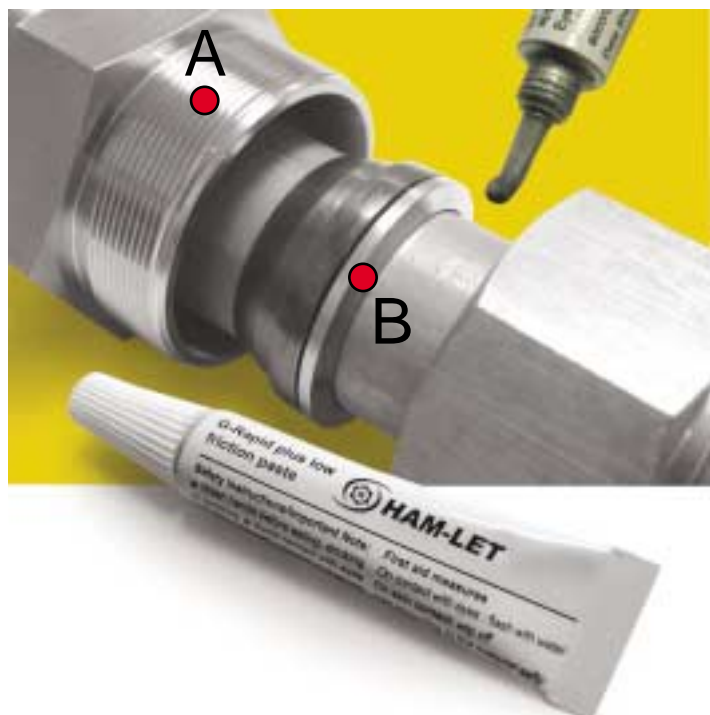
HOW TO ORDER: Stop collar Only:

1/4	SC	S = Stainless Steel C = Carbon Plated
Tube O.D. The O.D. size is always the first to be described	1/4 NPT	Stop Collar material

INSTALLATION INSTRUCTION FOR LET-LOK® FITTINGS 1 1/4" - 1 1/2"

1. Close the nut and ferrules on the tube with hydraulic tool.
2. Open and release from the tool.
3. Apply the G-Rapid paste on areas **A** and **B**.
4. Tighten the nut on body 1/2 a turn with a wrench

To order, use part No. 3900098



HOW TO ORDER

EXAMPLE

768L

 Fitting type
 (male LET-LOK
 connector)

 SS = Stainless Steel
 B = Brass

1/4

X

1/4

 Tube O.D.
 The O.D. size is always the first
 to be described

LET-LOK® fitting part numbers are constructed from symbols that identify the type of material and size of the fitting. The part number describes a completely assembled fitting from 1/16" O.D. to 1" O.D.

 760 LB 08
 BACK FERRULE

 760 LF 08
 FRONT FERRULE

 760 LI 08
 TUBE INSERT

 761 L 09
 NUT

 762 L 09
 UNION

 763 L 10
 REDUCING UNION

 764 L 12
 UNION TEE

 764 LR 13
 REDUCING UNION TEE

 765 L 14
 UNION ELBOW

 766 L 15
 FEMALE CONNECTOR

 766 LR 16
 FEMALE CONNECTOR

 766 LG 16
 FEMALE CONNECTOR

 767 LT 17
 REDUCER

 767 LM 20
 REDUCING PORT
 CONNECTOR

 767 LP 20
 PORT CONNECTOR

 768 L 21
 MALE CONNECTOR

 768 LG 23
 MALE CONNECTOR

 768 LR 24
 MALE CONNECTOR

 768 LOK 25
 MALE CONNECTOR

 768 LOB 26
 MALE CONNECTOR


768 LOP 26

MALE CONNECTOR

**768 LO 26**

MALE CONNECTOR

**768 LN 27**MALE PIPE WELD
CONNECTOR**768 LW 28**

TUBE SOCKET WELD UNION

**769 L 28**

MALE ELBOW

**769 LR 30**

MALE ELBOW

**769 LN 30**

MALE PIPE WELD ELBOW

**769 LW 31**

SOCKET WELD ELBOW

**770 L 31**

FEMALE ELBOW

**771 L 32**

MALE RUN TEE

**771 LF 32**

FEMALE RUN TEE

**772 L 33**

MALE BRANCH TEE

**772 LF 34**

FEMALE BRANCH TEE

**774 L 35**

BULKHEAD UNION

**774 LF 35**BULKHEAD FEMALE
CONNECTOR**774 LT 36**

BULKHEAD REDUCER

**774 LM 36**BULKHEAD MALE
CONNECTOR**7102 L 37**

UNION CROSS

**7108 L 37**

CAP

**7121 L 38**

PLUG

**739 LF 39**FEMALE ADAPTER
TUBE TO PIPE**739 LM 40**MALE ADAPTER
TUBE TO PIPE**761 LFL 41**

LET LOK TO AN ADAPTER

**762 LFL 41**

LET-LOK TO AN UNION

**774 LFL 41**LET-LOK TO
AN BULKHEAD
UNION**961 L 42**

MALE NUT

**962 L 42**

UNION

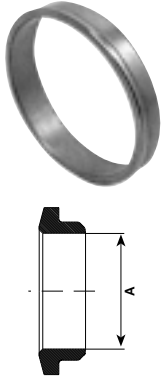
**963 L 42**

REDUCING UNION

**964 L 42**

UNION TEE

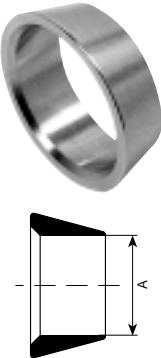
**POSITIONABLE 43**

BACK FERRULE

760 LB Back Ferrule (Metric)

A Tube O.D.
2
3
4
6
8
10
12
14
15
16
18
20
22
25

Back Ferrule (Inch)

A Tube O.D.	
in	mm
1/16	1.58
1/8	3.17
3/16	4.76
1/4	6.35
5/16	7.93
3/8	9.52
1/2	12.70
5/8	15.87
3/4	19.05
7/8	22.22
1	25.40


FRONT FERRULE

760 LF Front Ferrule (Metric)

A Tube O.D.
2
3
4
6
8
10
12
14
15
16
18
20
22
25

Front Ferrule (Inch)

A Tube O.D.	
in	mm
1/16	1.58
1/8	3.17
3/16	4.76
1/4	6.35
5/16	7.93
3/8	9.52
1/2	12.70
5/8	15.87
3/4	19.05
7/8	22.22
1	25.40

FERRULE SETS

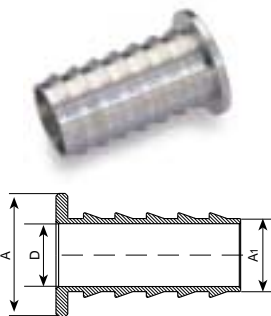
All Let-Lok Ferrules are available as sets.

Ferrule sets simplify stocking and assembly.

Ferrule sets prevent damage of single Ferrules during shipping. The back and front Ferrules are arranged as pairs in the set ready

for easy assembly

To Order:
Please add FS to the product description.

TUBE INSERT

760 LI Tube Insert (Metric)

A Tube O.D. mm	A Tube I.D. mm	D mm
6	4	2.8
8	6	4.4
10	8	6.4
12	8	6.4
12	10	8.3

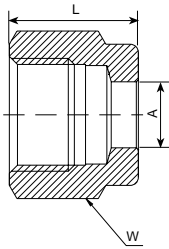
Tube Insert (Inch)

A		A1		D	
in	mm	in	mm	in	mm
3/16	4.76	1/8	3.17	.09	2.28
1/4	6.35	1/8	3.17	.09	2.28
1/4	6.35	.17	4.32	.11	2.79
1/4	6.35	3/16	4.76	.14	3.55
5/16	7.93	1/8	3.17	.09	2.28
5/16	7.93	3/16	4.76	.12	3.05
5/16	7.93	1/4	6.35	.19	9.52
3/8	9.52	3/16	4.76	.12	3.05
3/8	9.52	1/4	6.35	.19	9.52
1/2	12.70	1/4	6.35	.19	9.52
1/2	12.70	3/8	9.52	.31	7.87
5/8	15.87	3/8	9.52	.31	7.87
5/8	15.87	1/2	12.70	.44	11.17
3/4	19.05	1/2	12.70	.44	11.17
3/4	19.05	5/8	15.87	.56	14.22
1	25.40	3/4	19.05	.69	17.52

"D" - Dimension is minimum opening.

Dimensions are for reference only, and are subject to change without notice.

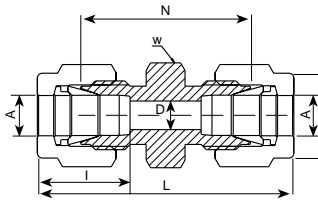
NUT



761 L Nut (Metric)		
A Tube O.D. mm	W Width Across Hex. mm	L mm
2	12	11.9
3	12	11.9
4	12	11.9
6	14	12.7
8	16	13.5
10	19	15.1
12	22	17.4
14	25	17.4
15	25	17.4
16	25	17.4
18	30	17.4
20	32	17.4
22	32	17.4
25	38	20.6

Nut (Inch)					
A Tube O.D.		W Width Across Hex		L	
in	mm	in	mm	in	mm
1/16	1.58	5/16	7.93	.31	7.87
1/8	3.17	7/16	11.11	.47	11.93
3/16	4.76	1/2	12.70	.47	11.93
1/4	6.35	9/16	14.28	.50	12.70
5/16	7.93	5/8	15.87	.53	13.46
3/8	9.52	11/16	17.46	.56	14.22
1/2	12.70	7/8	22.22	.69	17.52
5/8	15.87	1	25.40	.69	17.52
3/4	19.05	1-1/8	28.57	.69	17.52
7/8	22.22	1-1/4	31.75	.69	17.52
1	25.40	1-1/2	38.10	.81	20.57

UNION

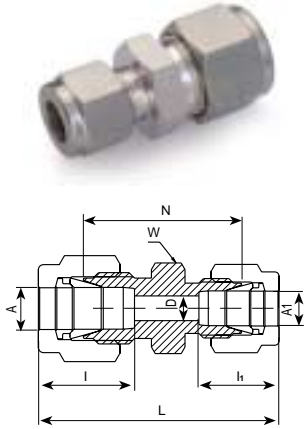


762 L Union (Metric) Tube to Tube						
A Tube O.D. mm	D mm	W Width Across Hex. mm	N mm	L mm	I mm	
2	1.7	12	22.1	35.2	12.9	
3	2.4	12	22.1	35.3	12.9	
4	2.4	12	23.4	36.5	13.7	
6	4.8	14	26.2	41.0	15.3	
8	6.4	15	28.2	43.2	16.2	
10	7.9	18	31.0	45.9	17.2	
12	9.5	22	31.0	51.2	22.8	
14	11.1	24	31.8	52.0	22.8	
15	11.9	24	31.8	52.0	24.4	
16	12.7	24	31.8	52.0	24.4	
18	15.1	27	33.3	53.5	24.4	
20	15.9	30	34.8	55.0	26.0	
22	18.3	30	34.8	55.0	26.0	
25	21.8	35	40.4	65.0	31.3	

762 L Union (Inch) Tube to Tube											
A Tube O.D.		D		W Width Across Hex.		N		L		I	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/16	1.58	.05	1.27	5/16	7.93	.69	17.52	.99	25.14	.34	8.6
1/8	3.17	.09	2.28	7/16	11.11	.88	22.35	1.40	35.56	.50	12.7
3/16	4.76	.12	3.04	7/16	11.11	.95	24.13	1.47	37.33	.54	13.7
1/4	6.35	.19	4.82	1/2	12.70	1.03	26.16	1.61	40.89	.60	15.2
5/16	7.93	.25	6.35	9/16	14.28	1.11	28.2	1.69	42.9	.64	16.3
3/8	9.52	.28	7.11	5/8	15.87	1.19	30.22	1.77	44.95	.66	16.8
1/2	12.70	.41	10.41	13/16	20.63	1.22	30.98	2.02	51.30	.90	22.9
5/8	15.87	.50	12.70	15/16	23.81	1.25	31.75	2.05	52.07	.96	24.4
3/4	19.05	.62	15.74	1-1/16	26.98	1.31	33.27	2.11	53.59	.96	24.4
7/8	22.22	.72	18.28	1-3/16	30.16	1.38	35.05	2.17	55.11	1.02	26.0
1	25.40	.88	22.35	1-3/8	34.92	1.59	40.38	2.55	64.77	1.23	31.3
*1-1/4	31.75	1.09	27.7	1-3/4	44.45	1.89	48.0	3.63	92.2	1.62	41.15
*1-1/2	38.1	1.34	34.0	2-1/8	28.57	2.11	53.6	4.25	107.95	1.97	50.04

*Including low friction paste, See page 5
 "D" - Dimension is minimum opening.
 Dimensions are for reference only, and are subject to change without notice.

NUT



763 L Reducing Union Tube (Metric) to Tube (Metric)

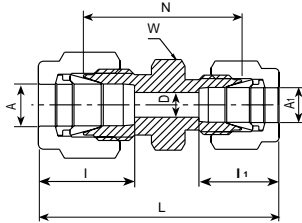
A Tube O.D. mm	A ₁ Tube O.D. mm	D mm	W Width Across Hex. mm	N mm	L mm	I mm	I ₁ mm
3	2	1.7	12	22.1	35.3	12.9	12.9
6	2	1.7	14	24.6	38.6	15.3	12.9
6	3	2.4	14	24.6	38.6	15.3	12.9
6	4	2.4	14	25.4	39.4	15.3	13.7
8	6	4.8	15	27.4	42.3	16.2	15.3
10	6	4.8	18	29.5	44.5	17.2	15.3
10	8	6.4	18	30.0	45.1	17.2	16.2
12	6	4.8	22	29.5	47.0	22.8	15.3
12	8	6.4	22	30.2	47.8	22.8	16.2
12	10	7.9	22	31.0	48.7	22.8	17.2
16	10	7.9	24	31.8	49.5	24.4	17.2
16	12	9.5	24	31.8	52.0	24.4	22.8
18	12	9.5	27	33.3	53.5	24.4	22.8
25	18	15.1	35	38.6	61.0	31.3	24.4
25	20	15.9	35	39.9	62.3	31.3	26.0

763 L Reducing Union Tube (Metric) to Tube (Inch)

A Tube O.D. mm	A ₁ Tube O.D. inch	D mm	W Width Across Hex. mm	N mm	L mm	I mm	I ₁ mm
2	1/4	1.7	14	24.0	38.6	12.9	15.2
3	1/8	2.4	12	22.1	35.2	12.9	12.7
4	1/8	2.4	12	23.4	36.5	13.7	12.7
4	1/4	2.4	14	25.4	39.4	13.7	15.2
6	1/8	2.4	14	24.6	38.5	15.3	12.7
6	1/4	4.8	14	26.2	41.0	15.3	15.2
6	5/16	4.8	14	27.4	42.3	15.3	16.2
8	1/8	2.4	15	25.9	39.9	16.2	12.7
8	1/4	4.8	15	27.4	42.3	16.2	15.2
8	3/8	6.4	16	29.5	43.5	16.2	16.8
10	1/8	2.4	18	27.7	41.8	17.2	12.7
10	1/4	4.8	18	29.5	44.5	17.2	15.2
10	5/16	6.4	18	30.0	45.1	17.2	16.2
10	3/8	7.1	18	31.0	45.9	17.2	16.8
12	5/16	6.4	22	30.2	47.8	22.8	16.2
12	3/8	7.1	22	31.0	48.4	22.8	16.8
12	1/2	9.5	22	31.0	51.2	22.8	22.9
15	1/2	10.3	24	31.8	52.0	24.4	22.9
16	5/8	12.7	24	31.8	52.0	24.4	24.4
18	3/4	15.1	27	33.3	53.5	24.4	24.4

"D" - Dimension is minimum opening.
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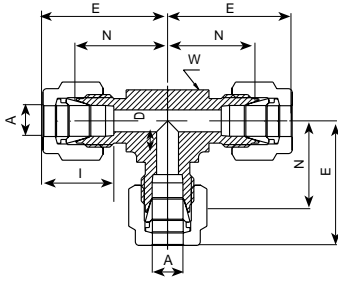
REDUCING UNION



763 L Reducing Union Tube (Inch) to Tube (Inch)															
A Tube O.D.		A ₁ Tube O.D.		D		W Width Across Hex.		N		L		I		I ₁	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/8	3.17	1/16	1.58	.05	1.27	7/16	11.11	.81	20.57	1.22	30.98	.50	12.7	.34	8.6
3/16	4.76	1/16	1.58	.05	1.27	7/16	11.11	.86	21.84	1.27	32.26	.54	13.7	.34	8.6
3/16	4.76	1/8	3.17	.09	2.28	7/16	11.11	.92	23.36	1.44	36.57	.54	13.7	.50	12.7
1/4	6.35	1/16	1.58	.05	1.27	1/2	12.70	.91	23.11	1.35	34.29	.60	15.2	.34	8.6
1/4	6.35	1/8	3.17	.09	2.28	1/2	12.70	.97	24.63	1.52	38.60	.60	15.2	.50	12.7
1/4	6.35	3/16	4.76	.12	3.04	1/2	12.70	1.00	25.40	1.55	37.37	.60	15.2	.54	13.7
5/16	7.93	1/8	3.17	.09	2.28	9/16	14.28	1.02	25.91	1.57	39.88	.64	16.3	.50	12.7
5/16	7.93	1/4	6.35	.19	4.82	9/16	14.28	1.08	27.43	1.66	42.16	.64	16.3	.60	15.2
3/8	9.52	1/16	1.58	.05	1.27	5/8	15.87	1.00	25.40	1.44	36.58	.66	16.8	.34	8.6
3/8	9.52	1/8	3.17	.09	2.28	5/8	15.87	1.06	26.92	1.61	40.89	.66	16.8	.50	12.7
3/8	9.52	1/4	6.35	.19	4.82	5/8	15.87	1.12	28.44	1.70	43.18	.66	16.8	.60	15.2
3/8	9.52	5/16	7.93	.25	6.35	5/8	15.87	1.16	29.46	1.74	44.19	.66	16.8	.64	16.3
1/2	12.70	1/8	3.17	.09	2.28	13/16	20.63	1.12	28.44	1.78	45.21	.90	22.9	.50	12.7
1/2	12.70	1/4	6.35	.19	4.82	13/16	20.63	1.16	29.46	1.85	46.99	.90	22.9	.60	15.2
1/2	12.70	3/8	9.52	.28	7.11	13/16	20.63	1.22	30.98	1.91	48.51	.90	22.9	.66	16.8
5/8	15.87	3/8	9.52	.28	7.11	15/16	23.81	1.25	31.75	1.94	49.27	.96	24.4	.66	16.8
5/8	15.87	1/2	12.70	.41	10.41	15/16	23.81	1.25	31.75	2.05	52.07	.96	24.4	.90	22.9
3/4	19.05	1/4	6.35	.19	4.82	1-1/16	26.98	1.25	31.75	1.94	49.28	.96	24.4	.60	15.2
3/4	19.05	3/8	9.52	.28	7.11	1-1/16	26.98	1.31	33.27	2.00	50.80	.96	24.4	.66	16.8
3/4	19.05	1/2	12.70	.41	10.41	1-1/16	26.98	1.31	33.27	2.11	53.59	.96	24.4	.90	22.9
3/4	19.05	5/8	15.87	.50	12.70	1-1/16	26.98	1.31	33.27	2.11	53.59	.96	24.4	.96	24.4
1	25.4	1/2	12.70	.41	10.41	1-3/8	34.92	1.61	38.10	2.38	60.45	1.23	31.2	.90	22.9
1	25.4	3/4	19.05	.62	15.75	1-3/8	34.92	1.59	38.10	2.38	60.45	1.23	31.2	.96	24.4

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UNION TEE



764 L Union Tee - All Tube (Metric)

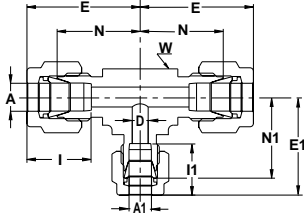
A Tube O.D. mm	D mm	W Width Across Hex. mm in		N mm	E mm	I mm
2	1.7	9.5	3/8	15.7	22.3	12.9
3	2.4	9.5	3/8	15.7	22.3	12.9
4	2.4	12.7	1/2	18.8	25.4	13.7
6	4.8	12.7	1/2	19.6	27.0	15.3
8	6.4	16.0	5/8	22.4	29.9	16.2
10	7.9	20.5	11/16	23.9	31.5	17.2
12	9.5	20.5	13/16	25.9	36.0	22.8
14	11.1	24.0	15/16	28.7	38.8	24.4
15	11.9	25.0	15/16	28.7	38.8	24.4
16	12.7	25.0	15/16	28.7	38.8	24.4
18	15.1	27.0	1-1/8	29.7	39.8	24.4
20	15.9	30.0	1-3/8	34.5	44.6	26.0
22	18.3	30.0	1-3/8	34.5	44.6	26.0
25	21.8	35.0	1-3/8	36.8	49.1	31.3

764 L Union Tee - All Tube (Inch)

A Tube O.D.		D		W Width Across Hex.		N	E		I		
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/16	1.58	.05	1.27	3/8	9.52	.56	14.22	.70	17.8	.34	8.6
1/8	3.17	.09	2.28	1/2	12.7	.62	15.74	.88	22.35	.50	12.7
3/16	4.76	.12	3.04	1/2	12.70	.70	17.8	.96	24.4	.54	13.7
1/4	6.35	.19	4.82	1/2	12.70	.77	19.55	1.06	26.9	.60	15.2
5/16	7.93	.25	6.35	5/8	15.87	.88	22.35	1.17	29.71	.64	16.3
3/8	9.52	.28	7.11	5/8	15.87	.91	23.11	1.20	30.48	.66	16.8
1/2	12.70	.41	10.41	13/16	20.63	1.02	25.9	1.42	30.1	.90	22.9
5/8	15.87	.50	12.70	15/16	23.81	1.13	28.7	1.53	38.9	.96	24.4
3/4	19.05	.62	15.74	1-1/8	28.6	1.17	29.7	1.57	39.9	.96	24.4
1	25.40	.88	22.35	1-3/8	34.9	1.45	36.8	1.93	49.0	1.23	31.2
*1-1/4	31.75	1.09	27.7	1-11/16	42.9	1.75	44.5	2.62	66.5	1.62	41.1
*1-1/2	38.1	1.34	34.0	2	50.8	2.00	50.8	3.07	78.0	1.97	50.0

*Including low friction paste, See page 5
 "D" - Dimension is minimum opening.
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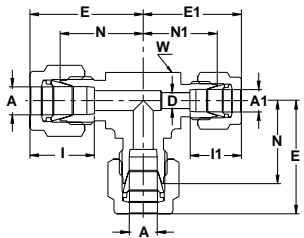
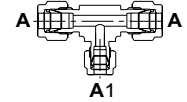
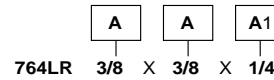
REDUCING UNION TEE



764 LR Reducing Tee

A TUBE O.D.	A1 TUBE O.D.	E	E1	I	I1	D MIN OPENING	W WRENCH FLAT	N	N1
inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm
3/8 9.52	1/4 6.35	1.20 30.5	1.14 29.0	0.66 16.8	0.60 15.2	0.19 4.8	5/8 15.9	0.91 23.1	0.85 21.6
1/2 12.70	1/4 6.35	1.42 36.1	1.25 31.8	0.90 22.9	0.60 15.2	0.19 4.8	13/16 20.6	1.02 25.9	0.96 24.4
1/2 12.70	3/8 9.52	1.42 36.1	1.31 33.3	0.90 22.9	0.66 16.8	0.28 7.1	13/16 20.6	1.02 25.9	1.02 25.9
5/8 15.88	3/8 9.52	1.53 38.9	1.42 36.1	0.96 24.4	0.66 16.8	0.28 7.1	15/16 23.8	1.13 28.7	1.13 28.7
3/4 19.05	3/8 9.52	1.57 39.9	1.46 37.1	0.96 24.4	0.66 16.8	0.28 7.1	1-1/8 28.6	1.17 29.7	1.17 29.7
3/4 19.05	1/2 12.70	1.57 39.9	1.57 39.9	0.96 24.4	0.90 22.9	0.41 10.4	1-1/8 28.6	1.17 29.7	1.17 29.7
1 25.4	3/8 9.52	1.93 49.0	1.65 41.9	1.23 31.2	0.66 16.8	0.28 7.1	1-3/8 34.9	1.45 36.8	1.36 34.5
1 25.4	1/2 12.70	1.93 49.0	1.76 44.7	1.23 31.2	0.90 22.9	0.41 10.4	1-3/8 34.9	1.45 36.8	1.36 34.5
1 25.4	3/4 19.05	1.93 49.0	1.76 44.7	1.23 31.2	0.96 24.4	0.62 15.8	1-3/8 34.9	1.45 36.8	1.36 34.5

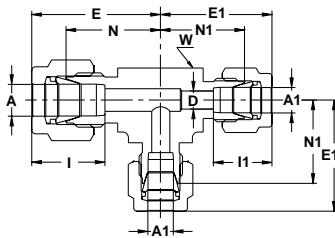
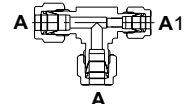
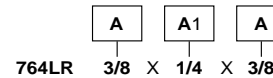
HOW TO ORDER



764 LR

A TUBE O.D.	A1 TUBE O.D.	E	E1	I	I1	D MIN OPENING	W WRENCH FLAT	N	N1
inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm
3/8 9.52	1/4 6.35	1.20 30.5	1.14 29.0	0.66 16.8	0.60 15.2	0.19 4.8	5/8 15.9	0.91 23.1	0.85 21.6

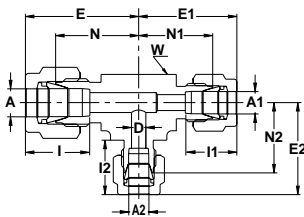
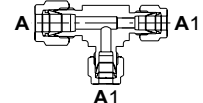
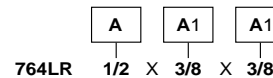
HOW TO ORDER



764 LR

A TUBE O.D.	A1 TUBE O.D.	E	E1	I	I1	D MIN OPENING	W WRENCH FLAT	N	N1
inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm
1/2 12.70	3/8 9.52	1.42 36.1	1.31 33.3	0.90 22.9	0.66 16.8	0.28 7.1	13/16 20.6	1.02 25.9	1.02 25.9
5/8 15.88	3/8 9.52	1.53 38.9	1.42 36.1	0.96 24.4	0.66 16.8	0.28 7.1	15/16 23.8	1.13 28.7	1.13 28.7
3/4 19.05	3/8 9.52	1.57 39.9	1.46 37.1	0.96 24.4	0.66 16.8	0.28 7.1	1-1/8 28.6	1.17 29.7	1.17 29.7

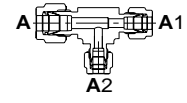
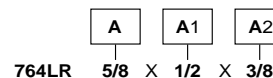
HOW TO ORDER



764 LR

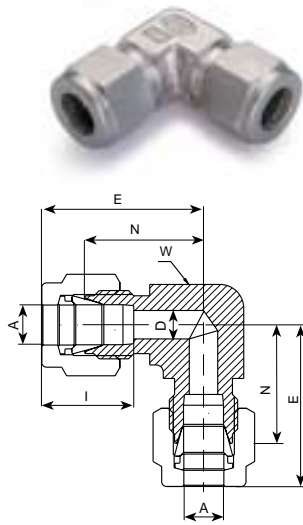
A TUBE O.D.	A1 TUBE O.D.	A2 TUBE O.D.	E	E1	E2	I	I1	I2	D MIN OPENING	W WRENCH FLAT	N	N1&N2
inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm
5/8 15.88	1/2 12.70	3/8 9.52	1.53 38.9	1.53 38.9	1.42 36.1	0.96 24.4	0.90 22.9	0.66 16.8	0.28 7.1	15/16 23.8	1.13 28.7	1.13 28.7
3/4 19.05	1/2 12.70	3/8 9.52	1.57 39.9	1.57 39.9	1.46 37.1	0.96 24.4	0.90 22.9	0.66 16.8	0.28 7.1	1-1/8 28.6	1.17 29.7	1.17 29.7
1 25.4	3/4 19.05	3/8 9.52	1.93 49.0	1.76 44.7	1.65 41.9	1.23 31.2	0.96 24.4	0.66 16.8	0.28 7.1	1-3/8 34.9	1.45 36.8	1.36 34.5

HOW TO ORDER



"D" - Dimension is minimum opening.
Dimensions are for reference only, and are subject to change without notice.

UNION ELBOW



765 L Union Elbow - Tube (Metric) to Tube (Metric)

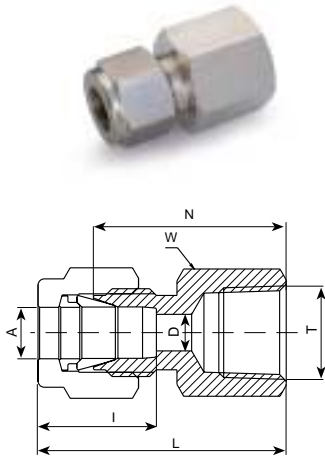
A Tube O.D. mm	D mm	W Width Across Hex. mm in		N mm	E mm	I mm
		mm	in			
3	2.4	9.5	3/8	15.7	22.3	12.9
4	2.4	11.1	7/16	18.8	25.4	13.7
6	4.8	12.5	1/2	19.6	27.0	15.3
8	6.4	16.0	5/8	21.3	28.8	16.2
10	7.9	17.5	11/16	23.9	31.5	17.2
12	9.5	20.6	13/16	25.9	36.0	22.8
14	11.1	24.0	15/16	27.9	38.1	24.4
15	11.9	24.0	15/16	27.9	38.8	24.4
16	12.7	24.0	15/16	27.9	38.0	24.4
18	15.1	28.6	1-1/8	29.7	39.8	24.4
20	15.9	35	1-3/8	34.5	44.6	26.0
22	18.3	35	1-3/8	34.5	44.6	26.0
25	21.8	35.0	1-3/8	36.8	49.1	31.3

765 L Union Elbow - Tube (Inch) to Tube (Inch)

A Tube O.D.		D		W Width Across Hex.		N		E		I	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/8	3.17	.09	2.28	3/8	9.52	.62	15.74	.88	22.35	.50	12.7
3/16	4.76	.12	3.04	1/2	12.70	.75	19.05	1.01	25.65	.54	13.7
1/4	6.35	.19	4.82	1/2	12.70	.77	19.56	1.06	26.92	.60	15.2
5/16	7.93	.25	6.35	5/8	15.87	.84	21.33	1.13	28.7	.64	16.3
3/8	9.52	.28	7.11	5/8	15.87	.91	23.11	1.20	30.48	.66	16.8
1/2	12.70	.41	10.41	13/16	20.63	1.02	25.90	1.42	36.06	.90	22.9
5/8	15.87	.50	12.70	15/16	23.81	1.10	27.94	1.50	38.1	.96	24.4
3/4	19.05	.62	15.74	1-1/8	28.6	1.17	29.71	1.57	39.89	.96	24.4
7/8	22.22	.72	18.28	1-3/16	30.2	1.36	34.5	1.76	44.7	1.02	25.9
1	25.40	.88	22.35	1-3/8	34.92	1.45	36.83	1.93	49	1.23	31.3
*1-1/4	31.75	1.09	27.7	1-11/16	42.9	1.75	44.5	2.62	66.5	1.62	41.1
*1-1/2	38.10	1.34	34.0	2	50.8	2.00	50.8	3.07	78.0	1.97	50.0

*Including low friction paste, See page 5
 "D" - Dimension is minimum opening.
 Dimensions are for reference only, and are subject to change without notice.

FEMALE CONNECTOR



766 L Female Connector - Tube (Metric) to Female NPT Thread

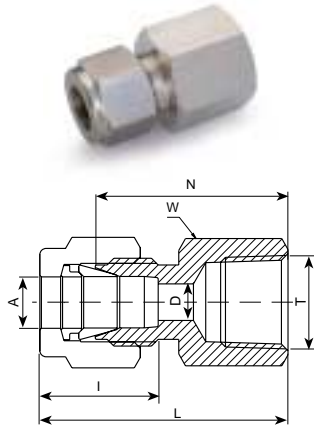
A Tube O.D. mm	T (NPT) in	D mm	W Width Across Hex. mm	N mm	L mm	I mm
3	1/8	2.4	14	22.1	28.7	12.7
3	1/4	2.4	19	26.9	33.5	12.7
4	1/8	2.4	14	23.1	29.7	13.7
6	1/8	4.8	14	23.9	31.3	15.3
6	1/4	4.8	19	28.4	35.8	15.3
6	3/8	4.8	22	30.2	37.6	15.3
6	1/2	4.8	27	35.1	42.5	15.3
8	1/8	6.4	15	24.6	32.1	16.2
8	1/4	6.4	19	29.5	37.0	16.2
8	3/8	6.4	22	31.0	38.5	16.2
8	1/2	6.4	27	35.8	43.3	16.2
10	1/4	7.9	19	30.2	37.8	17.2
10	3/8	7.9	22	31.8	39.4	17.2
10	1/2	7.9	27	36.6	44.2	17.2
12	1/4	9.5	22	30.2	40.3	22.8
12	3/8	9.5	22	31.8	41.9	22.8
12	1/2	9.5	27	36.6	46.7	22.8
15	1/2	11.9	27	36.6	46.7	24.4
16	1/2	12.7	27	36.8	46.9	24.4
20	1/2	15.9	30	37.8	47.9	26.0
20	3/4	15.9	35	39.6	49.7	26.0
22	3/4	18.3	35	39.6	49.7	26.0
22	1	18.3	41	47.8	57.9	26.0
25	3/4	21.8	35	41.1	53.4	31.3
25	1	21.8	41	50.0	62.3	31.3

766 L Female Connector - Tube (Inch) to Female NPT Thread

A Tube O.D. in	T (NPT) in	D in	W Width Across Hex. in	N in	L in	I in						
1/8	3.17	1/8	.09	2.28	9/16	14.28	.88	22.35	1.14	28.95	.50	12.7
1/8	3.17	1/4	.09	2.28	3/4	19.05	1.06	26.92	1.32	33.52	.50	12.7
3/16	4.76	1/8	.12	3.04	9/16	14.28	.91	23.11	1.17	29.71	.54	13.7
1/4	6.35	1/8	.19	4.82	9/16	14.28	.94	23.87	1.23	31.24	.60	15.2
1/4	6.35	1/4	.19	4.82	3/4	19.05	1.12	28.44	1.41	35.81	.60	15.2
1/4	6.35	3/8	.19	4.82	7/8	22.22	1.19	30.22	1.48	37.59	.60	15.2
1/4	6.35	1/2	.19	4.82	1-1/16	26.98	1.38	35.0	1.67	42.42	.60	15.2
5/16	7.93	1/8	.25	6.35	9/16	14.28	.97	24.63	1.26	32.00	.64	16.3
5/16	7.93	1/4	.25	6.35	3/4	19.05	1.16	29.46	1.45	36.83	.64	16.3
3/8	9.52	1/8	.28	7.11	5/8	15.87	1.00	25.40	1.29	32.76	.66	16.8
3/8	9.52	1/4	.28	7.11	3/4	19.05	1.19	30.22	1.48	37.59	.66	16.8
3/8	9.52	3/8	.28	7.11	7/8	22.22	1.25	31.75	1.54	39.11	.66	16.8
3/8	9.52	1/2	.28	7.11	1-1/16	26.98	1.44	36.57	1.73	43.94	.66	16.8
1/2	12.70	1/4	.41	10.41	13/1	20.63	1.19	30.2	1.59	40.38	.90	22.9
1/2	12.70	3/8	.41	10.41	67/8	22.22	1.25	31.75	1.65	41.91	.90	22.9
1/2	12.70	1/2	.41	10.41	1-1/16	26.98	1.44	36.57	1.84	46.73	.90	22.9
1/2	12.70	3/4	.41	10.41	1-5/16	33.33	1.50	38.10	1.90	48.26	.90	22.9
5/8	15.87	3/8	.50	12.70	15/16	23.81	1.25	31.75	1.65	41.91	.90	24.4
5/8	15.87	1/2	.50	12.70	1-1/16	26.98	1.44	36.57	1.84	46.73	.86	24.4
3/4	19.05	1/2	.62	15.74	1-1/16	26.98	1.44	36.57	1.84	46.73	.86	24.4
3/4	19.05	3/4	.62	15.74	1-5/16	33.33	1.50	38.10	1.90	48.26	.86	24.4
7/8	22.22	3/4	.72	18.28	1-5/16	33.33	1.56	39.62	1.96	49.78	1.02	25.9
1	25.40	3/4	.88	22.35	1-3/8	34.92	1.62	41.14	2.10	53.34	1.23	31.2
1	25.40	1	.88	22.35	1-5/8	41.27	1.97	50.03	2.45	62.23	1.23	31.2

"D" - Dimension is minimum opening.
Dimensions are for reference only, and are subject to change without notice.

FEMALE CONNECTOR



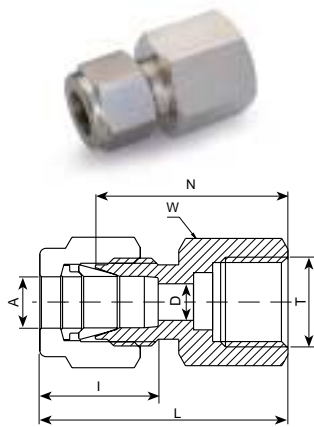
**Reference Specifications:
Normen:**

- DIN - 2999
- BS - 21
- JIS - B0203
- ISO - 7/1-BSP-T

766 LR Female Connector - Tube (Metric) to Female ISO Tapered Thread

A Tube O.D.	T (ISO)	D	W Width Across Hex.	N	L	I
mm	inch	mm	mm	mm	mm	mm
3	R-1/8	2.4	14	22.1	28.7	12.9
6	R-1/8	4.8	14	23.9	31.3	15.3
6	R-1/4	4.8	19	28.4	35.8	15.3
6	R-3/8	4.8	22	30.2	37.6	15.3
6	R-1/2	4.8	27	35.1	42.5	15.3
8	R-1/8	6.4	15	24.6	32.1	16.2
8	R-1/4	6.4	19	29.5	37.0	16.2
8	R-3/8	6.4	22	31.0	38.5	16.2
8	R-1/2	6.4	27	35.8	43.3	16.2
10	R-1/8	7.9	18	25.4	33.0	17.2
10	R-1/4	7.9	19	30.2	37.8	17.2
10	R-3/8	7.9	22	31.8	39.4	17.2
10	R-1/2	7.9	27	36.6	44.2	17.2
12	R-1/8	8.3	22	25.4	35.5	22.8
12	R-1/4	9.5	22	30.2	40.3	22.8
12	R-3/8	9.5	22	31.8	41.9	22.8
12	R-1/2	9.5	27	36.6	46.7	22.8
12	R-3/4	9.5	35	38.9	49.0	22.8
15	R-3/8	11.9	24	31.8	41.9	24.4
15	R-1/2	11.9	27	36.6	46.4	24.4
20	R-1/2	15.9	30	37.8	47.9	26.0
20	R-3/4	15.9	35	39.6	49.7	26.0
22	R-3/4	18.3	35	39.6	49.7	26.0
22	R-1	18.3	41	47.8	57.9	26.0
25	R-3/4	21.8	35	41.1	53.4	31.3
25	R-1	21.8	41	50.0	62.3	31.3

FEMALE CONNECTOR



766 LG Female Connector - Tube (Metric) to Female ISO Parallel Thread

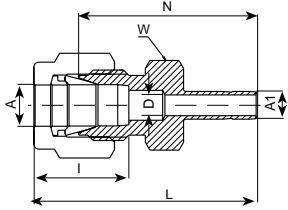
A Tube O.D.	T (ISO)	D	W Width Across Hex	N	L	I
mm	inch	mm	mm	mm	mm	mm
3	G-1/4	2.4	19	28.7	35.3	12.9
6	G-1/4	4.8	19	30.2	37.6	15.3
6	G-3/8	4.8	24	30.2	37.6	15.3
6	G-1/2	4.8	27	36.1	43.5	15.3
8	G-1/4	5.5	19	31.0	38.5	16.2
8	G-3/8	6.5	24	28.7	36.2	16.2
8	G-1/2	7.0	27	33.5	41	16.2
10	G-1/4	5.5	19	31.8	39.4	17.2
10	G-3/8	6.5	24	31.2	38.8	17.2
10	G-1/2	7.0	27	34.5	42.1	17.2
12	G-1/4	5.5	22	31.8	41.9	22.8
12	G-3/8	6.5	24	34.3	44.4	22.8
12	G-1/2	7.0	27	38.1	48.2	22.8
20	G-1/2	7.0	30	44.2	54.3	26.0
22	G-1/2	7.0	30	44.2	54.3	26.0

Reference Specifications:

- Normen:**
- DIN - ISO 228/1
 - BS - 2779
 - JIS - B0202
 - ISO - 228/1-BSP-P

"D" - Dimension is minimum opening.
Dimensions are for reference only, and are subject to change without notice.

REDUCER

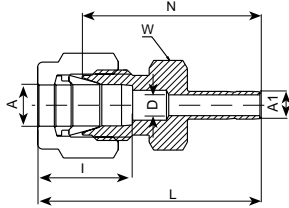


767 LT Reducer - Tube (Metric) to Stub (Metric)

A Tube O.D. mm	Tube O.D. mm	D mm	W Width Across Hex. mm	N mm	L mm	I mm
2	3	1.7	12	26.9	33.5	12.9
3	4	2.4	12	28.4	35.0	12.9
3	6	2.4	12	29.5	36.1	12.9
3	10	2.4	14	31.8	38.4	12.9
4	6	2.4	12	30.5	37.1	13.7
6	3	1.8	14	29.5	36.9	15.3
6	8	4.8	14	32.5	39.9	13.7
6	10	4.8	14	33.3	40.7	15.3
6	12	4.8	14	38.9	46.3	15.3
6	18	4.8	22	42.2	49.6	15.3
8	6	4.6	15	32.8	40.3	15.3
8	10	6.4	15	34.5	42.0	15.3
8	12	6.4	15	40.1	47.6	16.2
10	6	4.6	18	34.8	42.4	16.2
10	8	6.4	18	35.8	43.4	17.2
10	12	7.9	18	42.2	49.8	17.2
10	15	7.9	18	43.7	51.3	17.2
10	18	7.9	22	43.7	51.3	17.2
12	6	4.6	22	34.8	44.9	17.2
12	10	7.7	22	36.6	46.7	22.8
12	16	9.5	22	43.7	53.8	22.8
12	18	9.5	22	43.7	53.8	22.8
12	20	9.5	22	46.0	56.1	22.8
12	22	9.5	24	46.0	56.1	22.8
12	25	9.5	27	52.3	62.4	22.8
16	12	9.1	24	42.9	53.0	22.8
18	12	9.1	27	44.5	54.6	24.4
18	16	12.7	27	46.0	56.1	24.4
18	20	15.1	27	47.5	57.6	24.4
18	22	15.1	27	47.5	57.6	24.4
18	25	15.1	27	52.3	62.4	24.4
20	16	12.7	30	47.8	57.9	26.0
20	18	13.9	30	47.8	57.9	26.0
20	22	15.8	30	49.3	59.4	26.0
20	25	15.8	30	54.1	64.2	26.0
22	18	13.9	30	47.8	57.9	26.0
22	20	15.1	30	49.3	59.4	26.0
22	25	18.3	30	54.1	64.2	26.0
25	18	13.9	35	50.8	63.1	31.3
25	20	15.1	35	52.3	64.6	31.3

"D" - Dimension is minimum opening.
Dimensions are for reference only, and are subject to change without notice.

REDUCER



767 LT Reducer - Tube (Metric) to Stub (Inch)

A Tube O.D. mm	A ₁ Tube O.D. in	D mm	W Width Across Hex. mm	N mm	L mm	I mm
2	1/8	1.7	12	26.9	18.2	12.9
3	1/8	2.0	12	26.9	33.5	12.9
3	1/4	2.4	12	29.5	36.1	12.9
4	1/4	2.4	12	30.5	37.1	13.7
6	1/8	4.8	14	29.5	36.9	15.3
6	5/16	4.8	14	32.5	39.9	15.3
6	3/8	4.8	14	33.3	40.7	15.3
6	1/2	4.8	14	38.9	46.3	15.3
8	3/8	6.4	15	34.5	42.0	16.2
8	1/2	6.4	15	40.1	47.6	16.2
10	3/8	7.1	18	36.6	44.2	17.2
10	1/2	7.9	18	42.2	49.8	17.2
12	1/2	9.5	22	42.2	52.3	22.8
12	3/4	9.5	22	43.7	53.8	22.8
18	3/4	15.1	27	46.0	56.1	24.4
18	1	15.1	27	52.3	62.4	24.4
25	1	20.2	35	57.2	69.4	31.3

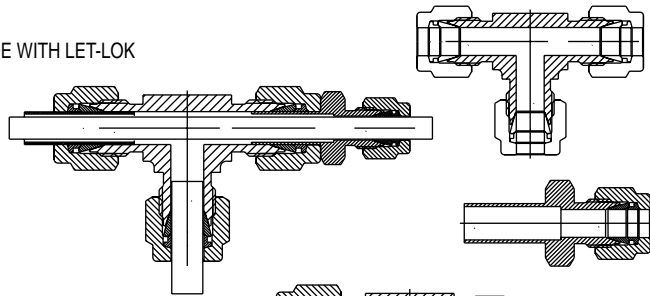
HEAT EXCHANGER TEE

How to order:

Option 1:

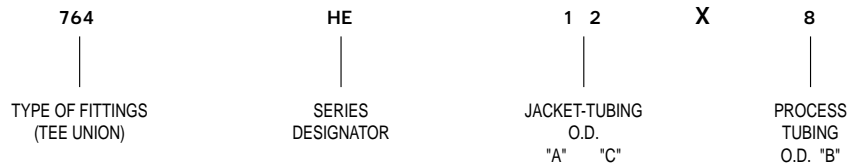
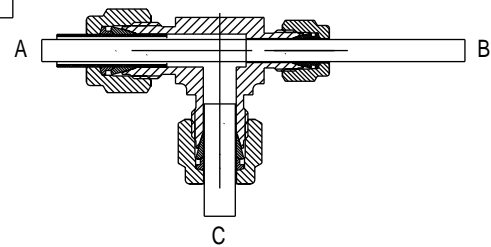
HEAT EXCHANGER TEE MADE WITH LET-LOK TUBE FITTINGS:

- A. TEE UNION - 764 L
- B. REDUCER - 767 LT



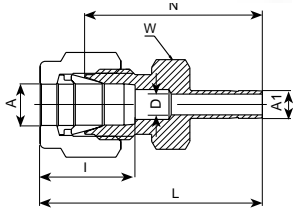
Option 2:

HEAT EXCHANGER TEE - ONE PIECE



"D" - Dimension is minimum opening.
Dimensions are for reference only, and are subject to change without notice.

REDUCER

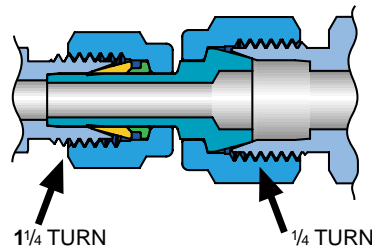


767 LT Reducer - Tube (Inch) to Stub (Inch)

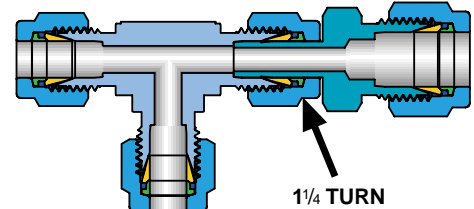
A		A1		D		W		N		L		I	
Tube O.D.		Tube O.D.				Width Across Hex.							
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/16	1.58	1/8	3.17	.05	1.27	5/16	7.93	1.00	25.40	1.15	29.21	.34	8.6
1/16	1.58	1/4	6.35	.05	1.27	5/16	7.93	1.09	27.68	1.24	31.50	.34	8.6
1/8	3.17	1/16	1.58	.03	0.76	7/16	11.11	0.88	22.35	1.14	28.96	.50	12.7
1/8	3.17	3/16	4.76	.09	2.28	7/16	11.11	1.09	27.68	1.35	34.29	.50	12.7
1/8	3.17	1/4	6.35	.09	2.28	7/16	11.11	1.16	29.46	1.42	36.06	.50	12.7
1/8	3.17	3/8	9.52	.09	2.28	7/16	11.11	1.22	30.98	1.48	37.59	.50	12.7
1/8	3.17	1/2	12.70	.09	2.28	9/16	14.28	1.48	37.59	1.74	44.20	.50	12.7
3/16	4.76	1/8	3.17	.08	2.03	7/16	11.11	1.11	28.19	1.37	34.80	.54	13.7
3/16	4.76	1/4	6.35	.12	3.04	7/16	11.11	1.20	30.48	1.46	37.08	.60	13.7
1/4	6.35	1/8	3.17	.08	2.03	1/2	12.70	1.16	29.46	1.45	36.83	.60	15.2
1/4	6.35	3/16	4.76	.12	3.04	1/2	12.70	1.19	30.22	1.48	37.59	.60	15.2
1/4	6.35	1/4	6.35	.19	4.82	1/2	12.70	1.25	31.75	1.54	39.11	.60	15.2
1/4	6.35	5/16	7.93	.19	4.82	1/2	12.70	1.28	32.51	1.57	39.87	.60	15.2
1/4	6.35	3/8	9.52	.19	4.82	1/2	12.70	1.31	33.27	1.60	40.64	.60	15.2
1/4	6.35	1/2	12.70	.19	4.82	9/16	14.28	1.53	38.86	1.82	46.22	.60	15.2
1/4	6.35	5/8	7.93	.19	4.82	11/16	17.46	1.60	40.64	1.89	48.00	.60	15.2
1/4	6.35	3/4	19.05	.19	4.82	13/16	20.63	1.59	40.39	1.88	47.75	.60	15.2
5/16	7.93	3/8	9.52	.25	6.35	9/16	14.28	1.36	34.54	1.65	41.91	.64	16.3
5/16	7.93	1/2	12.70	.25	6.35	9/16	14.28	1.58	40.13	1.87	47.49	.64	16.3
3/8	9.52	1/4	6.35	.19	4.22	5/8	15.87	1.34	34.03	1.63	41.40	.66	16.8
3/8	9.52	3/8	9.52	.28	7.11	5/8	15.87	1.41	35.81	1.70	43.18	.66	16.8
3/8	9.52	1/2	12.70	.28	7.11	5/8	15.87	1.62	41.14	1.91	48.51	.66	16.8
3/8	9.52	5/8	15.87	.28	7.11	11/16	17.46	1.69	42.92	1.98	50.29	.66	16.8
3/8	9.52	3/4	19.05	.28	7.11	13/16	20.63	1.69	42.92	1.98	50.29	.66	16.8
1/2	12.70	1/4	6.35	.19	4.82	13/16	20.63	1.37	34.80	1.77	44.96	.90	22.9
1/2	12.70	3/8	9.52	.28	7.11	13/16	20.63	1.44	36.58	1.84	46.74	.90	22.9
1/2	12.70	1/2	12.70	.39	9.91	13/16	20.63	1.66	42.16	2.06	52.32	.90	22.9
1/2	12.70	5/8	15.87	.41	10.41	13/16	20.63	1.72	43.68	2.12	53.84	.90	22.9
1/2	12.70	3/4	19.05	.41	10.41	13/16	20.63	1.72	43.68	2.12	53.84	.90	22.9
1/2	12.70	1	25.40	.41	10.41	1-1/16	26.98	1.97	50.03	2.37	60.19	.90	22.9
5/8	15.87	3/4	19.05	.50	12.70	15/16	23.81	1.75	44.45	2.15	54.61	.96	24.4
5/8	15.87	7/8	22.22	.50	12.70	15/16	23.81	1.81	45.97	2.21	56.13	.96	24.4
5/8	15.87	1	25.40	.50	12.70	1-1/16	26.98	2.00	50.80	2.40	60.96	.96	24.4
3/4	19.05	1/2	12.70	.39	9.91	1-1/16	26.98	1.75	44.45	2.15	54.61	.96	24.4
3/4	19.05	1	25.40	.62	15.75	1-1/16	26.98	2.06	52.32	2.46	62.48	.96	24.4
1	25.40	*1-1/4	31.75	.88	22.35	1-3/8	34.93	2.69	68.33	3.17	80.52	1.23	31.2
1	25.40	*1-1/2	38.10	.88	22.35	1-5/8	41.28	3.03	76.96	3.51	89.15	1.23	31.2
1-1/4	31.75	*1-1/2	38.1	1.09	27.7	1-3/4	44.90	3.23	82.00	4.10	104.1	1.62	41.10

ASSEMBLY INSTRUCTIONS

Reducing port connector 767LM

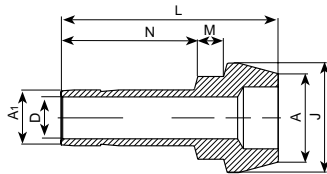


Reducer tube to stub 767 LT



* Supplied assembled on tube stub end (A1) Nut+Front & Back Ferrule. Tighten the Nut on body 1/2 a turn with wrench. low friction paste, See page 5.
 "D" - Dimension is minimum opening.
 Dimensions are for reference only, and are subject to change without notice.

REDUCING PORT CONNECTOR



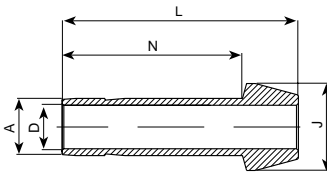
767 LM Reducing Port Connector - Connects Two LET-LOK® Ports

A Tube O.D.		A ₁ Tube O.D.		D		N		L		J		M	
mm		mm		mm		mm		mm		mm		mm	
6	3	2.2	13.5	22.6	9.0	3.2							
8	6	4.6	15.7	24.7	11.0	3.1							
10	6	4.6	15.7	25.0	13.1	3.4							
10	8	6.4	16.8	25.8	13.1	3.1							
12	6	4.6	15.7	29.1	15.0	3.6							
12	8	6.4	16.8	29.8	15.0	3.4							
12	10	7.7	17.5	30.4	15.0	3.1							
16	12	9.1	23.1	36.2	19.0	3.4							

767 LM Reducing Port Connector - Connects Two LET-LOK® Ports

A Tube O.D.		A ₁ Tube O.D.		D		N		L		J		M	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/8	3.17	1/16	1.58	.03	0.76	.34	8.64	.68	17.27	.24	6.10	.08	2.03
1/4	6.35	1/16	1.58	.03	0.76	.34	8.64	.71	18.03	.37	9.40	.14	3.55
1/4	6.35	1/8	3.17	.09	2.28	.53	13.46	.89	22.60	.37	9.40	.13	3.30
3/8	9.52	1/8	3.17	.09	2.28	.53	13.46	.91	23.11	.50	12.70	.15	3.81
3/8	9.52	1/4	6.35	.19	4.82	.62	15.75	.98	24.90	.50	12.70	.13	3.30
1/2	12.70	1/4	6.35	.19	4.82	.62	15.75	1.15	29.21	.62	15.75	.15	3.81
1/2	12.70	3/8	9.52	.28	7.11	.69	17.52	1.20	30.48	.62	15.75	.13	3.30
3/4	19.05	1/2	12.70	.39	9.90	.91	23.11	1.44	36.58	.87	22.10	.15	3.81

PORT CONNECTOR



767 LP Port Connector - Connects Two LET-LOK® Ports

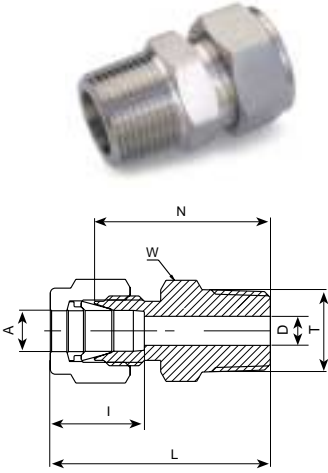
A Tube O.D.		D		N		L		J	
mm		mm		mm		mm		mm	
3	2.1	15.7	22.2	6.0					
6	4.4	18.7	24.6	9.0					
8	6.2	20.0	25.9	11.0					
10	8.2	20.2	26.1	13.1					
12	9.1	26.0	35.8	15.0					
16	12.7	27.6	37.4	19.0					
18	13.9	27.6	37.4	21.1					

767 LP Port Connector - Connects Two LET-LOK® Ports

A Tube O.D.		D		N		L		J	
in	mm	in	mm	in	mm	in	mm	in	mm
1/16	1.58	.03	0.76	.42	10.66	.54	13.72	.13	3.30
1/8	3.17	.09	2.28	.62	15.75	.88	22.35	.24	6.10
1/4	6.35	.19	4.82	.74	18.80	.97	24.64	.37	9.40
5/16	7.93	.25	6.35	.79	20.06	1.02	25.90	.43	10.92
3/8	9.52	.30	7.62	.80	20.32	1.03	26.16	.50	12.70
1/2	12.70	.39	9.90	1.02	25.90	1.41	35.81	.62	15.75
3/4	19.05	.59	14.58	1.09	27.68	1.47	37.34	.87	22.10
1	25.40	.80	20.32	1.36	34.54	1.90	48.26	1.12	28.45

"D" - Dimension is minimum opening.
 Assembly instructions - see page 19
 Dimensions are for reference only, and are subject to change without notice.

MALE CONNECTOR



768 L Male Connector - Tube (Metric) Male NPT Thread

A Tube O.D. mm	T (NPT) inch	D mm	W Width Across Hex. mm	N mm	L mm	I mm
3	1/8	2.4	12	23.9	30.5	12.9
3	1/4	2.4	14	29.0	35.6	12.9
4	1/8	2.4	12	24.6	31.2	13.7
4	1/4	2.4	14	29.7	36.3	13.7
6	1/8	4.8	14	25.4	32.8	15.3
6	1/4	4.8	14	30.5	37.9	15.3
6	3/8	4.8	18	31.0	38.4	15.3
6	1/2	4.8	22	37.3	44.7	15.3
8	1/8	4.8	15	26.7	34.2	16.2
8	1/4	6.4	15	31.2	38.7	16.2
8	3/8	6.4	18	31.8	39.3	16.2
8	1/2	6.4	22	31.8	45.6	16.2
10	1/8	4.8	18	28.7	36.3	17.2
10	1/4	7.9	18	33.3	40.9	17.2
10	3/8	7.9	18	33.3	40.9	17.2
10	1/2	7.9	22	38.1	46.5	17.2
10	3/4	7.9	27	40.4	48.0	19.5
12	1/8	4.8	22	28.7	38.8	22.8
12	1/4	7.1	22	33.3	43.4	22.8
12	3/8	9.5	22	33.3	43.4	22.8
12	1/2	9.5	22	30.9	49.0	22.8
12	3/4	9.5	27	40.4	50.5	22.8
14	1/4	7.1	24	34.0	44.1	22.8
14	3/8	9.5	24	34.0	44.1	22.8
14	1/2	11.1	24	38.9	49.0	22.8
15	1/2	11.9	24	38.9	49.0	24.4
16	3/8	9.5	24	34.0	44.1	24.4
16	1/2	11.9	24	38.9	49.0	24.4
16	3/4	12.7	27	40.4	50.5	24.4
18	1/2	11.9	27	40.4	50.5	24.4
18	3/4	15.1	27	40.4	50.5	24.4
20	1/2	11.9	30	42.2	52.3	26.0
20	3/4	15.9	30	42.2	52.3	26.0
22	3/4	15.9	30	42.2	52.3	26.0
22	1	18.3	35	47.0	57.1	26.0
25	1/2	11.9	35	45.2	57.5	31.3
25	3/4	15.9	35	45.2	57.5	31.3
25	1	21.8	35	50.0	62.3	31.3

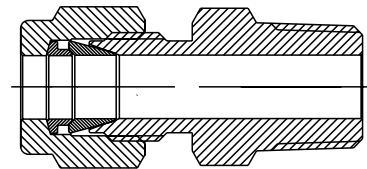
THERMOCOUPLE - CONNECTORS

Thermoelement

To order:

Use catalog number of the selected fitting and add suffix TC.

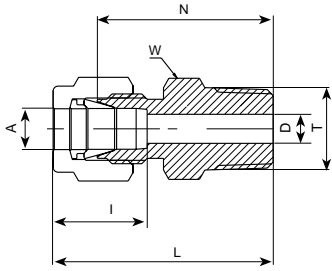
Example: 768 L ss 1/4 x 1/4 TC



"D" - Dimension is minimum opening.

Dimensions are for reference only, and are subject to change without notice.

MALE CONNECTOR



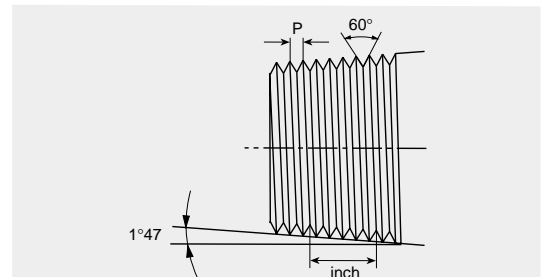
768 L Male Connector - Tube (Inch) Male NPT Thread

A Tube O.D.		T (NPT)		D		W Width Across Hex.		N		L		I	
in	mm	in	in	in	mm	in	mm	in	mm	in	mm	in	mm
1/16	1.58	1/16	.05	1.27	5/16	7.93	.78	19.81	.93	23.62	.34	8.6	
1/16	1.58	1/8	.05	1.27	7/16	11.11	.88	22.35	1.03	26.1	.34	8.6	
1/8	3.17	1/16	.09	2.28	7/16	11.11	.91	23.11	1.17	29.71	.50	12.7	
1/8	3.17	1/8	.09	2.28	7/16	11.11	.94	23.8	1.17	29.71	.50	12.7	
1/8	3.17	1/4	.09	2.28	9/16	14.28	1.14	28.95	1.40	35.56	.50	12.7	
3/16	4.76	1/8	.12	3.04	7/16	11.11	.97	24.53	1.23	31.24	.54	13.7	
3/16	4.76	1/4	.12	3.04	9/16	14.28	1.17	29.72	1.43	36.32	.54	13.7	
1/4	6.35	1/16	.12	3.04	1/2	12.70	1.00	25.40	1.29	32.76	.60	15.2	
1/4	6.35	1/8	.19	4.82	1/2	12.70	1.00	25.40	1.29	32.76	.60	15.2	
1/4	6.35	1/4	.19	4.82	9/16	14.28	1.20	30.50	1.49	37.85	.60	15.2	
1/4	6.35	3/8	.19	4.82	11/16	17.46	1.22	30.78	1.51	38.35	.60	15.2	
1/4	6.35	1/2	.19	4.82	7/8	22.22	1.47	37.34	1.76	44.70	.60	15.2	
5/16	7.93	1/8	.19	4.82	9/16	14.28	1.05	26.67	1.34	34.03	.64	16.2	
5/16	7.93	1/4	.25	6.35	9/16	14.28	1.23	31.24	1.52	38.60	.64	16.2	
3/8	9.52	1/8	.19	4.82	5/8	15.87	1.10	27.90	1.38	35.05	.66	16.8	
3/8	9.52	1/4	.28	7.11	5/8	15.87	1.28	32.51	1.57	39.87	.66	16.8	
3/8	9.52	3/8	.28	7.11	11/16	17.46	1.28	32.51	1.57	39.87	.66	16.8	
3/8	9.52	1/2	.28	7.11	7/8	22.22	1.52	38.90	1.82	46.23	.66	16.8	
3/8	9.52	3/4	.28	7.11	1-1/16	26.98	1.59	40.38	1.88	47.75	.66	16.8	
1/2x1/8	12.70	1/8	.19	4.82	13/16	20.63	1.13	28.70	1.53	38.86	.90	22.9	
1/2	12.70	1/4	.28	7.11	13/16	20.63	1.31	33.27	1.71	43.43	.90	22.9	
1/2	12.70	3/8	.38	9.65	13/16	20.63	1.31	33.27	1.71	43.43	.90	22.9	
1/2	12.70	1/2	.41	10.41	7/8	22.22	1.53	38.90	1.93	49.02	.90	22.9	
1/2	12.70	3/4	.41	10.41	1-1/16	26.98	1.59	40.38	1.99	50.54	.96	22.9	
1/2x1	12.70	1	.41	10.41	1 3/8	34.92	1.85	47.00	2.25	57.15	.96	22.9	
5/8	15.87	3/8	.38	9.65	15/16	23.81	1.34	34.03	1.74	44.19	.96	24.4	
5/8	15.87	1/2	.47	11.90	15/16	23.81	1.53	38.86	1.93	49.02	.96	24.4	
5/8	15.87	3/4	.50	12.70	1-1/16	26.98	1.59	40.38	1.99	50.54	.96	24.4	
3/4	19.05	1/2	.50	12.70	1-1/16	26.98	1.59	40.38	1.99	50.54	.96	24.4	
3/4	19.05	3/4	.62	15.74	1-1/16	26.98	1.59	40.38	1.99	50.54	.96	24.4	
3/4	19.05	1	.62	15.74	13/8	34.92	1.85	47.00	2.25	57.15	.96	24.4	
7/8	22.22	3/4	.72	18.28	1-3/16	30.16	1.59	40.38	1.99	50.54	1.02	25.9	
1	25.40	3/4	.72	18.28	1-3/8	34.92	1.78	45.21	2.26	57.40	1.23	31.2	
1	25.40	1	.88	22.35	1-3/8	34.92	1.97	50.03	2.45	62.23	1.23	31.2	

Reference Specifications: Normen:

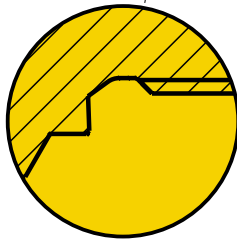
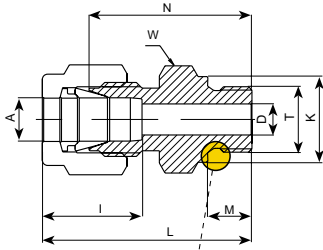
- 60° Thread angle
- Pitch measured in inches
- Truncation of root and crest are flat
- Taper angle 1° 47'

American Standard Pipe Thread (NPT). NPT (National Pipe Tapered) is made to specifications outlined in ASNI B1.20.1



"D" - Dimension is minimum opening.
Dimensions are for reference only, and are subject to change without notice.

MALE CONNECTOR



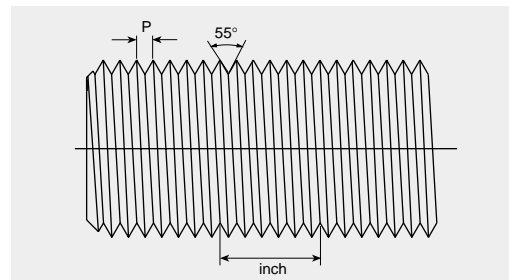
768 LG Male Connector ISO Parallel Thread

A Tube O.D. mm	T (ISO) in	D mm	K mm	W Width Across Hex. mm	N mm	M mm	L mm	I mm
2	G-1/8	1.7	13.8	14.0	23.4	7.1	30.0	12.9
3	G-1/8	2.4	13.8	14.0	23.4	7.1	30.0	12.9
3	G-1/4	2.4	18.0	19.0	28.7	11.2	35.3	12.9
4	G-1/8	2.4	13.8	14.0	24.1	7.1	30.7	13.7
6	G-1/8	4.0	13.8	14.0	24.9	7.1	24.9	15.3
6	G-1/4	4.8	18.0	19.0	30.2	11.2	37.6	15.3
6	G-3/8	4.8	21.8	22.0	31.5	11.2	38.9	15.3
6	G-1/2	4.8	26.0	27.0	37.3	14.2	44.7	15.3
8	G-1/8	4.0	13.8	15.0	25.7	7.1	33.2	16.2
8	G-1/4	6.4	13.8	19.0	31.0	11.2	38.5	16.2
8	G-3/8	6.4	21.8	22.0	32.3	11.2	39.8	16.2
8	G-1/2	6.4	26.0	27.0	38.1	14.2	45.6	16.2
10	G-1/4	5.9	18.0	19.0	31.8	11.2	39.4	17.2
10	G-3/8	7.9	21.8	22.0	33.0	11.2	40.6	17.2
10	G-1/2	7.9	26.0	27.0	38.9	14.2	46.5	17.2
12	G-1/4	5.9	18.0	22.0	32.5	11.2	42.6	22.8
12	G-3/8	7.9	21.8	22.0	33.0	11.2	43.1	22.8
12	G-1/2	9.5	26.0	27.0	38.9	14.2	49.0	22.8
12	G-3/4	9.5	32.0	35.0	42.7	15.7	52.8	22.8
16	G-3/8	7.9	21.8	24.0	33.8	11.2	43.9	24.4
16	G-1/2	11.9	26.0	27.0	38.9	14.2	49.0	24.4
18	G-1/2	11.9	26.0	27.0	38.9	14.2	49.0	24.4
18	G-3/4	15.1	32.0	35.0	42.7	15.7	52.8	24.4
20	G-1/2	11.9	26.0	30.0	40.4	14.2	50.5	26.0
20	G-3/4	15.9	32.0	35.0	42.7	15.7	52.8	26.0
22	G-3/4	15.9	32.0	35.0	42.7	15.7	52.8	26.0
22	G-1	18.3	39.0	41.0	45.2	18.3	55.3	26.0
25	G-3/4	15.9	32.0	35.0	45.2	15.7	57.5	31.3
25	G-1	19.8	39.0	41.0	47.8	18.3	60.1	31.3

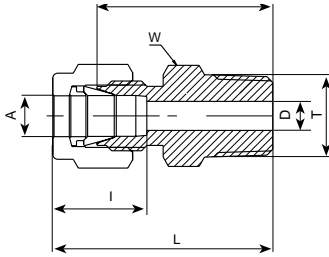
Reference Specifications:

- DIN - ISO 228/1
- BS - 2779
- JIS - BO202
- ISO - 228/1-BSP-P

- 55° Thread angle
- Pitch measured in inches
- Truncation of root and crest are round
- Diameter measured in inches



"D" - Dimension is minimum opening.
Dimensions are for reference only, and are subject to change without notice.

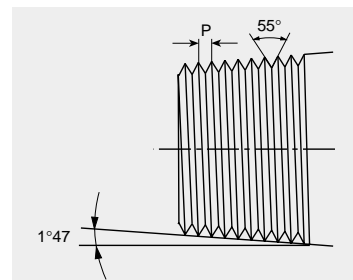
MALE CONNECTOR**768 LR Male Connector ISO Tapered Thread**

A Tube O.D. mm	T (ISO) in	D mm	W Width Across Hex. mm	N mm	L mm	I mm
2	R-1/8	1.7	12	23.9	30.5	12.9
3	R-1/8	2.4	12	23.9	30.5	12.9
3	R-1/4	2.4	14	29.0	35.6	12.9
4	R-1/8	2.4	12	24.6	31.2	13.7
4	R-1/4	2.4	14	29.7	36.3	15.3
6	R-1/8	4.8	14	25.4	32.8	15.3
6	R-1/4	4.8	14	30.5	37.9	15.3
6	R-3/8	4.8	18	31.0	38.4	15.3
6	R-1/2	4.8	22	37.3	44.7	15.3
8	R-1/8	4.8	15	26.7	34.2	16.2
8	R-1/4	6.4	15	31.2	38.7	16.2
8	R-3/8	6.4	18	31.8	39.2	16.2
8	R-1/2	6.4	22	38.1	45.5	16.2
10	R-1/8	4.8	18	28.7	36.3	17.2
10	R-1/4	7.9	18	33.3	40.9	17.2
10	R-3/8	7.9	18	33.3	40.9	17.2
10	R-1/2	7.9	22	38.9	46.5	17.2
12	R-1/4	7.1	22	33.3	43.4	22.8
12	R-3/8	9.5	22	33.3	43.4	22.8
12	R-1/2	9.5	22	38.9	49.0	22.8
12	R-3/4	9.5	27	40.4	50.5	22.8
15	R-1/2	11.9	24	38.9	49.0	24.4
16	R-1/4	7.1	24	34.0	44.1	24.4
16	R-3/8	9.5	24	34.0	44.1	24.4
16	R-1/2	11.9	24	38.9	49.0	24.4
16	R-3/4	12.7	27	40.4	50.5	24.4
18	R-1/2	11.9	27	40.4	50.5	24.4
18	R-3/4	15.1	27	40.4	50.5	24.4
20	R-1/2	11.9	30	42.2	52.3	26.0
20	R-3/4	15.9	30	42.2	52.3	26.0
22	R-3/4	15.9	30	42.2	52.3	26.0
22	R-1	18.3	35	47.0	57.1	26.0
25	R-3/4	15.9	35	45.2	57.5	31.3
25	R-1	21.8	35	50.0	62.3	31.3

Reference Specifications: Normen:

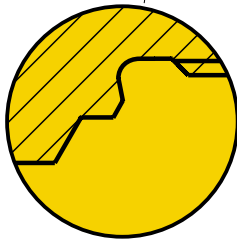
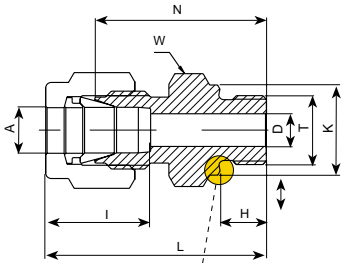
DIN - ISO 2999
 BS - 21
 JIS - BO203
 ISO - 7/1-BSP-T

- 55° Thread angle
- Pitch measured in millimeters
- Truncation of root and crest are round
- Taper angle 1°47'



"D" - Dimension is minimum opening.

Dimensions are for reference only, and are subject to change without notice.

MALE CONNECTOR

768 LOK Male Connector ISO Parallel Thread

A Tube O.D.	T (P-ISO)	D	K	W Width Across Hex.	H	N	L	I
mm	in	mm	mm	mm	mm	mm	mm	mm
3	G1/8A	2.4	13.8	14	7.1	23.4	30.0	12.9
3	G1/4A	2.4	18.0	19	11.2	28.7	35.3	12.9
4	G1/8A	2.4	13.8	14	7.1	24.1	30.7	13.7
6	G1/8A	4.0	13.8	14	7.1	24.9	32.3	15.3
6	G1/4A	4.8	18.0	19	11.2	30.2	37.6	15.3
6	G3/8A	4.8	21.8	22	11.2	31.5	38.9	15.3
6	G1/2A	4.8	26.0	27	14.2	37.3	44.7	15.3
8	G1/8A	4.0	13.8	15	7.1	25.7	33.2	16.2
8	G1/4A	6.4	18.0	19	11.2	31.0	38.5	16.2
8	G3/8A	6.4	21.8	22	11.2	32.3	39.8	16.2
8	G1/2A	6.4	26.0	27	14.2	38.1	45.6	16.2
10	G1/4A	5.9	18.0	19	11.2	31.8	39.4	17.2
10	G3/8A	7.9	21.8	22	11.2	33.0	40.6	17.2
10	G1/2A	7.9	26.0	27	14.2	38.9	46.5	19.5
12	G1/4A	5.9	18.0	22	11.2	32.5	42.6	17.2
12	G3/8A	7.9	21.8	22	11.2	33.0	43.1	22.8
12	G1/2A	9.5	26.0	27	14.2	38.9	49.0	22.8
12	G3/4A	9.5	32.0	35	15.7	42.7	52.8	22.8
15	G1/2A	11.9	26.0	27	14.2	38.9	49.0	22.8
16	G3/8A	7.9	21.8	24	11.2	33.8	43.9	22.4
16	G1/2A	11.9	26.0	27	14.2	38.9	49.0	22.4
18	G1/2A	11.9	26.0	27	14.2	38.9	49.0	22.4
18	G3/4A	15.1	32.0	35	15.7	42.7	52.8	22.4
20	G1/2A	11.9	26.0	30	14.2	40.4	50.5	26.0
20	G3/4A	15.9	32.0	35	15.7	42.7	52.8	26.0
22	G3/4A	15.9	32.0	35	15.7	42.7	52.8	26.0
22	G1A	18.3	39.0	40	18.3	45.2	55.3	26.0
25	G3/4A	15.9	32.0	35	15.7	45.2	57.5	31.3
25	G1A	19.8	39.0	40	18.3	47.8	60.1	31.3

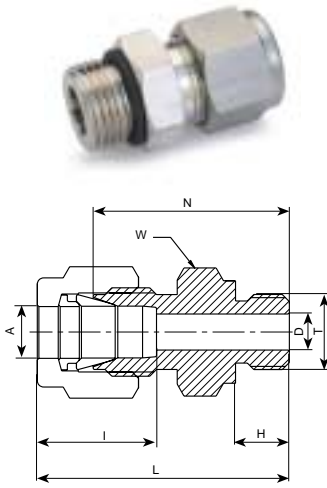
**Reference Specifications:
Normen:**

DIN - ISO 228/1
 BS - 2779
 JIS - BO202
 ISO - 228/1-BSP-P

"D" - Dimension is minimum opening.

Dimensions are for reference only, and are subject to change without notice.

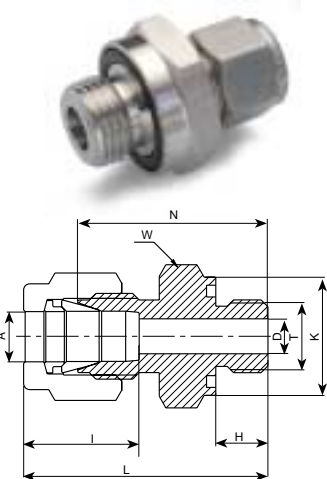
MALE CONNECTOR



768 LOB Male Connector SAE/MS Straight Thread Boss*

A Tube O.D.	T Straight Thread UN		D		W Width Across Hex		N		H		L		I		O-Ring**
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	
1/8	3.17	5/16-24	.09	2.28	7/16	11.11	0.92	23.37	.30	7.62	1.18	29.97	0.50	12.7	-902
1/4	6.35	7/16-20	.19	4.82	9/16	14.28	1.05	26.67	.36	9.14	1.34	34.03	0.60	15.2	-904
1/4	6.35	9/16-18	.19	4.82	11/16	17.46	1.11	28.19	.39	9.90	1.40	35.56	0.60	15.2	-906
1/4	6.35	3/4 -16	.19	4.82	7/8	22.22	1.18	29.97	.44	11.17	1.47	37.33	0.60	15.2	-908
1/4	6.35	7/8-14	.19	4.82	1	25.4	1.31	33.27	.50	12.70	1.60	40.64	0.60	15.2	-910
5/16	7.93	1/2-20	.25	6.4	5/8	15.87	1.08	27.43	.36	9.14	1.37	34.80	0.64	16.2	-905
3/8	9.52	7/16-20	.20	5.08	5/8	15.87	1.11	28.19	.36	9.14	1.40	35.56	0.66	16.8	-904
3/8	9.52	9/16-18	.28	7.11	11/16	17.46	1.17	29.71	.39	9.90	1.46	37.02	0.66	16.8	-906
3/8	9.52	3/4 -16	.28	7.11	7/8	22.22	1.25	31.75	.44	11.17	1.54	39.11	0.66	16.8	-908
3/8	9.52	7/8-14	.28	7.11	1	25.40	1.37	34.80	.50	12.70	1.66	42.16	0.66	16.8	-910
1/2	12.70	9/16-18	.28	7.11	13/16	20.63	1.14	28.95	.39	9.90	1.54	39.11	0.90	22.9	-906
1/2	12.70	3/4 -16	.41	10.41	7/8	22.22	1.25	31.75	.44	11.17	1.65	41.91	0.90	22.9	-908
1/2	12.70	7/8-14	.41	10.41	1	25.40	1.37	34.80	.50	12.70	1.77	44.96	0.90	22.9	-910
1/2	12.70	1-1/16-12	.41	10.41	1-1/4	31.75	1.53	38.86	.59	14.98	1.93	49.02	0.90	22.9	-912
5/8	15.87	3/4 -16	.42	10.66	15/16	23.81	1.25	31.75	.44	11.17	1.65	41.91	0.96	22.4	-908
5/8	15/87	7/8 -14	.50	12.70	1	25.40	1.38	35.05	.50	12.70	1.78	45.21	0.96	22.4	-910
3/4	19.05	3/4 -16	.42	10.66	1-1/16	26.98	1.41	35.81	.44	11.17	1.81	46.0	0.96	22.4	-908
3/4	19.05	1-1/16 -12	.62	15.74	1-1/4	31.75	1.53	38.86	.59	14.98	1.93	49.02	0.96	22.4	-912
7/8	22.22	1-3/16 -12	.72	18.29	1-3/8	34.92	1.53	38.86	.59	14.98	1.93	49.02	1.02	25.9	-914
1	25.40	1-1/16 -12	.66	16.76	1-3/8	34.92	1.63	41.40	.59	14.98	2.11	53.59	1.23	31.2	-912
1	25.40	1-5/16 -12	.88	22.35	1-1/2	38.10	1.66	42.16	.59	14.98	2.14	54.35	1.23	31.2	-916

MALE CONNECTOR



768 LOP O-Seal Male Connector NPT Tapered Thread

A Tube O.D.	T (NPT) Short	D		K		W Width Across Hex.		N		H		L		I		O-Ring***	
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm		
1/8	3.17	1/8	.09	2.28	.74	18.79	3/4	19.05	1.03	26.16	.28	7.11	1.29	32.76	.50	12.70	-111
1/4	6.35	1/8	.19	4.82	.74	18.79	3/4	19.05	1.10	27.94	.28	7.11	1.39	35.30	.60	15.24	-111
1/4	6.35	1/4	.19	4.82	.93	23.62	15/16	23.81	1.23	31.24	.38	9.65	1.52	38.60	.60	15.24	-113
3/8	9.52	1/4	.28	7.11	.93	23.62	15/16	23.81	1.28	32.51	.38	9.65	1.57	39.88	.66	16.76	-113
3/8	9.52	3/8	.28	7.11	1.12	28.45	1-1/8	28.57	1.34	34.04	.41	10.41	1.63	41.40	.66	16.76	-116
3/8	9.52	1/2	.28	7.11	1.30	33.02	1-5/16	33.33	1.56	39.62	.53	13.46	1.85	46.99	.66	16.76	-212
1/2	12.70	1/2	.41	10.41	1.30	33.02	1-5/16	33.33	1.56	39.62	.53	13.46	1.96	49.78	.90	22.86	-212

768 LO O-Seal Male UNF Thread

A Tube O.D.	T Straight Thread UNF	D		K		W Width Across Hex.		N		H		L		I		O-Ring***	
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm		
1/16	1.58	5/16-24	.05	1.27	.55	14.0	9/16	14.28	.90	22.86	.34	8.63	1.05	26.67	.34	8.63	-011
1/8	3.17	5/16-24	.09	2.28	.55	14.0	9/16	14.28	1.02	25.90	.34	8.63	1.28	32.51	.50	12.70	-011
3/16	4.76	3/8-24	.12	3.04	.62	15.75	5/8	15.87	1.10	27.94	.38	9.65	1.36	34.54	.54	13.72	-012
1/4	6.35	7/16-20	.19	4.22	.74	18.80	3/4	19.05	1.23	31.24	.41	10.41	1.52	38.60	.60	15.24	-111
5/16	7.93	1/2 -20	.25	6.35	.86	21.84	7/8	22.22	1.32	33.52	.44	11.17	1.61	40.89	.64	16.25	-112
3/8	9.52	9/16-18	.28	7.11	.93	23.62	15/16	23.81	1.38	35.05	.47	11.93	1.67	40.89	.66	16.76	-113
1/2	12.70	3/4 -16	.41	10.41	1.12	28.45	1-1/8	28.57	1.41	35.81	.47	11.93	1.81	45.77	.90	22.86	-116
3/4	19.05	1-1/16-12	.62	15.74	1.49	37.85	1-1/2	38.10	1.65	41.91	.56	14.22	2.05	52.07	.96	24.38	-215
1	25.40	1-5/16-12	.88	22.35	1.74	44.20	1-3/4	44.45	1.81	45.97	.56	14.22	2.29	58.17	1.23	31.24	-219

* Per SAE J1926 and MS 16142. See page 45 for mounting dimensions.

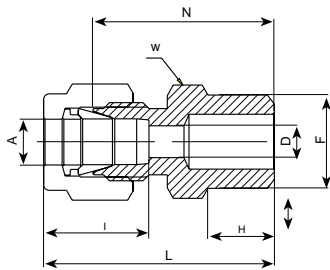
** O-rings used are Viton 90 Durometer. Other O-ring materials are available on request. For more technical information see page 45.

*** O-rings used are BUNA 70 Durometer.

"D" - Dimension is minimum opening.

Dimensions are for reference only, and are subject to change without notice.

MALE PIPE WELD CONNECTOR



768 LN Male Pipe Weld Connector - Tube (Metric)

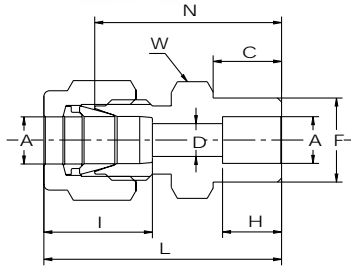
A Tube O.D. mm	F Pipe Size mm	D mm	W Width Across Hex. mm		N mm	H mm	L mm	I mm
3	10.3	2.4	12	23.1	9.7	30.5	12.9	
4	10.3	2.4	12	24.1	9.7	31.2	13.7	
6	10.3	4.8	14	25.4	9.7	32.8	15.3	
6	13.7	4.8	14	30.2	14.2	37.9	15.3	
8	10.3	5.1	15	26.7	9.7	34.2	16.2	
8	13.7	6.4	15	31.2	14.2	38.7	16.2	
8	21.3	6.4	22	37.3	19.0	45.6	16.2	
10	13.7	7.1	18	33.3	14.2	40.9	17.2	
10	17.1	7.9	18	32.5	14.2	40.9	17.2	
10	21.3	7.9	22	38.1	19.0	46.5	17.2	
12	13.7	7.1	22	33.3	14.2	43.4	22.8	
12	17.1	9.5	22	33.3	14.2	43.4	22.8	
12	21.3	9.5	22	38.1	19.0	49.0	22.8	
15	21.3	11.9	24	38.9	19.0	49.0	24.4	
16	21.3	12.7	24	38.9	19.0	49.0	24.4	
18	21.3	13.5	27	40.4	19.0	50.5	24.4	

768 LN Male Pipe Weld Connector - Tube (Inch)

A Tube O.D.		F Pipe Size		D		W Width Across Hex.		N		H		L		I	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/8	3.17	1/8	10.30	.09	2.28	7/16	11.11	.94	23.88	.38	9.65	1.20	30.48	.50	12.70
3/16	4.76	1/8	10.30	.12	3.04	7/16	11.11	.96	24.38	.38	9.65	1.22	30.98	.54	13.72
1/4	6.35	1/8	10.30	.19	4.82	1/2	12.70	1.01	25.65	.38	9.65	1.30	33.02	.60	15.24
1/4	6.35	1/4	13.70	.19	4.82	9/16	14.28	1.19	30.22	.56	14.22	1.48	37.59	.60	15.24
5/16	7.93	1/8	10.30	.20	5.08	9/16	14.28	1.05	26.67	.38	9.65	1.34	34.04	.64	16.25
5/16	7.93	1/4	13.70	.25	6.35	9/16	14.28	1.23	31.24	.56	14.22	1.52	38.61	.64	16.25
3/8	9.52	1/4	13.70	.28	7.11	5/8	15.87	1.28	32.51	.56	14.22	1.57	39.87	.66	16.76
3/8	9.52	3/8	17.10	.28	7.11	11/16	17.46	1.28	32.51	.56	14.22	1.57	39.87	.66	16.76
3/8	9.52	1/2	21.34	.28	7.11	7/8	22.22	1.53	38.86	.75	19.05	1.82	46.22	.66	16.76
1/2	12.70	3/8	17.10	.41	10.41	13/16	20.63	1.31	33.27	.56	14.22	1.71	44.43	.90	22.86
1/2	12.70	1/2	21.34	.41	10.41	7/8	22.22	1.53	38.86	.75	19.05	1.93	49.0	.90	22.86
1/2	12.70	3/4	26.67	.41	10.41	1-1/16	26.98	1.60	40.64	.75	19.05	2.00	50.80	.90	22.86
5/8	15.87	1/2	21.34	.50	12.70	15/16	23.81	1.53	38.86	.75	19.05	1.93	49.02	.96	24.38
3/4	19.05	3/4	26.67	.62	15.74	1-1/16	26.98	1.60	40.64	.75	19.05	2.00	50.80	.96	24.38
1	25.40	1	33.40	.88	22.35	1-3/8	34.92	1.97	50.03	.94	23.87	2.45	62.23	1.23	31.24

"D" - Dimension is minimum opening.
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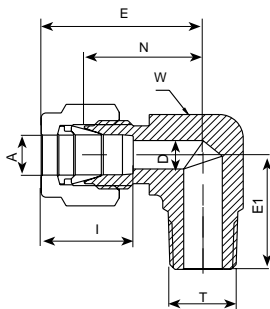
**TUBE SOCKET
WELD UNION**



768 LW Tube socket weld union

A Tube O.D.	C		D MIN. OPENING		W HEX FLAT		F		H		I		L		N		
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	
1/8	3.17	0.34	8.64	0.09	2.28	7/16	11.11	0.31	7.87	0.25	6.35	0.50	12.70	1.14	28.96	0.88	22.35
1/4	6.35	0.41	10.41	0.19	4.80	1/2	12.70	0.44	11.18	0.31	7.87	0.60	15.20	1.32	33.53	1.03	26.16
3/8	9.52	0.47	11.94	0.28	7.10	5/8	15.88	0.62	15.75	0.38	9.65	0.66	16.80	1.48	37.60	1.19	30.23
1/2	12.70	0.47	11.94	0.41	10.40	13/16	20.64	0.75	19.05	0.50	12.7	0.90	22.90	1.62	41.15	1.22	31.00
3/4	19.05	0.47	11.94	0.62	15.80	1-1/16	27.00	1.05	26.67	0.56	14.22	0.96	24.40	1.71	43.43	1.31	33.28
1	25.40	0.56	14.22	0.88	22.35	1-3/8	34.93	1.31	33.27	0.75	19.05	1.23	31.20	2.07	52.58	1.59	40.40

MALE ELBOW

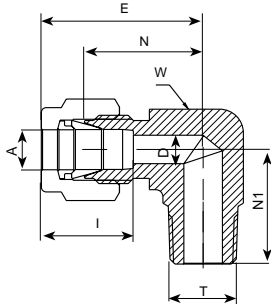


769 L Male Elbow - Tube (Metric) Male NPT Thread

A Tube O.D.	T (NPT)	D	W Width Across Hex.		N	E	E ₁	I
mm	in	mm	mm	in	mm	mm	mm	mm
3	1/8	2.4	11.1	7/16	17.0	23.6	17.8	12.9
3	1/4	2.4	15.9	5/8	18.0	24.6	23.4	12.9
4	1/8	2.4	11.1	7/16	18.8	25.4	18.8	13.7
4	1/4	2.4	15.9	5/8	18.8	25.4	23.4	13.7
6	1/8	4.8	12.7	1/2	19.6	27.0	18.8	15.3
6	1/4	4.8	12.7	1/2	19.6	27.0	23.4	15.3
6	3/8	4.8	18.5	13/16	20.6	29.8	26.2	15.3
6	1/2	4.8	23.8	15/16	24.4	31.8	33.0	15.3
8	1/8	4.8	15.9	5/8	21.3	28.8	19.8	16.2
8	1/4	6.4	16.0	5/8	21.3	28.8	24.4	16.2
8	1/2	6.4	23.8	15/16	25.1	32.6	33.0	16.2
10	1/8	4.8	17.5	11/16	23.9	31.5	21.6	17.2
10	1/4	7.1	17.5	11/16	23.9	31.5	26.2	17.2
10	3/8	7.9	17.5	13/16	20.6	31.5	26.2	17.2
10	1/2	7.9	23.8	15/16	25.9	33.5	33.0	17.2
12	1/4	7.1	20.5	13/16	25.9	36.0	28.2	22.8
12	3/8	9.5	20.5	13/16	25.9	36.0	28.2	22.8
12	1/2	9.5	24.0	15/16	25.9	36.0	33.0	22.8
12	3/4	9.5	28.6	1-1/8	29.7	39.8	36.8	22.8
15	1/2	11.9	24.0	15/16	27.9	38.0	35.1	24.4
16	3/8	9.5	24.0	15/16	27.9	38.0	30.2	24.4
16	1/2	11.9	23.8	15/16	27.9	38.0	35.1	24.4
16	3/4	12.7	28.6	1-1/8	29.7	39.8	36.8	24.4
18	1/2	11.9	28.6	1-1/8	29.7	39.8	36.8	24.4
18	3/4	15.1	28.6	1-1/8	29.7	39.8	36.8	24.4
20	1/2	11.9	30.2	1-3/16	34.5	44.6	41.7	26.0
20	3/4	15.9	30.2	1-3/16	34.5	44.6	41.7	26.0
22	3/4	15.9	30.2	1-3/16	34.5	44.6	41.7	26.0
22	1	18.3	35.0	1-3/8	34.5	44.6	46.5	26.0
25	3/4	15.9	35.0	1-3/8	36.8	49.1	41.7	31.3
25	1	21.8	35.0	1-3/8	36.8	49.1	46.5	31.3

"D" - Dimension is minimum opening.
Dimensions are for reference only, and are subject to change without notice.

MALE ELBOW

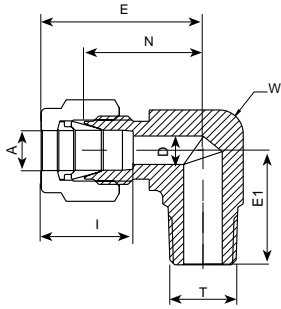


769 L Male Elbow - Tube (Metric) Male NPT Thread

A Tube O.D.		T (NPT)		D		W Width Across Hex.		N		E		N ₁		I	
in	mm	in	in	mm	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/16	1.58	1/16	.05	1.27	3/8	9.52	.06	15.24	.75	19.05	.70	17.78	.34	8.6	
1/16	1.58	1/8	.05	1.27	7/16	11.11	.06	15.24	.75	19.05	.70	17.78	.34	8.6	
1/8	3.17	1/16	.09	2.28	3/8	9.52	.67	17.02	.93	23.62	.70	17.78	.50	12.7	
1/8	3.17	1/8	.09	2.28	7/16	11.11	.67	17.02	.93	23.62	.70	17.28	.50	12.7	
1/8	3.17	1/4	.09	2.28	5/8	15.9	.71	18.03	.97	24.64	.92	23.37	.50	12.7	
3/16	4.76	1/4	.12	3.04	5/8	15.9	.74	18.80	1.00	25.40	.92	23.37	.54	13.7	
3/16	4.76	1/8	.12	3.04	1/2	12.7	.74	18.8	1.00	25.4	.74	18.8	.54	13.7	
1/4	6.35	1/8	.19	4.82	1/2	12.70	.77	19.56	1.06	26.92	.74	18.8	.60	15.2	
1/4	6.35	1/4	.19	4.82	1/2	12.70	.77	19.56	1.06	26.92	.92	23.37	.60	15.2	
1/4	6.35	3/8	.19	4.82	13/16	20.6	.88	22.35	1.17	29.71	1.03	26.16	.60	15.2	
1/4	6.35	1/2	.19	4.82	15/16	23.8	.96	24.38	1.25	31.75	1.30	33.02	.60	15.2	
5/16	7.93	1/8	.19	4.82	5/8	15.87	.84	21.34	1.13	28.7	.78	45.21	.64	16.2	
5/16	7.93	1/4	.25	6.35	5/8	15.87	.84	21.34	1.13	28.7	.96	49.78	.64	16.2	
5/16	7.93	3/8	.25	6.35	13/16	20.6	.91	23.11	1.20	30.48	1.03	26.16	.64	16.2	
3/8	9.52	1/8	.19	4.82	5/8	15.87	.91	23.11	1.20	30.48	.82	20.83	.66	14.8	
3/8	9.52	1/4	.28	7.11	5/8	15.87	.91	23.11	1.20	30.48	1.00	25.40	.66	14.8	
3/8	9.52	3/8	.28	7.11	13/16	20.6	.94	23.87	1.23	31.24	1.03	26.16	.66	14.8	
3/8	9.52	1/2	.28	7.11	15/16	23.8	1.02	25.9	1.31	33.28	1.30	33.02	.66	14.8	
3/8	9.52	3/4	.28	7.11	1 1/8	28.6	1.17	29.71	1.46	37.08	1.45	36.83	.66	14.8	
1/2	12.70	1/4	.28	7.11	13/16	20.63	1.02	25.9	1.42	36.07	1.11	28.19	.90	22.9	
1/2	12.70	3/8	.38	9.65	13/16	20.63	1.02	25.9	1.42	36.07	1.11	28.19	.90	22.9	
1/2	12.70	1/2	.41	10.41	15/16	23.8	1.02	25.9	1.42	36.07	1.30	33.02	.90	22.9	
1/2	12.70	3/4	.41	10.41	1 1/8	28.6	1.17	29.71	1.57	39.88	1.45	36.83	.90	22.9	
5/8	15.87	3/8	.38	9.61	15/16	23.81	1.10	27.94	1.50	38.1	1.19	30.23	.96	24.4	
5/8	15.87	1/2	.47	11.94	15/16	23.81	1.10	27.94	1.50	38.1	1.38	35.05	.96	24.4	
5/8	15.87	3/4	.50	12.70	1 1/8	28.6	1.17	29.71	1.57	39.88	1.45	36.83	.96	24.4	
3/4	19.05	1/2	.47	11.94	1 1/8	28.6	1.17	29.71	1.57	39.88	1.45	36.83	.96	24.4	
3/4	19.05	3/4	.62	15.74	1 1/8	28.6	1.17	29.71	1.57	39.88	1.45	36.83	.96	24.4	
7/8	22.22	3/4	.62	15.74	1 3/16	30.2	1.36	34.54	1.76	44.7	1.64	41.66	1.02	25.9	
1	25.40	3/4	.62	15.74	1 3/8	34.9	1.45	36.83	1.93	49.02	1.64	41.66	1.23	31.2	
1	25.40	1	.88	22.35	1 3/8	34.9	1.45	36.83	1.93	49.02	1.83	46.48	1.23	31.2	
1 1/4	31.75	1 1/4	1.09	27.7	1 11/16	42.9	1.75	44.5	2.62	66.5	1.88	47.8	1.62	41.1	
1 1/2	38.1	1 1/2	1.34	34.0	2	50.8	2.00	50.8	3.07	78.0	2.38	60.5	1.97	50.0	

"D" - Dimension is minimum opening.
Dimensions are for reference only, and are subject to change without notice.

MALE ELBOW



Reference Specifications:
Normen:

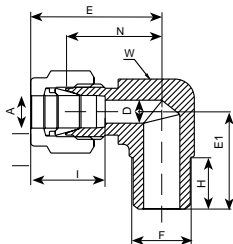
- DIN - 2999
- BS - 21
- JIS - BO203
- ISO - 7/1-BSP-T

769 LR Male Elbow - Tube (Metric) ISO Tapered Thread

A Tube O.D.	T (ISO)	D		W Width Across Hex.		N		E		E ₁	I
mm	in	mm	mm	mm	in	mm	mm	mm	mm	mm	mm
3	R-1/8	2.4	11.1	7/16	17.0	23.6	17.8	12.9			
3	R-1/4	2.4	15.9	5/8	18.0	24.6	23.4	12.9			
4	R-1/8	2.4	11.1	7/16	18.8	25.4	18.8	13.7			
4	R-1/4	2.4	15.9	5/8	18.8	25.4	23.4	13.7			
6	R-1/8	4.8	12.7	1/2	19.6	27.0	18.8	15.3			
6	R-1/4	4.8	12.7	1/2	19.6	27.0	23.4	15.3			
6	R-3/8	4.8	20.6	13/16	22.4	29.8	26.2	15.3			
6	R-1/2	4.8	23.5	15/16	24.4	31.8	33.0	15.3			
8	R-1/8	4.8	15.9	5/8	21.3	28.8	19.8	16.2			
8	R-1/4	6.4	15.9	5/8	21.3	28.8	24.4	16.2			
8	R-3/8	6.4	20.6	13/16	23.1	31.3	26.2	16.2			
8	R-1/2	6.4	23.8	15/16	25.1	32.6	33.0	16.2			
10	R-1/4	7.1	17.4	11/16	23.9	31.5	26.2	17.2			
10	R-3/8	7.9	20.6	13/16	23.9	31.5	26.2	17.2			
10	R-1/2	7.9	23.5	15/16	25.9	33.5	33.0	17.2			
12	R-1/8	4.8	20.5	13/16	25.9	36.0	23.6	22.8			
12	R-1/4	7.1	20.5	13/16	25.9	36.0	28.2	22.8			
12	R-3/8	9.5	20.5	13/16	25.9	36.0	28.2	22.8			
12	R-1/2	9.5	24.0	15/16	25.9	36.0	33.0	22.8			
12	R-3/4	9.5	28.6	1 1/8	29.7	39.8	36.8	22.8			
16	R-3/8	9.5	24.0	15/16	27.9	38.0	30.2	24.4			
16	R-1/2	11.9	24.0	15/16	27.9	38.0	35.1	24.4			
18	R-1/2	11.9	28.6	1 1/8	29.7	39.8	36.8	24.4			
18	R-3/4	15.1	28.6	1 1/8	29.7	39.8	36.8	24.4			
20	R-1/2	11.9	30.2	1 3/16	34.5	44.6	41.7	26.0			
20	R-3/4	15.9	30.2	1 3/16	34.5	44.6	41.7	26.0			
22	R-3/4	15.9	30.2	1 3/16	34.5	44.6	41.7	26.0			
22	R-1	18.3	35.0	1 3/8	34.5	44.6	46.5	26.0			
25	R-3/4	15.9	35.0	1 3/8	36.8	49.1	41.7	31.3			
25	R-1	21.8	35.0	1 3/8	36.8	49.1	46.5	31.3			

769 LN Male Pipe Weld Elbow

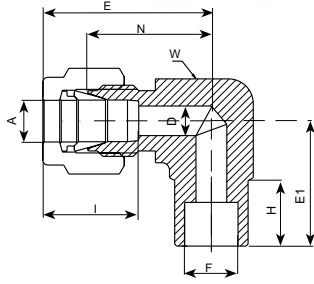
MALE PIPE WELD ELBOW



A Tube O.D.	F Pipe Size	D		W Width Across Hex.		N		H		E		E ₁	I				
in mm	Nom mm	in mm	mm	in mm	mm	in mm	mm	in mm	mm	in mm	mm	in mm	mm	in mm			
1/4	6.35	1/8	10.80	.19	4.82	1/2	12.70	.77	19.56	.38	7.65	1.06	26.92	.74	18.8	7.60	15.24
1/4	6.35	1/4	13.70	.19	4.82	1/2	12.70	.77	19.56	.56	14.22	1.06	26.92	.92	23.37	7.60	15.24
3/8	9.52	1/4	13.70	.28	7.11	5/8	15.87	.91	23.11	.56	14.22	1.20	30.48	1.00	25.40	7.66	16.76
1/2	12.70	1/2	21.34	.41	10.41	13/16	20.64	1.02	25.91	.75	19.05	1.42	36.06	1.30	33.02	8.90	22.86
3/4	19.05	3/4	26.67	.62	15.75	1-1/8	28.6	1.17	29.72	.75	19.05	1.57	39.88	1.45	36.83	8.90	24.38

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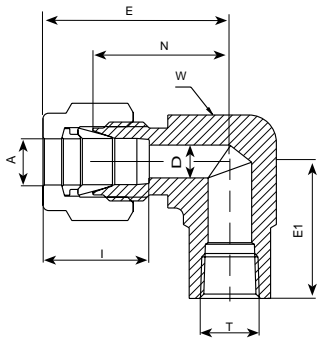
SOCKET WELD ELBOW



769 LW Socket Weld Elbow

A Tube O.D.		D		W Width Across Hex.		F		N		H		E		E ₁		I	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/4	6.35	.19	4.82	1/2	12.70	1/4	6.35	.78	19.81	.31	7.87	1.07	27.17	.78	19.81	0.6	15.2
3/8	9.52	.28	7.11	5/8	15.87	3/8	9.50	.91	23.11	.38	9.65	1.20	30.98	.91	23.11	0.66	16.76
1/2	12.70	.41	10.41	13/16	20.64	1/2	12.70	1.02	25.91	.50	12.70	1.41	35.81	1.02	25.91	0.90	22.9

FEMALE ELBOW



770 L Female Elbow - Tube (Metric) to Female NPT Thread

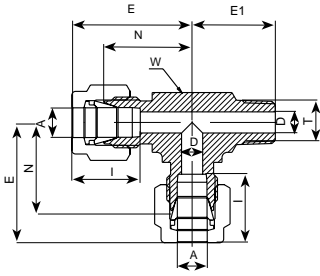
A Tube O.D. mm	T (NPT) in	D	W Width Across Hex.		N	E	E ₁	I
mm	in	mm	mm	in	mm	mm	mm	mm
6	1/8	4.8	16.0	5/8	19.6	27.0	19.1	17.7
6	1/4	4.8	20.6	13/16	22.4	29.8	22.4	17.7
12	1/2	9.5	30.0	1 1/8	28.6	38.8	28.5	22.8
10	1/4	7.9	20.6	13/16	25.9	33.5	22.4	22.8
12	1/4	9.5	20.6	13/16	25.9	36.0	22.4	22.8

770 L Female Elbow - Tube (Inch) to Female NPT Thread

A Tube O.D.	T (NPT)	D	W Width Across Hex.		N	E	E ₁	I
in	in	in	in	in	in	in	in	in
1/8	3/16	.09	5/8	1/2	.71	18.03	.97	24.64
1/8	1/4	.09	13/16	1/2	.82	20.83	1.08	27.43
3/16	1/8	.12	5/8	1/2	.74	18.8	1.02	25.9
1/4	1/8	.19	5/8	1/2	.77	19.56	1.06	26.92
1/4	1/4	.19	13/16	1/2	.88	22.35	1.17	29.72
1/4	1/2	.19	15/16	1/2	.96	24.38	1.25	31.75
1/4	1/2	.19	1-1/8	1/2	1.07	27.18	1.36	34.54
5/16	1/8	.25	5/8	1/2	.84	21.34	1.13	28.7
5/16	1/4	.25	13/16	1/2	.91	23.11	1.20	30.48
3/8	1/8	.28	5/8	1/2	.75	19.05	1.20	30.48
3/8	1/4	.28	13/16	1/2	.88	22.35	1.23	31.24
3/8	3/8	.28	15/16	1/2	.88	22.35	1.31	33.27
3/8	1/2	.28	1-1/8	1/2	1.12	28.45	1.42	36.07
1/2	1/4	.41	13/16	1/2	.88	22.35	1.42	36.07
1/2	3/8	.41	15/16	1/2	.88	22.35	1.42	36.07
1/2	1/2	.41	1-1/8	1/2	1.12	28.44	1.53	36.86
5/8	3/8	.50	15/16	1/2	.88	22.35	1.50	38.1
5/8	1/2	.50	1-1/8	1/2	1.12	28.44	1.57	39.88
3/4	1/2	.62	1-1/8	1/2	1.12	28.44	1.57	39.88
3/4	3/4	.62	1-3/8	1/2	1.25	31.75	1.76	44.7
7/8	3/4	.72	1-3/8	1/2	1.25	31.75	1.76	44.7
1	3/4	.88	1-3/8	1/2	1.25	31.75	1.93	49.02
1	1	.88	1-11/16	1/2	1.50	38.10	2.11	53.59

"D" - Dimension is minimum opening.
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MALE RUN TEE



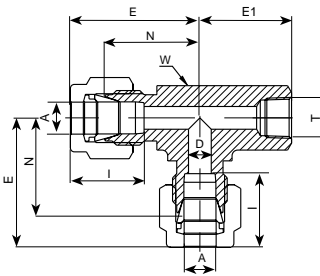
771 L Male Run Tee - Tube (Metric) to Male NPT Thread

A Tube O.D.	T (NPT)	D	W Width Across Hex.		N	E	E ₁	I
			mm	in				
6	1/8	4.8	12.7	1/2	19.6	27.0	18.0	15.3
6	1/4	4.8	16.0	5/8	19.6	27.0	23.4	15.3
8	1/8	4.8	16.0	5/8	22.4	29.9	20.8	15.3
8	1/4	6.4	16.0	5/8	22.4	29.9	25.4	16.2
10	1/4	7.1	17.5	11/16	25.9	33.5	28.2	16.2
12	1/4	7.1	20.6	13/16	25.9	36.0	28.2	22.8
12	3/8	9.5	20.6	13/16	25.9	36.0	28.2	22.8
12	1/2	9.5	24.0	15/16	25.9	36.0	33.0	22.8
16	1/2	11.9	24.0	15/16	27.9	38.0	35.0	24.4

771 L Male Run Tee - Tube (Inch) to Male NPT Thread

A Tube O.D.		T (NPT)	D	W Width Across Hex.		N	E	E ₁	I					
in	mm			in	mm					in	mm			
1/8	3.17	1/8	.09	2.28	7/16	11.11	.67	17.02	.93	23.62	.70	17.78	.50	12.7
1/8	3.17	1/4	.09	2.28	5/8	15.9	.71	18.03	.97	24.64	.92	23.37	.50	12.7
3/16	4.76	1/8	.12	3.05	7/16	11.11	.70	17.78	.96	24.38	.70	17.78	.54	13.7
1/4	6.35	1/8	.19	4.82	1/2	12.70	.77	19.56	1.06	26.92	.74	18.8	.60	15.2
1/4	6.35	1/4	.19	4.82	5/8	15.9	.77	19.56	1.06	26.92	.92	23.37	.60	15.2
5/16	7.93	1/8	.19	4.82	5/8	15.87	.88	22.35	1.17	29.71	.82	20.83	.64	16.25
3/8	9.52	1/4	.28	7.11	5/8	15.87	.91	23.11	1.20	30.48	1.00	25.40	.66	16.76
3/8	9.52	3/8	.28	7.11	13/16	20.63	1.02	25.91	1.31	33.27	1.11	28.19	.66	16.76
1/2	12.70	3/8	.41	10.41	13/16	20.63	1.02	25.9	1.42	36.07	1.11	28.19	.90	22.86
1/2	12.70	1/2	.41	10.41	15/16	23.8	1.02	25.9	1.42	36.07	1.30	33.02	.90	22.86
5/8	15.87	1/2	.47	11.94	15/16	23.81	1.10	27.94	1.50	38.1	1.38	35.05	.96	24.38
3/4	19.05	3/4	.62	15.75	1-1/8	28.6	1.17	29.72	1.57	39.88	1.45	36.83	.96	24.38

FEMALE RUN TEE



771 LF Female Run Tee - Tube (Inch) to Female NPT Thread

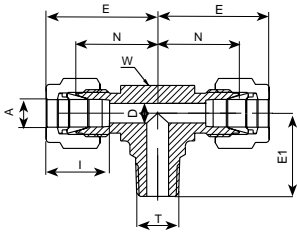
A Tube O.D.	T (NPT)	D	W Width Across Hex.		N	E	E ₁	I						
			in	mm										
1/8	3.17	1/8	.09	2.28	5/8	15.87	.71	18.03	.97	24.44	.75	19.05	0.5	12.7
1/4	6.35	1/8	.19	4.82	5/8	15.87	.77	19.56	1.06	26.92	.75	19.05	0.6	15.2
1/4	6.35	1/4	.19	4.82	13/16	20.63	.88	22.35	1.17	29.71	.88	22.35	0.6	15.2
3/8	9.52	1/4	.28	7.11	13/16	20.63	.94	23.87	1.23	31.24	.88	22.35	0.66	16.8
1/2	12.70	3/8	.41	10.41	15/16	23.81	1.02	25.9	1.42	36.07	.88	22.35	0.9	22.9
1/2	12.70	1/2	.41	10.41	1-1/8	28.6	1.17	29.72	1.57	39.88	1.12	28.45	0.9	22.9
3/4	19.05	3/4	.62	15.75	1-3/8	34.92	1.36	34.54	1.76	44.70	1.25	31.75	0.9	24.4

771 LF Female Run Tee - Tube (Metric) to Female NPT Thread

A Tube O.D.	T (NPT)	D	W Width Across Hex.		N	E	E ₁	I					
			mm	in									
6	1/8	.19	4.8	5/8	15.87	.77	19.6	1.06	27.0	.74	19.00	.60	15.3
6	1/4	.19	4.8	13/16	20.63	.88	22.4	1.17	29.8	.87	22.30	.60	15.3
12	1/4	.37	9.5	13/16	20.6	1.01	25.9	1.41	36.0	.88	22.40	.89	22.8
12	1/2	.37	9.5	1-1/8	28.6	1.16	29.7	1.11	28.4	1.12	28.50	.89	22.8

"D" - Dimension is minimum opening.
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MALE BRANCH TEE



772 L Male Branch Tee - Tube (Metric) to Male NPT Thread

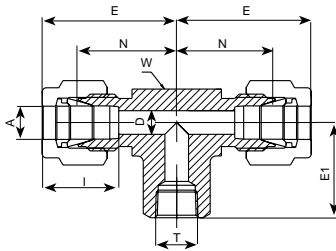
A Tube O.D.	T (NPT)	D	W Width Across Hex.		N	E	E ₁	I
			mm	in				
6	1/8	4.8	12.7	1/2	19.6	27.0	18.8	15.3
6	1/4	4.8	16.0	5/8	19.6	27.0	23.4	15.3
8	1/8	4.8	15.9	5/8	22.4	29.9	20.8	16.2
8	1/4	6.4	15.9	5/8	22.4	29.9	25.4	16.2
10	1/4	7.1	17.5	11/16	25.9	33.5	28.2	17.2
12	1/4	7.1	20.5	13/16	25.9	36.0	28.2	17.2
12	3/8	9.5	20.5	13/16	25.9	36.0	28.2	22.8
12	1/2	9.5	24.0	15/16	25.9	36.0	33.0	22.8
16	1/2	11.9	24.0	15/16	28.7	38.8	35.8	24.4

772 L Male Branch Tee - Tube (Inch) to Male NPT Thread

A Tube O.D.		T (NPT)	D	W Width Across Hex.		N	E	E ₁	I					
in	mm			in	mm					in	mm			
1/8	3.17	1/8	.09	2.28	7/16	11.11	.67	17.02	.93	23.62	.70	17.78	0.5	12.7
1/8	3.17	1/4	.09	2.28	5/8	15.87	.71	18.03	.97	24.64	.92	23.37	0.5	12.7
3/16	4.76	1/8	.12	3.04	7/16	11.1	.70	17.78	.96	24.38	.70	17.78	.54	13.7
1/4	6.35	1/8	.19	4.82	1/2	12.70	.77	19.56	1.06	26.9	.74	18.8	.60	15.2
1/4	6.35	1/4	.19	4.82	5/8	15.87	.77	19.56	1.06	26.9	.92	23.87	.60	15.2
5/16	7.93	1/8	.19	4.82	5/8	15.87	.88	22.35	1.17	29.71	.82	20.83	.64	16.2
3/8	9.52	1/4	.28	7.11	5/8	15.87	.91	23.11	1.20	30.48	1.00	25.40	.66	16.76
3/8	9.52	3/8	.28	7.11	13/16	20.63	1.02	25.91	1.31	33.27	1.11	28.19	.66	16.76
1/2	12.70	3/8	.38	9.65	13/16	20.63	1.02	25.91	1.42	36.07	1.11	28.19	.90	22.9
1/2	12.70	1/2	.41	10.41	15/16	23.8	1.02	25.96	1.42	36.07	1.30	33.02	.90	22.9
5/8	15.87	1/2	0.47	11.94	15/16	23.81	1.13	28.7	1.53	38.86	1.41	35.8	.96	24.4
3/4	19.05	3/4	.62	15.75	1-1/8	28.6	1.17	29.72	1.57	39.88	1.45	36.83	.96	24.4

"D" - Dimension is minimum opening.
Dimensions are for reference only, and are subject to change without notice.

FEMALE BRANCH TEE



772 LF Female Branch Tee - Tube (Metric) to Female NPT Thread

A Tube O.D.	T (NPT)	D	W Width Across Hex.		N	E	E ₁	I
			mm	in				
6	1/8	4.8	15.9	5/8	19.6	27.0	19.0	15.3
6	1/4	4.8	20.6	13/16	22.4	29.8	22.4	15.3
10	1/4	7.9	20.6	13/16	25.9	33.5	22.4	17.2
10	3/8	7.9	23.8	15/16	25.9	33.5	22.4	15.3
12	1/4	9.5	20.6	13/16	25.9	36.0	22.4	22.8
12	1/2	9.5	28.6	1-1/8	28.7	38.8	28.5	22.8
16	1/2	12.7	28.6	1-1/8	28.7	38.8	28.4	24.4

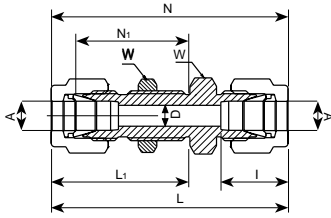
772 LF Female Branch Tee - Tube (Inch) to Female NPT Thread

A Tube O.D.	T (NPT)	D	W Width Across Hex.		N	E	E ₁	I						
			in	mm										
1/8	3.17	1/8	.09	2.28	5/8	15.87	.71	18.3	.97	24.64	.75	19.05	0.5	31.2
1/4	6.35	1/8	.19	4.82	5/8	15.9	.77	19.56	1.06	26.96	.75	19.05	0.6	12.7
1/4	6.35	1/4	.19	4.82	13/16	20.63	.88	22.35	1.17	29.71	.88	22.35	0.6	15.2
3/8	9.52	1/4	.28	7.11	13/16	20.63	.94	23.87	1.23	31.24	.88	22.35	.66	15.2
1/2	12.70	3/8	.41	10.41	15/16	23.81	1.02	25.9	1.42	36.07	.88	22.35	.90	16.8
1/2	12.70	1/4	.41	10.41	13/16	20.63	1.02	25.91	1.42	36.06	.88	22.35	0.90	22.9
1/2	12.70	1/2	.41	10.41	1-1/8	28.6	1.13	28.70	1.53	38.86	1.12	28.45	0.90	22.9
5/8	15.87	1/2	.50	12.70	1-1/8	28.6	1.13	28.7	1.53	38.86	1.12	28.44	0.96	22.9
3/4	19.05	3/4	.62	15.74	1-3/8	34.9	1.36	34.54	1.76	44.7	1.25	31.75	0.96	24.4
1	25.4	3/4	.88	22.35	1-3/8	34.92	1.45	36.83	1.93	49.02	1.25	31.75	1.23	24.4
1	25.4	1	.88	22.35	1-11/16	42.86	1.63	41.4	2.11	53.6	1.50	38.10	1.23	31.2

"D" - Dimension is minimum opening.

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BULKHEAD UNION



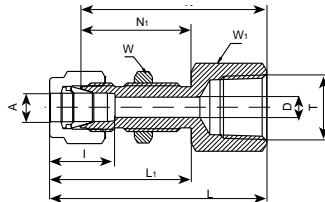
774 L Bulkhead Union - Tube (Inch) to Tube (Inch)

A Tube O.D.	D		W Width Across Hex.		N	N ₁	L		L ₁		I	Panel Hole Drill Size		Max Panel Thickness					
	in	mm	in	mm			in	mm	in	mm		in	mm	in	mm	in	mm		
1/16	1.58	.05	1.27	5/16	7.93	0.94	23.88	0.53	13.46	1.24	31.5	0.68	17.3	.34	8.6	13/64	5.16	.12	3.05
1/8	3.17	.09	2.28	1/2	12.70	1.50	38.10	0.97	24.63	2.02	51.30	1.23	31.24	.50	12.7	21/64	8.33	.50	12.70
3/16	4.76	.12	3.04	9/16	14.28	1.59	40.38	1.00	25.40	2.11	53.59	1.26	32.00	.54	13.7	25/64	9.92	.50	12.70
1/4	6.35	.19	4.82	5/8	15.87	1.69	42.92	1.03	26.16	2.27	57.65	1.32	33.52	.60	15.2	29/64	11.50	.40	10.16
5/16	7.93	.25	6.35	11/16	17.46	1.81	45.97	1.12	28.44	2.39	60.70	1.41	35.81	.64	16.2	33/64	13.09	.43	10.92
3/8	9.52	.28	7.11	3/4	19.05	1.87	47.5	1.16	29.46	2.45	62.2	1.45	36.83	.66	16.8	37/64	14.68	.44	11.17
1/2	12.70	.41	10.41	15/16	23.81	2.00	50.20	1.25	31.75	2.80	71.12	1.65	41.91	.90	22.9	49/64	19.44	.50	12.70
5/8	15.87	.50	12.7	1-1/16	26.98	2.06	52.32	1.28	32.51	2.86	72.64	1.68	42.67	.96	24.4	57/64	22.62	.50	12.70
3/4	19.05	.50	12.70	1-3/16	30.16	2.31	58.67	1.47	37.33	3.11	78.99	1.87	47.49	.96	24.4	1-1/64	25.79	.66	16.76
1	25.40	.88	22.35	1-5/8	41.27	2.81	71.37	1.78	45.21	3.77	95.76	2.26	57.40	1.23	31.2	1-21/64	33.73	.75	19.05

774 L Bulkhead Union - Tube (Metric) to Tube (Metric)

A Tube O.D.	D	W Width Across Hex.		N	N ₁	L	L ₁	I	Panel Hole Drill Size	Max Panel Thickness
		mm	mm							
3	2.4	14.0	38.1	24.6	51.3	31.2	12.9	8.30	12.7	
4	2.4	14.0	40.4	25.4	53.6	32.0	13.7	9.90	12.7	
6	4.8	16.0	42.9	26.2	57.7	33.6	15.3	11.50	10.2	
8	6.4	18.0	46.0	28.6	61.0	36.1	16.2	13.10	11.2	
10	7.9	22.0	48.5	29.4	63.7	37.0	17.2	16.25	11.2	
12	9.5	24.0	50.8	31.8	71.0	41.9	22.8	19.50	12.7	
15	11.9	27.0	52.3	32.5	72.5	42.6	24.4	22.80	12.7	
16	12.7	27.0	52.3	32.5	72.5	42.6	24.4	22.80	12.7	
18	15.1	30.0	58.7	37.3	78.9	47.4	24.4	26.00	16.8	
20	15.9	35.0	64.3	42.9	84.5	53.0	26.0	29.00	23.9	
25	21.8	40.0	71.4	45.2	96.0	57.5	31.2	33.70	19.0	

BULKHEAD FEMALE CONNECTOR

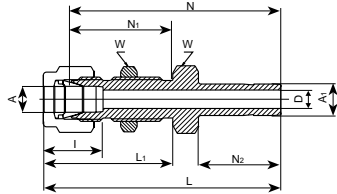


774 LF Bulkhead Female Connector - Tube (Inch) to Female NPT Thread

A Tube O.D.	t (NPT)	D		W Width Across Hex.		W ₁ Width Across Hex.		N	N ₁	L		L ₁		I	Panel Hole Drill Size		Max Panel Thickness					
		in	mm	in	mm	in	mm			in	mm	in	mm		in	mm	in	mm	in	mm		
1/8	3.17	1/8	.09	2.28	9/16	14.28	1/2	12.70	1.50	38.10	.97	24.63	1.76	44.70	1.23	31.24	0.5	12.7	21/64	8.33	.50	12.70
1/4	6.35	1/8	.19	4.82	5/8	15.87	5/8	15.87	1.56	39.62	1.03	26.16	1.85	46.99	1.32	33.52	.60	15.2	29/64	11.50	.40	10.16
1/4	6.35	1/4	.19	4.82	3/4	19.05	5/8	15.87	1.75	44.45	1.03	26.16	2.04	51.81	1.32	33.52	.60	15.2	29/64	11.50	.40	10.16
3/8	9.52	1/4	.28	7.11	3/4	19.05	3/4	19.05	1.88	47.75	1.16	29.46	2.17	55.11	1.45	36.83	.66	16.8	37/64	14.68	.44	11.17
1/2	12.70	3/8	.41	10.41	15/16	23.81	15/16	23.81	2.03	51.56	1.25	31.75	2.43	61.72	1.65	41.91	.90	22.9	49/64	19.44	.50	12.70
1/2	12.70	1/2	.41	10.41	1-1/16	26.98	15/16	23.81	2.22	56.38	1.25	31.75	2.62	66.54	1.65	41.91	.90	22.9	49/64	19.44	.50	12.70

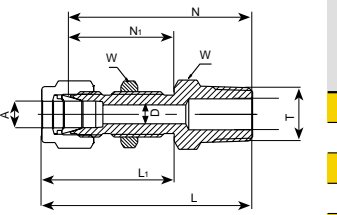
"D" - Dimension is minimum opening.
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BULKHEAD REDUCER



774 LT Bulkhead Reducer - Tube (Inch) to Tube (Inch)																		
A		A ₁	D			W		N		N ₁		N ₂		L		L ₁		I
Tube O.D.			Width			Across Hex.												
in	mm	in	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/8	3.17	1/8	.08	2.03	1/2	12.70	1.69	42.92	.97	24.63	.53	13.46	1.95	49.53	1.23	31.24	0.5	12.7
1/4	6.35	1/4	.19	4.82	5/8	15.87	1.90	48.26	1.03	26.16	.62	15.74	2.19	55.62	1.32	33.52	0.6	15.2
3/8	9.52	3/8	.28	7.11	3/4	19.05	2.13	54.10	1.16	29.46	.69	17.52	2.42	61.46	1.45	36.83	0.66	16.8
1/2	12.70	1/2	.39	9.90	15/16	23.81	2.47	62.73	1.25	31.75	.91	23.11	2.87	72.89	1.65	41.91	0.9	22.9

BULKHEAD MALE CONNECTOR

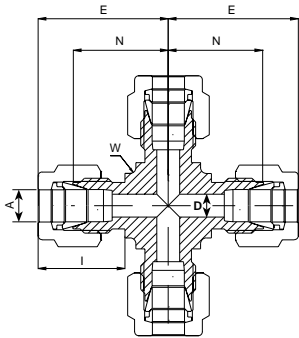


774 LM Bulkhead Male Connector - Tube (Metric) to Male NPT Thread										
A	T	D	W		N	N ₁	L	L ₁	Pane Hole Drill Size	Max Pane Thickness
Tube O.D.	(NPT)		Width Across Hex.							
mm	inch	mm	mm	mm	mm	mm	mm	mm	mm	mm
6	1/8	4.8	16.0	42.2	26.2	49.6	33.6	11.5	10.2	
6	1/4	4.8	16.0	46.0	26.2	53.4	33.6	11.5	10.2	
12	1/2	9.5	24.0	57.8	31.8	68.1	41.9	19.5	12.7	

774 LM Bulkhead Male Connector - Tube (Inch) to Male NPT Thread																		
A	T	D	W		N	N ₁	L	L ₁	Panel Hole Drill Size	Max Panel Thickness								
Tube O.D.	(NPT)		Width Across Hex.															
in	mm	in	in	mm	in	mm	in	mm	in	mm								
1/8	3.17	1/8	.09	2.28	1/2	12.70	1.57	39.87	.97	24.63	1.83	46.48	1.23	31.24	21/64	8.33	12.70	.50
1/4	6.35	1/8	.19	4.82	5/8	15.87	1.66	42.16	1.03	26.16	1.95	49.53	1.32	33.52	29/64	11.50	10.16	.40
1/4	6.35	1/4	.19	4.82	5/8	15.87	1.81	45.97	1.03	26.16	2.10	53.34	1.32	33.52	29/64	11.50	10.16	.40
3/8	9.52	1/4	.28	7.11	3/4	19.05	1.97	50.03	1.16	29.46	2.26	57.40	1.45	36.83	37/64	14.68	11.17	.44
1/2	12.70	3/8	.37	9.40	15/16	23.81	2.09	53.09	1.25	31.75	2.49	63.25	1.65	41.91	49/64	19.44	12.70	.50
1/2	12.70	1/2	.41	10.41	15/16	23.81	2.31	58.8	1.25	31.75	2.71	68.83	1.65	41.91	49/64	19.44	12.70	.50

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UNION CROSS



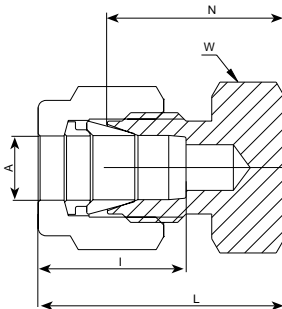
7102 L Union Cross - All Tubes (Metric)

A Tube O.D. mm	D mm	W Width Across Hex. mm	N mm	E mm	I mm
3	2.4	9.5	15.7	22.3	12.9
6	4.8	12.7	19.6	27.0	15.3
8	6.4	15.9	22.4	29.9	16.2
10	7.9	20.6	25.9	33.5	17.2
12	9.5	20.6	25.9	36.0	22.8
16	12.7	23.8	26.9	37.0	24.4
18	15.1	27.0	28.2	38.3	24.4
20	15.9	34.9	34.5	44.6	26.0

7102 L Union Cross - All Tubes (Inch)

A Tube O.D. in	mm	D in	mm	W Width Across Hex. in	mm	N in	mm	E in	mm	I in	mm
1/8	3.17	.09	2.28	3/8	9.52	.62	15.74	.88	22.35	.50	12.7
1/4	6.35	.19	4.82	1/2	12.70	.77	19.56	1.07	27.18	.60	15.2
5/16	7.93	.25	6.35	5/8	15.87	.88	22.35	1.17	29.71	.64	16.2
3/8	9.52	.28	7.11	5/8	15.87	.91	23.11	1.20	30.48	.66	16.8
1/2	12.70	.41	10.41	13/16	20.63	1.02	25.9	1.42	36.07	.90	22.9
3/4	19.05	.62	15.74	1-1/16	26.98	1.17	29.72	1.57	39.88	.96	24.4
1	25.40	.88	22.35	1-3/8	34.9	1.45	36.8	1.93	49.02	1.23	31.2

CAP



7108 L Cap - Capping End of Tube (Metric)

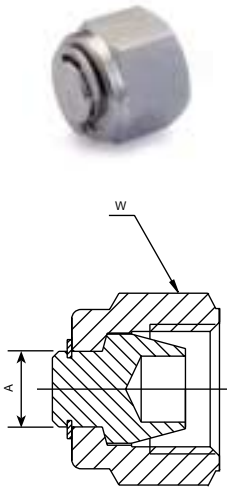
A Tube O.D. mm	W Width Across Hex. mm	N mm	L mm	I mm
2	12	13.5	20.1	12.9
3	12	13.5	20.1	12.9
4	12	14.7	21.3	13.7
6	14	15.7	23.1	15.3
8	15	17.0	24.6	16.2
10	18	15.0	26.6	17.2
12	22	19.0	29.1	22.8
15	24	19.8	29.9	24.4
16	24	19.8	29.9	24.4
18	27	21.3	31.4	24.4
20	30	23.9	34.0	26.0
22	30	23.9	34.0	26.0
25	35	26.2	38.5	31.3

7108 L Cap - Capping End of Tube (Inch)

A Tube O.D. in	mm	W Width Across Hex. in	mm	N in	mm	L in	mm	I in	mm
1/16	1.58	5/16	7.93	.44	11.17	.59	14.98	.34	8.6
1/8	3.17	7/16	11.11	.53	13.46	.79	20.06	.50	12.7
3/16	4.76	7/16	11.11	.58	14.73	.84	21.84	.54	13.7
1/4	6.35	1/2	12.70	.62	15.74	.91	23.11	.60	15.2
5/16	7.93	9/16	14.28	.67	17.01	.96	24.38	.64	16.2
3/8	9.52	5/8	15.87	.72	18.28	1.01	26.65	.66	16.2
1/2	12.70	13/16	20.63	.75	19.05	1.15	29.21	.90	16.8
5/8	15.87	15/16	23.81	.78	19.81	1.18	29.97	.96	22.9
3/4	19.05	1-1/16	26.98	.84	21.33	1.24	31.49	.96	24.4
7/8	22.22	1-3/16	30.16	.94	23.88	1.34	34.04	1.02	25.9
1	25.40	1-3/8	34.92	1.03	26.16	1.51	38.35	1.23	31.2

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PLUG



7121 L Plug - Plugging Unused Port of Fitting (Metric)

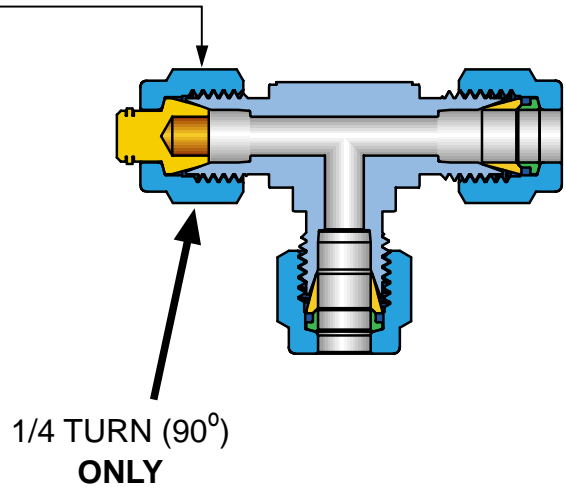
A	W	
	Width Across Hex.	
mm	mm	in
3	12	—
4	12	—
6	14	9/16
8	16	5/8
10	19	3/4
12	22	7/8
15	25	1
16	25	1
18	30	1-3/16
20	32	1-1/4
22	32	1-1/4
25	38	—

7121 L Plug - Plugging Unused Port of Fitting (Inch)

A	W		
	Width Across Hex.		
in	mm	in	mm
1/16	1.58	5/16	7.93
1/8	3.17	7/16	11.11
3/16	4.76	1/2	12.70
1/4	6.35	9/16	14.28
5/16	7.93	5/8	15.87
3/8	9.52	11/16	17.46
1/2	12.70	7/8	22.22
5/8	15.87	1	25.40
3/4	19.05	1-1/8	28.57
1	25.40	1-1/2	38.10

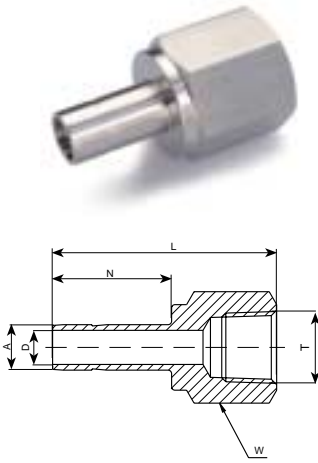
PLUG ASSEMBLY INSTRUCTIONS

7121L XX XX



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FEMALE ADAPTER
TUBE TO PIPE



739 LF Female Adapter - Tube (Metric) Female Pipe

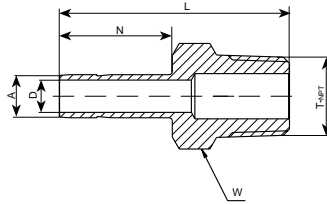
A Tube O.D. mm	T (NPT) inch	D		W Width Across Hex.		N		L	
		mm	mm	mm	in	mm	mm	mm	mm
3	1/8	1.8	14.0	9/16	13.5	31.3			
3	1/4	1.8	19.0	3/4	13.5	34.1			
4	1/8	2.4	14.0	9/16	14.2	32.0			
4	1/4	2.4	19.0	3/4	14.2	34.8			
6	1/8	4.6	14.0	9/16	15.7	32.5			
6	1/4	4.6	19.0	3/4	15.7	37.1			
6	3/8	4.6	22.0	7/8	15.7	39.6			
6	1/2	4.6	27.0	1-1/16	15.7	37.1			
8	1/8	6.4	14.0	9/16	16.5	34.3			
8	1/4	6.4	19.0	3/4	16.5	37.6			
10	1/8	7.1	14.0	9/16	17.3	35.3			
10	1/4	7.7	19.0	3/4	17.3	38.1			
10	3/8	7.7	22.0	7/8	17.3	40.1			
10	1/2	7.7	27.0	1-1/16	17.3	46.5			
12	1/4	9.1	19.0	3/4	22.8	43.7			
12	3/8	9.5	22.0	7/8	22.8	46.7			
12	1/2	9.1	27.0	1-1/16	22.8	52.3			
16	3/8	12.7	22.0	7/8	24.4	48.3			
16	1/2	12.7	27.0	1-1/16	24.4	53.9			
16	3/4	12.7	32.0	1 1/4	24.4	55.4			
20	1/2	15.1	27.0	1-1/16	24.4	53.9			
20	3/4	15.1	32.0	1-1/4	24.4	55.4			
20	1	15.1	41.0	1-5/8	24.4	62.5			
22	3/4	17.0	32.0	1-1/4	26.2	57.2			
25	3/4	23.7	32.0	1-1/4	30.7	61.7			
25	1	23.7	41.0	1-5/8	30.7	68.8			

739 LF Female Adapter - Tube (Inch) Female Pipe

A Tube O.D. in	mm	T (NPT) in	D		W Width Across Hex.		N		L	
			in	mm	in	mm	in	mm	in	mm
1/8	3.17	1/8	.09	2.3	9/16	14.28	.53	13.46	1.24	31.5
1/8	3.17	1/4	.09	2.3	3/4	19.05	.53	13.46	1.39	35.3
3/16	4.76	1/8	.12	3.04	9/16	14.28	.56	14.22	1.26	32.00
3/16	4.76	1/4	.12	3.04	3/4	19.05	.56	14.22	1.41	35.8
1/4	6.35	1/8	.198	4.83	9/16	14.28	.62	15.74	1.30	33.02
1/4	6.35	1/4	.198	4.83	3/4	19.05	.62	15.74	1.46	37.08
1/4	6.35	3/8	.19	4.83	7/8	22.22	.62	15.74	1.55	39.37
1/4	6.35	1/2	.19	4.83	1-1/16	26.98	.62	15.74	1.79	45.46
5/16	7.93	1/8	.25	6.35	9/16	14.28	.65	16.51	1.35	34.29
5/16	7.93	1/4	.25	6.35	3/4	19.05	.65	16.51	1.48	37.6
3/8	9.52	1/8	.28	7.11	9/16	14.28	.68	17.27	1.35	34.3
3/8	9.52	1/4	.28	7.11	3/4	19.05	.68	17.27	1.50	38.10
3/8	9.52	3/8	.28	7.11	7/8	22.22	.68	17.27	1.59	40.4
3/8	9.52	1/2	.28	7.11	1-1/16	26.98	.68	17.27	1.84	46.73
1/2	12.70	1/4	.39	9.90	3/4	19.05	.90	22.86	1.71	43.43
1/2	12.70	3/8	.39	9.90	7/8	22.22	.90	22.86	1.79	45.47
1/2	12.70	1/2	.39	9.90	1-1/16	26.98	.90	22.86	2.04	51.82
5/8	15.87	3/8	.50	12.70	7/8	22.22	.96	24.38	1.90	48.26
5/8	15.87	1/2	.50	12.70	1-1/16	26.98	.96	24.38	2.09	53.08
5/8	15.87	3/4	.50	12.70	1-1/4	31.75	.96	24.38	2.18	55.37
3/4	19.05	1/2	.59	14.98	1-1/16	26.98	.96	24.38	2.08	52.8
3/4	19.05	3/4	.59	14.98	1-5/16	31.75	.96	24.38	2.16	54.86
3/4	19.05	1	.59	14.98	1-5/8	41.27	.96	24.38	2.30	58.42
7/8	22.22	3/4	.68	17.27	1-1/4	31.75	1.03	26.16	2.25	57.15
1	25.40	3/4	.80	20.32	1-1/4	31.75	1.21	30.73	2.39	60.7
1	25.40	1	.80	20.32	1-5/8	41.27	1.21	30.73	2.53	64.26

"D" - Dimension is minimum opening.
Dimensions are for reference only,
and are subject to change without notice.

**MALE ADAPTER
TUBE TO PIPE**



739 LM Male Adapter - Tube (Metric) Male Pipe

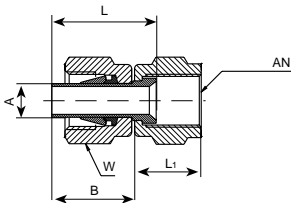
A Tube O.D. mm	T (NPT) in	D mm	W Width Across Hex. mm	N mm	L mm
3	1/8	1.8	11.0	13.5	28.5
3	1/4	1.8	14.0	13.5	33.3
4	1/8	2.4	11.0	14.2	29.2
4	1/4	2.4	14.0	14.2	34.0
6	1/8	4.6	11.0	15.7	32.8
6	1/4	4.6	14.0	15.7	38.1
6	3/8	4.6	17.0	15.7	36.3
6	1/2	4.6	22.0	15.7	41.9
8	1/8	6.4	11.0	16.5	31.8
8	1/4	6.4	14.0	16.5	39.1
10	1/8	7.1	11.0	17.3	33.3
10	1/4	7.1	14.0	17.3	39.9
10	3/8	7.7	17.0	17.3	40.6
10	1/2	7.7	22.0	17.3	46.2
12	1/4	7.1	14.0	22.9	46.5
12	3/8	9.5	17.0	22.9	44.5
12	1/2	9.1	22.0	22.9	52.0
16	3/8	12.7	17.0	24.4	46.0
16	1/2	12.7	22.0	24.4	50.1
16	3/4	12.7	27.0	24.4	51.6
20	1/2	15.1	22.0	24.4	50.8
20	3/4	15.1	27.0	24.4	51.6
20	1	15.1	35.0	24.4	57.9
22	3/4	17.0	27.0	26.2	53.1
25	3/4	19.6	27.0	30.8	57.9
25	1	19.6	35.0	30.8	65.1

739 LM Male Adapter - Tube (Inch) Male Pipe

A Tube O.D. in mm	T (NPT) in	D in mm	W Width Across Hex. in mm	N in mm	L in mm
1/8 3.17	1/8 .09	2.28	7/16 11.11	.53 13.46	1.16 29.46
1/8 3.17	1/4 .09	2.28	9/16 14.28	.53 13.46	1.37 34.8
3/16 4.76	1/8 .12	3.04	7/16 11.11	.56 14.22	1.19 30.22
3/16 4.76	1/4 .12	3.04	9/16 14.28	.56 14.22	1.40 35.56
1/4 6.35	1/8 .19	4.83	7/16 11.11	.62 15.74	1.25 31.75
1/4 6.35	1/4 .19	4.83	9/16 14.28	.62 15.74	1.46 37.08
1/4 6.35	3/8 .19	4.83	11/16 17.46	.62 15.74	1.49 37.85
1/4 6.35	1/2 .19	4.83	7/8 22.22	.62 15.74	1.71 43.43
5/16 7.93	1/8 .25	6.35	7/16 11.11	.65 16.51	1.29 32.76
5/16 7.93	1/4 .25	6.35	9/16 14.28	.65 16.51	1.50 38.1
3/8 9.52	1/8 .28	7.11	7/16 11.11	.68 17.27	1.32 33.53
3/8 9.52	1/4 .28	7.11	9/16 14.28	.68 17.27	1.53 38.86
3/8 9.52	3/8 .28	7.11	11/16 17.46	.68 17.27	1.56 39.62
3/8 9.52	1/2 .28	7.11	7/8 22.22	.68 17.27	1.78 45.21
1/2 12.70	1/4 .39	9.90	9/16 14.28	.90 22.86	1.75 44.45
1/2 12.70	3/8 .39	9.90	11/16 17.46	.90 22.86	1.78 45.21
1/2 12.70	1/2 .39	9.90	7/8 22.22	.90 22.86	20.0 50.8
5/8 15.87	3/8 .50	12.70	11/16 17.46	.96 24.38	1.81 50.8
5/8 15.87	1/2 .50	12.70	7/8 22.22	.96 24.38	2.06 52.34
5/8 15/87	3/4 .50	12.70	1-1/16 26.98	.96 24.38	2.03 52.34
3/4 19.05	1/2 .59	14.98	7/8 22.22	.96 24.38	2.06 52.34
3/4 19.05	3/4 .59	14.98	1-1/16 26.98	.96 24.38	2.06 52.34
3/4 19.05	1 .59	14.98	1-3/8 34.92	.96 24.38	2.28 52.34
7/8 22.22	3/4 .68	17.27	1-1/16 26.98	1.03 26.16	2.09 52.34
1 25.40	3/4 .80	20.32	1-1/16 26.98	1.21 30.73	2.31 58.67
1 25.40	1 .80	20.32	1-3/8 34.92	1.21 30.73	2.60 66.04

"D" - Dimension is minimum opening.
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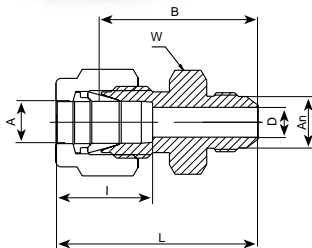
LET-LOK TO AN ADAPTER



761 LFL LET-LOK® to AN Adapter

A Tube O.D.		AN Tube Flare Size		W Width Across Hex.		L		L ₁		B	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/8	3.17	1/8	3.17	3/8	9.52	.73	18.54	.54	13.71	.53	13.46
1/8	3.17	1/4	6.35	9/16	14.28	.75	19.05	.62	15.74	.53	13.46
1/4	6.35	1/4	6.35	9/16	14.28	.84	21.33	.62	15.74	.62	15.75
3/8	9.52	3/8	9.52	11/16	17.46	.98	24.89	.72	21.59	.69	17.53
1/2	12.70	1/2	12.70	7/8	22.22	1.25	31.75	.85	21.59	.91	23.1

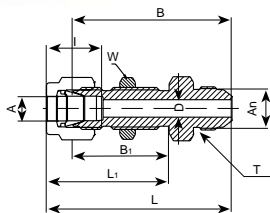
LET-LOK TO AN UNION



762 LFL LET-LOK® to AN Union - Tube (Inch) to Tube (Inch)

A Tube O.D.		AN Tube Flare Size		D		W Width Across Hex.		B		L		I		T Straigh Threa
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	
1/16	1.58	1/8	3.17	.05	1.27	7/16	11.11	0.92	23.36	1.07	27.18	.43	10.92	5/16-24
1/8	3.17	1/8	3.17	.06	1.52	7/16	11.11	1.01	25.65	1.27	32.26	.60	15.24	5/16-24
1/8	3.17	1/4	6.35	.09	2.28	1/2	12.70	1.12	28.44	1.38	35.05	.60	15.24	7/16-20
1/4	6.35	1/4	6.35	.17	4.31	1/2	12.70	1.19	30.22	1.48	37.59	.70	17.78	1/16-20
3/8	9.52	1/4	6.35	.17	4.31	5/8	15.87	1.27	32.25	1.56	39.62	.76	19.30	7/16-20
3/8	9.52	3/8	9.52	.28	7.11	5/8	15.87	1.27	32.25	1.56	39.62	.76	19.30	9/16-18
1/2	12.70	1/2	12.70	.39	9.90	13/16	20.63	1.41	35.8	1.80	45.72	.86	21.84	3/4-16
3/4	19.05	3/4	19.05	.61	15.49	1-1/8	28.57	1.70	43.18	2.10	53.34	.86	21.84	1-1/16-12
1	25.40	1	25.40	.84	21.34	1-3/8	34.92	1.94	49.28	2.42	61.47	1.04	26.42	1-5/16-12

LET-LOK to AN Bulkhead Union

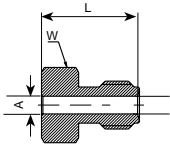


774 LFL LET-LOK® to AN Bulkhead Union - Tube (Inch) to Tube (Inch)

A Tube O.D.		AN Tube Flare Size		D		W Width Across Hex.		B		B ₁		L		L ₁		T Straight Thread	Panel Hole Drill Size	Max. Panel Thickness	I			
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm			
1/4	6.35	1/4	6.35	.19	4.82	5/8	15.87	1.83	46.48	1.03	26.16	2.12	53.84	1.32	33.52	7/16-20	29/64	11.50	11.50	10.16	0.6	15.2
3/8	9.52	3/8	9.52	.28	7.11	3/4	19.05	1.96	49.78	1.16	29.46	2.25	57.15	1.45	36.83	9/16-18	37/64	14.68	14.68	11.17	0.66	16.8
1/2	12.70	1/2	12.70	.39	9.90	15/16	23.81	2.19	55.63	1.25	31.75	2.59	65.79	1.65	41.91	3/4-16	49/64	19.45	19.45	12.70	0.90	22.9
3/4	19.05	3/4	19.05	.61	15.49	1-3/16	30.16	2.71	68.83	1.47	37.34	3.11	78.99	1.87	47.5	1-1/16-12	1-1/64	25.80	25.80	16.76	0.96	24.4
1	25.40	1	25.40	.84	21.33	1-5/8	41.27	3.16	80.26	1.78	45.21	3.64	92.46	2.26	57.4	1-5/16-12	1-21/64	33.73	33.73	19.05	1.23	31.2

"D" - Dimension is minimum opening.
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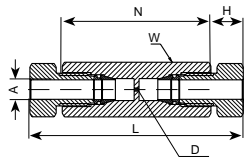
MALE NUT



961 L Male Nut (Inch)

A		W		L	
Tube O.D.		Width Across Hex			
in	mm	in	mm	in	mm
1/16	1.58	1/4	6.35	3/8	9.52

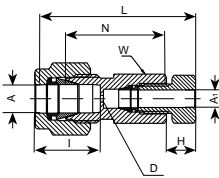
UNION



962 L Union (Inch)

A		D		W		N		H		L		Dead Space
Tube O.D.				Width Across								
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	
1/16	1.58	0.013	0.33	1/4	6.35	0.84	21.34	0.2	5.08	1.25	31.75	6.6 x 10 ⁻⁵ cc

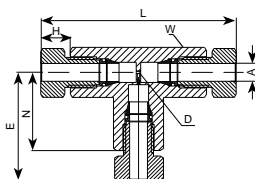
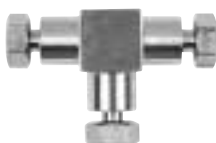
REDUCING UNION



963 L Reducing Union (Inch)

A		A ₁		D		W		N		L		H		I		Dead Space
Tube O.D.		Tube O.D.				Width Across Hex.										
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	
1/4	6.35	1/16	1.58	.013	0.33	1/2	12.70	.75	19.05	1.24	31.50	.20	5.08	0.6	15.2	6.8 x 10 ⁻⁵ cc
3/8	9.52	1/16	1.58	.013	0.33	5/8	15.87	.81	20.57	1.30	33.02	.20	5.08	0.66	16.8	6.8 x 10 ⁻⁵ cc

UNION TEE



964 L Union Tee (Inch)

A		D		W		N		H		E		L		Dead Space
Tube O.D.				Width Across Hex.										
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	
1/16	1.58	.013	0.33	5/16	7.93	0.45	11.43	0.20	5.08	0.65	16.51	1.30	33.02	2.8 x 10 ⁻⁴ cc

"D" - Dimension is minimum opening.

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POSITIONABLE
Per SAE J1926 and MS 16142



DOUBLE FERRULE FITTINGS

769 LOB Male Elbow Tube to SAE/MS Straight Thread Boss (Positionable)*

A	T	D	W	Wa	N	E	E1	L	M	I	O-RING**
Tube O.D.	SAE / MS		Width	Width							DASH No.
in mm	in	in mm	in mm	in mm	in	in mm	in mm	in mm	in mm	in mm	
1/4 6.35	7/16-20	0.19 4.8	1/2 12.7	9/16 14.3	0.83 21.1	1.12 28.5	1.12 28.5	0.39 9.9	0.65 16.5	0.60 15.2	904

769 LOB 45° Male Elbow Tube to SAE/MS Straight Thread Boss (Positionable)*

A	T	D	W	Wa	N	E	E1	L	M	I	O-RING**
Tube O.D.	SAE / MS		Width	Width							DASH No.
in mm	in	in mm	in mm	in mm	in	in mm	in mm	in mm	in mm	in mm	
3/8 9.53	9/16-18	0.28 7.1	13/16 20.6	11/16 17.5	0.81 20.6	1.10 28.0	1.06 27.0	0.39 10.0	0.79 20.1	0.66 16.8	906

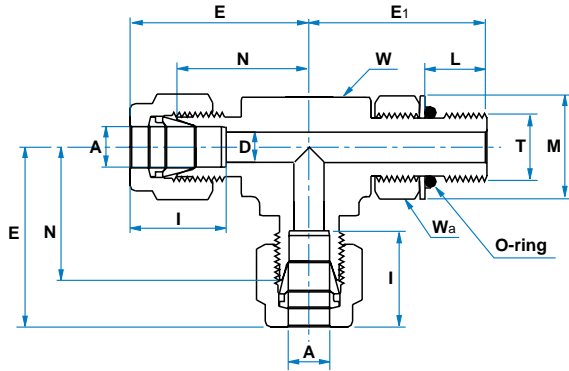
* Per B.S. 2779

** O-rings used are Viton 90 Durometer. Other O-rings materials are available on request. For more technical information see page 045.

Dimensions are for reference only, and are subject to change without notice.

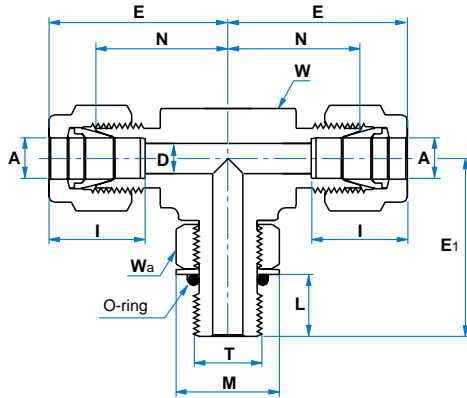
771 LOB Male Run Tee Tube to SAE/MS Straight Thread Boss (Positionable)*

Tube O.D.	SAE / MS	D	W	Wa	N	E	E1	L	M	I	O-RING**										
in mm	in	in mm	Width Across hex in mm	Width Across hex in mm	in mm	in mm	in mm	in mm	in mm	in mm	DASH No.										
1/4	6.35	7/16-20	0.19	4.8	1/2	12.7	9/16	14.3	0.83	21.1	1.12	28.5	1.12	28.5	0.39	9.9	0.65	16.5	0.60	15.2	904



772 LOB Male Branch Tee Tube to SAE/MS Straight Thread Boss (Positionable)*

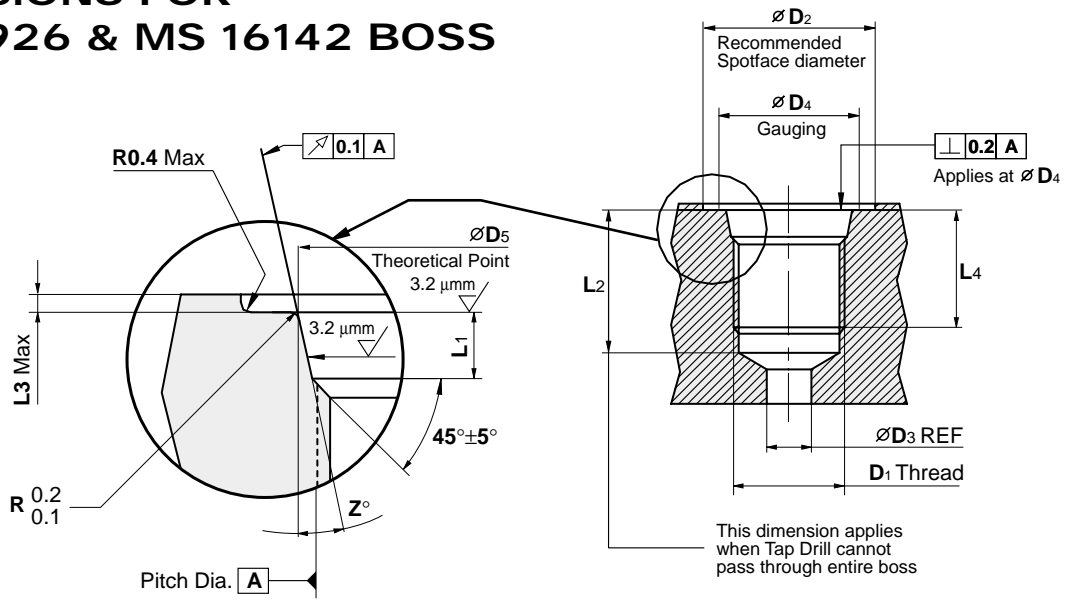
Tube O.D.	SAE / MS	D	W	Wa	N	E	E1	L	M	I	O-RING**										
in mm	in	in mm	Width Across hex in mm	Width Across hex in mm	in mm	in mm	in mm	in mm	in mm	in mm	DASH No.										
1/4	6.35	7/16-20	0.19	4.8	1/2	12.7	9/16	14.3	0.83	21.1	1.12	28.5	1.12	28.5	0.39	9.9	0.65	16.5	0.60	15.2	904



* Per B.S. 2779

** O-rings used are Viton 90 Durometer. Other O-rings materials are available on request. For more technical information see page 045. Dimensions are for reference only, and are subject to change without notice.

DIMENSIONS FOR SAE J1926 & MS 16142 BOSS

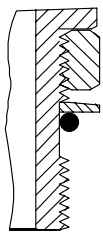


MOUNTING DIMENSIONS FOR O-SEAL CONNECTORS (SAE/MS)

Tube O.D.		DI	D2	D3	D4	D5	L1	L2	L3	L4	Z°
Inch	mm	Thread Size Inch	Min Diameter ±0.05	Min Diameter mm	Min mm	± 0.05 mm	± 0.02 mm	Min mm	Max mm	Min Full Thread mm	± 1° mm
1/8	3.18	5/16 - 24 UNF - 2B	17	1.6	11	9.15	2.1	12	1.6	10	12
3/16	4.76	3/8 - 24 UNF - 2B	19	3.5	13	10.75	2.1	12	1.6	10	12
1/4	6.35	7/16 - 20 UNF - 2B	21	4.5	15	12.45	2.6	14	1.6	11.5	12
5/16	7.94	1/2 - 20 UNF - 2B	23	6	16	14.05	2.6	14	1.6	11.5	12
3/8	9.52	9/16 - 18 UNF - 2B	25	7.5	18	15.70	2.7	15.5	1.6	12.7	12
1/2	12.70	3/4 - 16 UNF - 2B	30	10	22	20.65	2.7	17.5	2.4	14.3	15
5/8	15.88	7/8 - 14 UNF - 2B	34	12.5	26	24	2.7	20	2.4	16.7	15
3/4	19.05	1-1/16 - 12 UNF - 2B	41	16	32	29.2	3.5	23	2.4	19	15
7/8	22.22	1-3/16 - 12 UN - 2B	45	18	35	32.4	3.5	23	2.4	19	15
1	25.40	1-5/16 - 12 UN - 2B	49	21	38	35.55	3.5	23	3.2	19	15

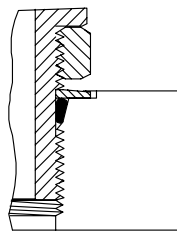
INSTALLATION INSTRUCTIONS:

Figure 1
Locking backed off



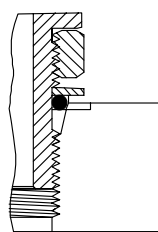
Lubricate O-ring by inserting it in the groove adjacent to the face of the metal back-up washer which is assembled at the extreme end of the groove as shown in figure 1.

Figure 2
Fitting install hand tight



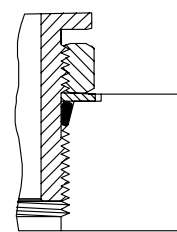
Install the fitting into the S.A.E. straight thread boss, figure 2, until the metal back-up washer contacts the face of the boss as shown in figure 2.

Figure 3
Fittings backed - off for alignment (1 turn maximum)



Position the fitting by turning the counter clockwise up to maximum of one turn (see figure 3).

Figure 4
Fitting locknut tight to appropriate torque

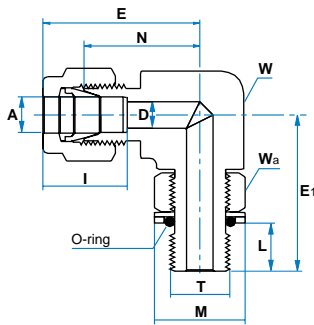


Holding the pad of the the fitting with a spanner, tighten the locknut and washer against the face as shown in figure 4.

POSITIONABLE ISO
Parallel Thread



DOUBLE FERRULE FITTINGS



769 LG Male Elbow Tube (Inch) to ISO Parallel Thread (Positionable)*

A	T	D	W	Wa	N	E	E1	L	M	I	O-RING** I.D.	Washer										
Tube O.D.	(ISO)		Width	Width							DASH No.	mm										
in	mm	in	mm	mm	in	mm	in	mm	in	mm	in	mm										
1/4	6.35	1/8-28 BSPP	0.16	4.0	1/2	12.7	9/16	14.3	0.77	19.6	1.06	26.9	1.04	26.4	0.32	8.1	0.68	17.3	0.60	15.3	8.0	17.3x1.1

769 LG Male Elbow Tube (Metric) to ISO Parallel Thread (Positionable)*

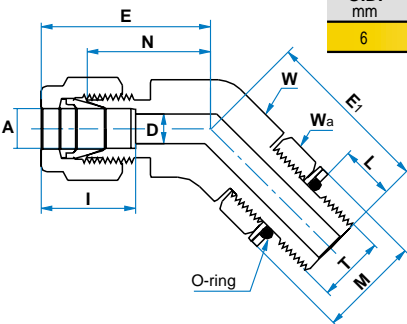
A	T	D	W	Wa	N	E	E1	L	M	I	O-RING** I.D.	Washer		
Tube O.D.	(ISO)		Width	Width							DASH No.	mm		
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
6	1/8-28 BSPP	4.0	1/2	12.7	9/16	14.3	19.6	26.9	26.4	8.1	17.3	15.3	8.0	17.3x1.1

769 LG 45° Male Elbow Tube (Inch) to ISO Parallel Thread (Positionable)*

A	T	D	W	Wa	N	E	E1	L	M	I	O-RING** I.D.	Washer										
Tube O.D.	(ISO)		Width	Width							DASH No.	mm										
in	mm	in	mm	mm	in	mm	in	mm	in	mm	in	mm										
1/4	6.35	1/8-28 BSPP	0.16	4.0	9/16	14.3	9/16	14.3	0.69	17.5	0.98	24.9	0.94	24.0	0.32	8.1	0.68	17.3	0.60	15.3	8.0	17.3x1.1

769 LG 45° Male Elbow Tube (Metric) to ISO Parallel Thread (Positionable)*

A	T	D	W	Wa	N	E	E1	L	M	I	O-RING** I.D.	Washer		
Tube O.D.	(ISO)		Width	Width							DASH No.	mm		
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
6	1/8-28 BSPP	4.0	9/16	14.3	9/16	14.3	17.5	24.9	24.0	8.1	17.3	15.3	8.0	17.3x1.1



* Per B.S. 2779

** O-rings used are Viton 90 Durometer. Other O-ring materials are available on request. For more technical information see page 48.

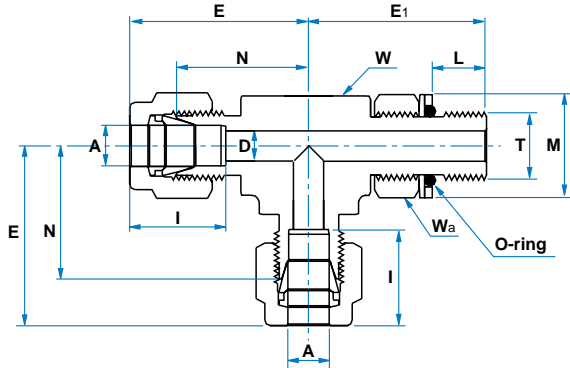
Dimensions are for reference only, and are subject to change without notice.

771 LG Male Run Tee Tube (Inch) to ISO Parallel Thread (Positionable)*

A	T	D	W	Wa	N	E	E1	L	M	I	O-RING**	Washer
Tube O.D.	(ISO)		Width	Width							I.D.	
in mm	in	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	DASH No.	mm
1/4 6.35	1/8-28 BSPP	0.16 4.0	1/2 15.9	9/16 14.3	0.77 19.6	1.06 27	1.04 26.4	0.32 8.1	0.58 17.3	0.50 15.3	8.0	17.3x1.1

771 LG Male Run Tee Tube (Metric) to ISO Parallel Thread (Positionable)*

A	T	D	W	Wa	N	E	E1	L	M	I	O-RING**	Washer
Tube O.D.	(ISO)		Width	Width							I.D.	
mm	in	mm	in mm	in mm	mm	mm	mm	mm	mm	mm	DASH No.	mm
6	1/8-28 BSPP	4.0	1/2 12.7	9/16 14.3	19.5	27.0	26.4	8.1	17.3	15.3	8.0	17.3x1.1

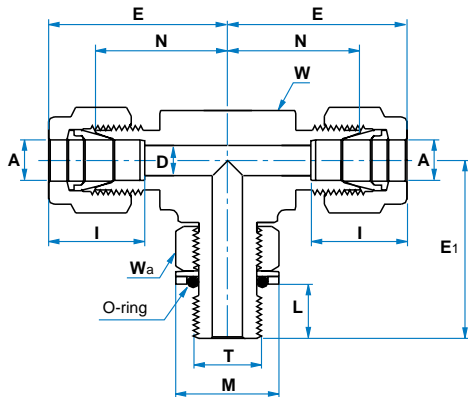


772 LG Male Branch Tee Tube (Inch) to ISO Parallel Thread (Positionable)*

A	T	D	W	Wa	N	E	E1	L	M	I	O-RING**	Washer
Tube O.D.	(ISO)		Width	Width							I.D.	
in mm	in	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	DASH No.	mm
1/4 6.35	1/8-28 BSPP	0.15 4.0	1/2 12.7	9/16 14.3	0.77 19.6	1.06 26.9	1.04 26.4	0.32 8.1	0.68 17.3	0.60 15.3	8.0	17.3x1.1

772 LG Male Branch Tee Tube (Metric) to ISO Parallel Thread (Positionable)*

A	T	D	W	Wa	N	E	E1	L	M	I	O-RING**	Washer
Tube O.D.	(ISO)		Width	Width							I.D.	
mm	in	mm	in mm	in mm	mm	mm	mm	mm	mm	mm	DASH No.	mm
6	1/8-28 BSPP	4.0	1/2 12.7	9/16 14.3	19.6	24.0	26.4	8.1	17.3	15.3	8.0	17.3x1.1

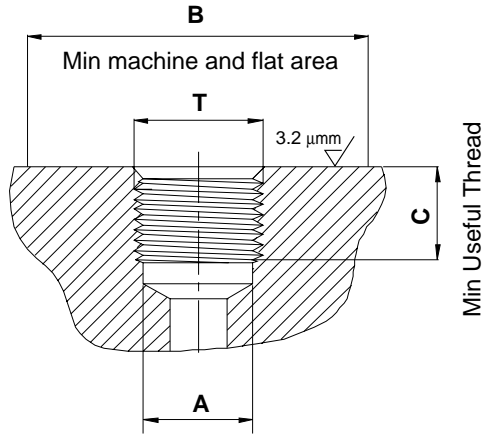


* Per B.S. 2779

** O-rings used are Viton 90 Durometer. Other O-ring materials are available on request. For more technical information see page 48.

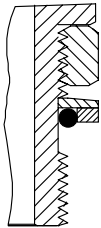
Dimensions are for reference only, and are subject to change without notice.

ISO PARALLEL THREAD PER B.S. 2779



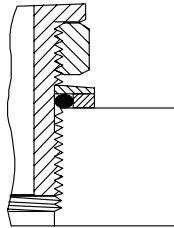
INSTALLATION INSTRUCTIONS

Figure 1
Locking backed off



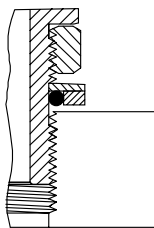
Lubricate O-ring by installing it in the groove adjacent to the face of the metal back-up washer which is assembled at the extreme end of the groove as shown in figure 1.

Figure 2
Fitting install hand tight



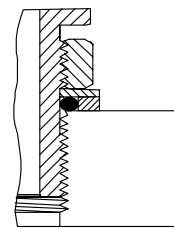
Install the fitting into the straight thread boss, figure 2, until the metal back-up washer contacts the face of the boss as shown in figure 2.

Figure 3
Fittings backed - off for alignment (1 turn maximum)



Position the fitting by turning counter clockwise up to maximum of one turn. see figure 3.

Figure 4
Fitting locknut tight to appropriate torque



Holding the pad of the the fitting with a wrench, tighten the locknut and washer against the face as shown in figure 4.

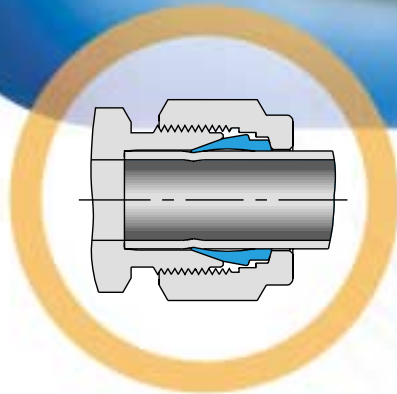
MOUNTING DIMENSIONS CONNECTORS

T Female	A Thread Minor Diameter				B Min Machine and Flat Area		C Min Useful Thread	
	Max		Min.		Inch	mm	Inch	mm
	Inch	mm	Inch	mm				
1/8 - 28	0.35	8.89	0.34	8.64	0.53	13.50	0.28	7.00



ONE-LOK

TUBE FITTINGS 1/16 Through 1 in.



THE PRINCIPLE

ONE-LOK is designed to give you leak-proof, secure connections that can withstand high pressure, vibration and vacuum applications. To this end, ONE-LOK tube fittings are made up of three parts that are precision engineered and machined: body, ferrule and nut.

APPLICATIONS

Ham-Let's ONE-LOK tube fitting is designed for use in control systems, process and instrumentation devices and in industrial

equipment used in various industries such as:

- Pulp & paper mills
- Petroleum process plants
- Chemical process plants
- Chromatography
- Power generation plants

ONE-LOK offers you a simple, high quality tube fitting with excellent performance and reliability.

MATERIALS

Ham-Let's ONE-LOK standard single ferrule fittings are offered

in 316 Stainless Steel. Cold drawn finished bar stock is machined to produce the straight fittings. Close grain forgings are used for the machining of the shaped bodies. For other material options, please contact your Ham-Let distributor or

Ham-Let On-line : www.ham-let.com

REMAKEABILITY

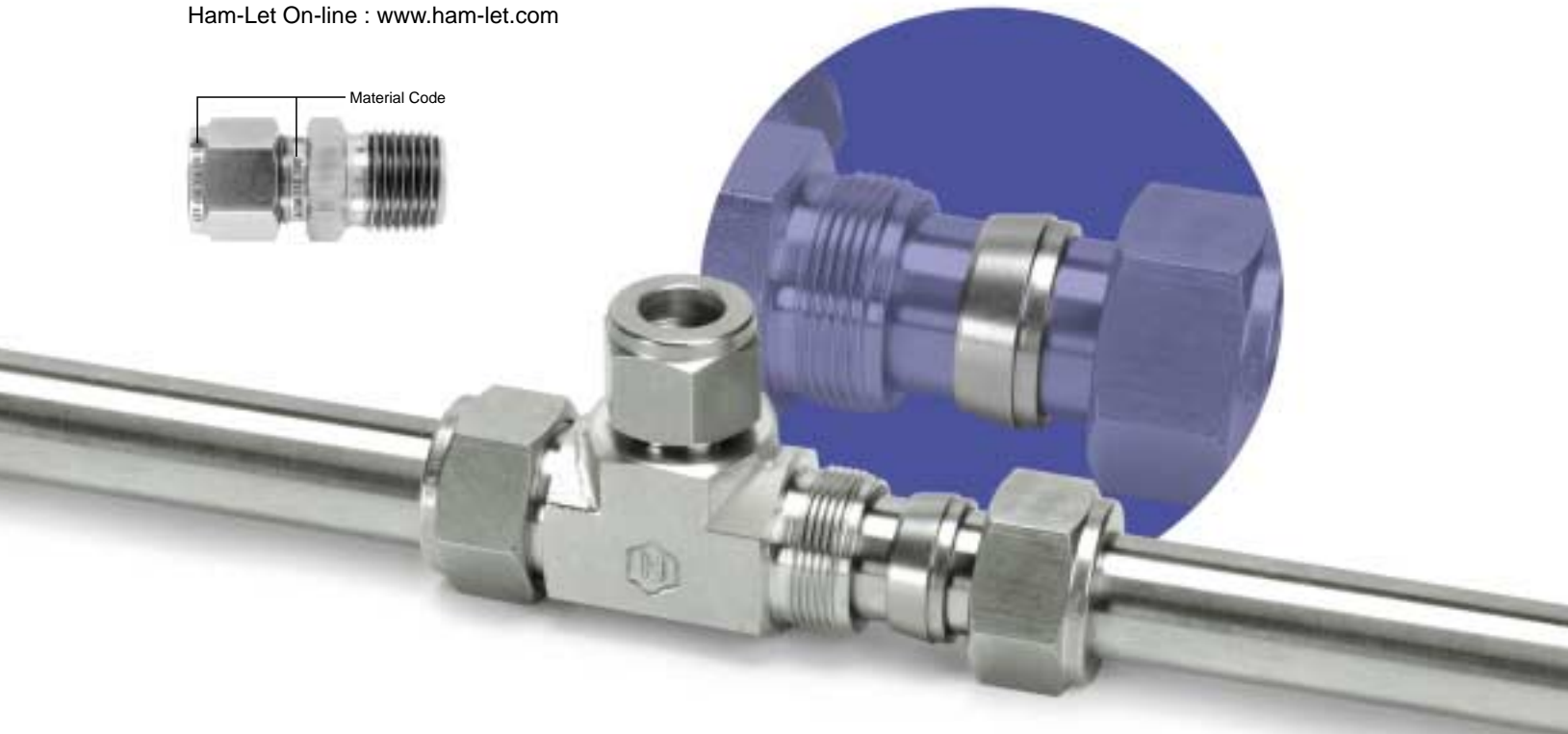
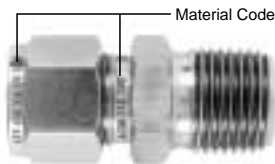
Thanks to the single ferrule design, Ham-Let's ONE-LOK tube fitting continues to perform through repeated remakes; the ONE-LOK single ferrule seal is leak tight - remake after remake.

TEMPERATURE CHANGES

During make-up, the ONE-LOK single ferrule is designed to be able to bow. This action introduces a 'live' element, allowing the device to maintain a leak-tight seal despite expansion and contraction due to temperature changes.

UNIQUE HEAT CODE TRACE NUMBER (MATERIAL CODE)

Ham-Let stamps or etches all ONE-LOK stainless steel body fittings with a unique heat code trace number. This is particularly valuable for critical applications. Full documentation can be made available via this code to trace the SS material back to the original melt or cast.



ONE-LOK TUBING SELECTION

To ensure the installation of safe, leak free systems, it is important to choose the appropriate ONE-LOK single ferrule for your application. ONE-LOK fittings are engineered to the highest standards.

The table below lists tube sizes, which have been tested to bursting pressure with both maximum and minimum wall thickness. Correctly assembled ONE-LOK fittings were installed and no leaks or other failures were noted at the connection points. If you are planning on using tubing that has different wall thicknesses than those noted in this chart, please contact

the Ham-Let Technical Department for advice regarding the appropriate working pressure.

Note: Use fully annealed high quality stainless steel tubing of ASTM A269 or equivalent standard.

Working pressure: Based on laboratory and field tests using ASTM A269 tubing with a safety factor of 4:1 in a metal temperature range of -20° to +100°c.

However, it is the customer's responsibility to ensure safe product selection that is based upon the total system design and function.

TUBING DATA:

Annealed 304 or 316 stainless steel tubing meeting ASTM A213, A269 or equivalent specifications, based on ultimate tensile strength of 75,000 psi (5167 bar), for metal temperatures from -20°F - 100°F (-29°C - 37°C).

Suggested ordering information: Fully annealed high quality (Type 304 or 316) stainless steel hydraulic tubing ASTM A269 or A213 or equivalent, seamless or welded and drawn with a hardness of Rb90 or less. Tubing should be without scratches and suitable for flaring and bending.

Tubing O.D.		WALL THICKNESS OF TUBE IN INCH												
MM	Inch	.010	.012	.014	.016	.020	.028	.035	.049	.065	.083	.095	0.109	0.120
	1/16	5600	6860	8150	9480	12.080								
2	1/8						8550	10950						
3	3/16						5500	7100	10300					
6	1/4						4100	5200	7600	10300				
8	5/16							4100	5900	8100				
10	3/8							3350	4850	6550				
12	1/2							2650	3750	5150	6750			
16	5/8								2950	4050	5250	6050		
20	3/4								2450	3350	4250	4950	5850	
22	7/8								2050	2850	3650	4250	4850	
25	1"									2400	3100	3600	4200	4700

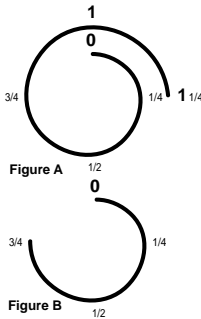
INSTALLATION INSTRUCTIONS



ONE-LOK fittings are supplied assembled, finger tight.

Disassembly before use can allow the entry of dirt or other particles.

1. Insert the tubing into the ONE-LOK fitting. Check that the tube rests firmly on the fitting shoulder and that the nut is finger tight.



2. Tighten the nut. 1 1/4 turns of the nut is required for 1/4" (6 mm) and higher (See Figure A). 3/4 turns of the nut is required for 1/8" (See Figure B).

REASSEMBLY INSTRUCTIONS

ONE-LOK connections may be disconnected and remade repeatedly, without loss of leaktight seal.

1. Before disconnecting, mark the position of the nut in relation to the fitting body.
2. To reassemble, use a wrench to tighten nut to original position.
3. Tighten slightly with wrench until a slight rise in torque is felt.

TUBE CUTTING

Two different methods can be used to cut tubes

1. Tube cutter
2. Hacksaw

TUBE CUTTER

To attain a leak free connection, the tubing must be cut squarely. A good quality tube cutter with the appropriate blade for the tubing material is recommended.

Do not try to reduce the time of cutting by taking deep cuts with each turn of the cutter. This will work harden the tube.

The end of the tube must be deburred to avoid damage to the fitting and to ensure that the tube reaches the bottom of the fitting.

HACKSAW CUTTING

In order to cut the tube with a hacksaw and get square ends, the tube must be cut with guide blocks. This method of cutting necessitates deburring of the tube ends.

Warning

Do not hold the tube in a vise in the place where it will be inserted into the fitting (the vise will leave a mark on the tube that may cause leaks, and might cause ovality).

TUBE HANDLING

Scratches on the tube might cause leaks. It is therefore, important to handle the tube carefully to reduce the risk of leaks.

Some precautions to be taken:

1. Tubes must not be dragged on the floor.
2. Tubes must not be dragged out of a tubing rack, especially in case of large OD tubes.

How to Order:

ONE-LOK fitting part numbers are constructed from symbols that identify the type of material and size of the fitting.

EXAMPLE:

768HL

Fitting type
(male connector)

SS

SS = Stainless Steel

1/4

Tube O.D.

X 1/4

1/4 NPT

The O.D. size is always the first to be described

Pipeline[®]

HAM-LET PRECISION INSTRUMENT PIPE FITTINGS



The HAM-LET Group Ltd.
is pleased to introduce our
line of Precision Instrument Pipe
Fittings.

The Pipeline range of connectors is manufactured for typical applications in chemical and petrochemical processing plants, as well as oil, gas and power generation industries. This fully illustrated catalog contains detailed engineering information, dimensional data and part numbering system.

PIPE LINE® DESCRIPTION

The HAM-LET® Group Ltd. is pleased to introduce our line of Precision Instrument Pipe Fittings.

The Pipeline range of connectors is manufactured for typical applications in chemical and petrochemical processing plants, as well as oil, gas and power generation industries. This fully illustrated catalog contains detailed engineering information, dimensional data and part numbering system.

PIPE LINE® INSTALLATION INSTRUCTION

To ensure a leak tight seal, HAM-LET® recommends the use of a pipe thread sealant on all NPT threads. The most effective sealing method is teflon tape. Tape should be used only on male tapered pipe threads.

Do not use tape on flared, coned or tube fitting ends!

Clean both male and female tapered threads. Wrap tape in the direction of the male tapered thread spiral.

Note: Two wraps are suggested for stainless steel tapered pipe threads. Make sure tape does not overhang the first thread as the tape might shred and enter the fluid system. Cut off excess tape. The connection is now ready for proper makeup.

PIPE LINE® FEATURES

- Sizes range from 1/8" to 1".
- Fittings are properly packaged with the exposed threads protected to ensure they are not damaged during delivery.
- All pipe threads meet the requirements of **ASME/ANSI B1.20.1** (1983) for tapered pipe threads (NPT).
- Working pressures calculated in accordance with Power Piping Code **ANSI B 31.1**, Refiner Piping Code **ASME/ANSI B 31.3** and section VIII of **ASME** Boiler & Pressure Vessel Code.

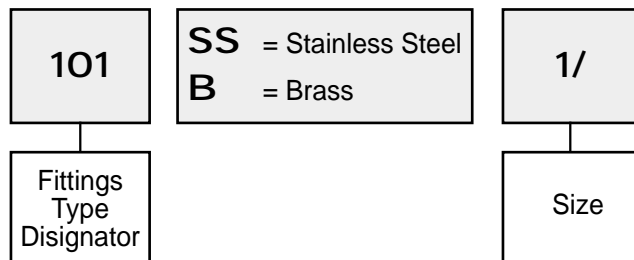
Pressure Ratings (psi)

NPT or BSPT/ISO size	316 STAINLESS STEEL		BRASS	
	Male	Female	Male	Female
1/8	9400	6100	5000	3200
1/4	7500	6200	4000	3300
3/8	7300	5000	3900	2600
1/2	7200	4600	3800	2400
3/4	6800	4300	3600	2300
1	5000	4100	2600	2200

Materials

MATERIALS	SPECIFICATION	
	BARSTOCK	FORGINGS
316 Stainless Steel	ASTM A-276	ASTM A-182
	ASTM A-479	
Brass	ASTM B-453	ASME B-283
	ASTM B-16	
	DIN 176.60	

How to order



Pipeline INDEX

100H 003
 ELBOW

100HM 003
 MALE ELBOW

101H 003
 TEE

101HM 003
 MALE TEE

102H 004
 CROSS

103H 004
 HEX COUPLING

104H 004
 UNION RECORD

108H 005
 PIPE CAP

110H 005
 REDUCING BUSHING

113H 006
 HEX LONG NIPPLE

116H 006
 STREET ELBOW

119H 006
 HEX REDUCING COUPLING

120H 007
 ADAPTER NPT

120HNR 007
 ADAPTER
 NPT Female to Male BSPT

120HNG 008
 ADAPTER
 Female NPT to Male BSPP

120HRN 008
 ADAPTER
 Female BSPT to Male NPT

120HGN 008
 GAUGE ADAPTER
 Female BSPP to Male NPT

121H 009
 PIPE PLUG NPT

122H 009
 HEX NIPPLE

122HNR 009
 HEX NIPPLE
 Male NPT to Male BSPT

122HNG 010
 HEX NIPPLE
 Male NPT to Male BSPP

123H 010
 REDUCING NIPPLE

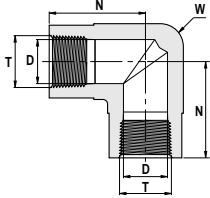
3600H 010
 BRANCH TEE

3750H 011
 STREET TEE

130HM 011
 MALE HOSE CONNECTOR

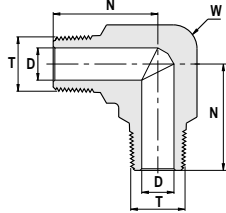
130HF 012
 FEMALE HOSE CONNECTOR

130LT 012
 TUBE TO HOSE CONNECTOR

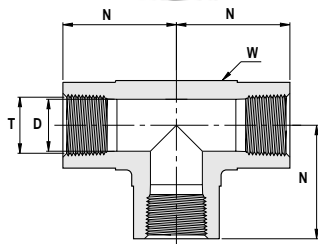
100H Elbow

T Female NPT Size	N		D Min. opening		W Wrench flat
	Inch	mm	Inch	mm	
1/8	1.04	26.4	0.34	8.6	5/8
1/4	1.17	29.7	0.45	11.4	13/16
3/8	1.42	36.1	0.59	15.0	15/16
1/2	1.56	39.6	0.73	18.5	1-1/8
3/4	1.92	48.8	0.94	23.9	1-3/8
1	1.91	48.5	1.17	29.7	1-11/16



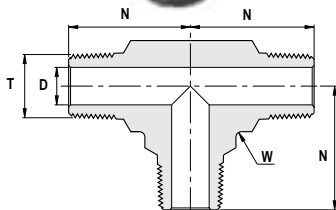
100HM Male Elbow

T Male NPT Size	N		D Min. opening		W Wrench flat
	Inch	mm	Inch	mm	
1/8	0.88	22.4	0.19	4.8	7/16
1/4	1.05	26.7	0.28	7.1	5/8
3/8	1.17	29.7	0.38	9.6	13/16
1/2	1.45	36.8	0.47	11.9	15/16



101H Tee

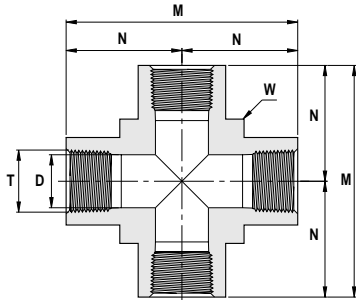
T Female NPT Size	D		D Min. opening		W Wrench flat
	Inch	mm	Inch	mm	
1/8	1.04	26.4	0.34	8.6	5/8
1/4	1.17	29.7	0.45	11.4	13/16
3/8	1.42	36.1	0.59	15.0	15/16
1/2	1.56	39.6	0.73	18.5	1-1/8
3/4	1.92	48.8	0.94	23.9	1-3/8
1	1.91	48.5	1.17	29.7	1-11/16



101HM Male Tee

T Male NPT Size	N		D Min. opening		W Wrench flat
	Inch	mm	Inch	mm	
1/8	0.88	22.4	0.19	4.8	7/16
1/4	1.05	26.7	0.28	7.1	5/8
3/8	1.17	29.7	0.38	9.6	13/16
1/2	1.45	36.8	0.47	11.9	15/16

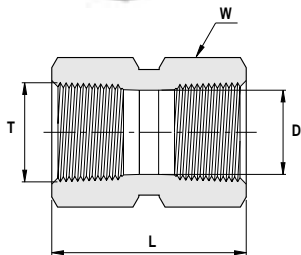
Dimensions are for reference only, and are subject to change without notice.



102H Cross

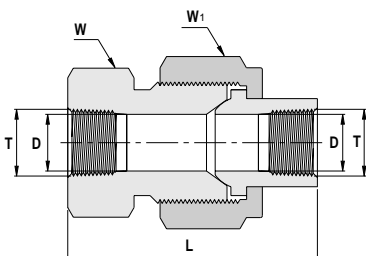
T Female NPT Size	N		M		D Min. opening		W Wrench flat
	Inch	mm	Inch	mm	Inch	mm	Inch
1/8	1.04	26.4	2.08	52.8	0.34	8.6	5/8
1/4	1.17	29.7	2.34	59.4	0.45	11.4	13/16
3/8	1.42	36.1	2.84	72.2	0.59	15.0	15/16
1/2	1.56	39.6	3.12	79.2	0.73	18.5	1-1/8
3/4	1.92	48.8	3.84	97.6	0.94	23.9	1-3/8
1	1.91	48.5	3.82	97.0	1.17	29.7	1-11/16

103H Hex Coupling

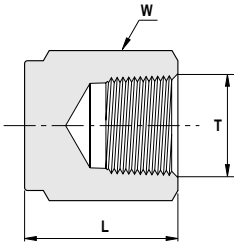


T Female NPT Size	L		D Min. opening		W Hex
	Inch	mm	Inch	mm	Inch
1/8	0.81	20.6	0.34	8.6	9/16
1/4	1.19	30.2	0.45	11.4	3/4
3/8	1.31	33.3	0.59	15.0	7/8
1/2	1.56	39.6	0.73	18.5	1-1/16
3/4	1.62	41.1	0.94	23.9	1-5/16
1	2.00	50.8	1.17	29.7	1-5/8

104H Union Record

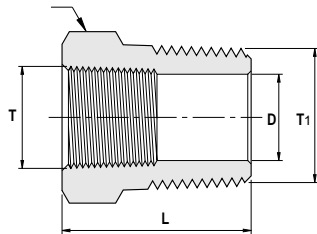


T Female NPT Size	L		D Min opening		W Hex Flat		W1 Hex flat
	Inch	mm	Inch	mm	Inch	mm	Inch
1/8	1.81	46.0	0.27	6.9	15/16	23.81	1-1/8
1/4	2.34	59.4	0.36	9.1	1-3/16	30.16	1-3/8
3/8	2.50	63.5	0.52	13.2	1-5/16	33.34	1-1/2
1/2	2.69	68.3	0.62	15.7	1-5/8	41.28	1-3/4
3/4	3.12	79.2	0.88	22.4	1-7/8	47.63	2
1	3.56	90.4	1.03	26.2	2-3/8	60.33	2-1/2



108H Pipe Cap

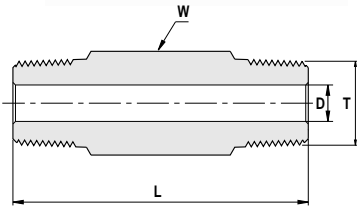
T Female NPT Size	L		W Hex flat Inch
	Inch	mm	
1/8	0.75	19.1	9/16
1/4	0.91	23.1	3/4
3/8	1.03	26.2	7/8
1/2	1.34	34.0	1-1/16
3/4	1.44	36.6	1-5/16
1	1.62	41.1	1-5/8



110H Reducing Bushing

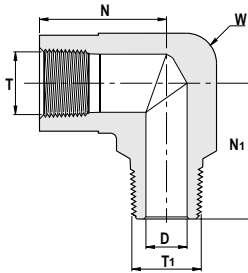
T1 Male NPT Size	T Female NPT Size	L		D Min opening		W Hex Flat Inch
		Inch	mm	Inch	mm	
1/8	1/16	1.03	26.2	0.19	4.8	7/16
1/4	1/8	1.06	26.9	0.28	7.1	9/16
3/8	1/8	0.86	21.8	0.34	8.6	11/16
3/8	1/4	1.19	30.2	0.37	9.5	3/4
1/2	1/8	1.08	27.4	0.34	8.6	7/8
1/2	1/4	1.08	27.4	0.45	11.4	7/8
1/2	3/8	1.41	35.8	0.47	11.9	7/8
3/4	1/4	1.08	27.4	0.45	11.4	1-1/16
3/4	3/8	1.08	27.4	0.59	15.0	1-1/16
3/4	1/2	1.63	41.4	0.62	15.7	1-1/16
1	1/4	1.37	34.8	0.45	11.4	1-3/8
1	3/8	1.37	34.8	0.59	15.0	1-3/8
1	1/2	1.37	34.8	0.73	18.5	1-3/8
1	3/4	1.85	47.0	0.88	22.4	1-3/8
1-1/4	1/2	1.46	37.1	0.73	18.5	1-3/4
1-1/4	3/4	1.47	37.3	0.94	23.9	1-3/4
1-1/4	1	1.94	49.3	1.17	29.7	1-3/4
1-1/2	1/2	1.61	40.9	0.73	18.5	2-1/8
1-1/2	3/4	1.61	40.9	0.94	23.9	2-1/8
1-1/2	1	1.61	40.9	1.17	29.7	2-1/8
1-1/2		2.31	58.7	1.50	38.1	2-1/8
2		1.83	46.5	0.73	18.5	2-3/4
2		1.83	46.5	0.94	23.9	2-3/4
2		1.83	46.5	1.17	29.7	2-3/4
2		1.83	46.5	1.50	38.1	2-3/4
2		1.83	46.5	1.73	43.9	2-3/4

113H Hex Long Nipple



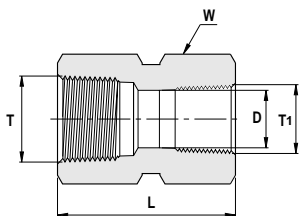
T Male NPT Size	L Available Lengths (inch)					D Hex		W Hex flat Inch
	1.50	2.00	2.50	3.00	4.00	Inch	mm	
1/8	✓	✓	✓	✓	-	0.19	4.8	7/16
1/4	✓	✓	✓	✓	✓	0.28	7.1	9/16
3/8	✓	✓	✓	✓	✓	0.38	9.6	11/16
1/2	-	✓	-	✓	✓	0.47	11.9	7/8
3/4	-	✓	-	✓	✓	0.62	15.8	1-1/16
1	-	-	-	✓	✓	0.88	22.4	1-3/8

116H Street Elbow

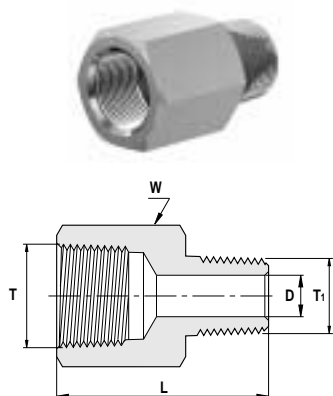


T Female NPT Size	T1 Male NPT Size	N		N1		D Min. opening		W Wrench flat Inch
		Inch	mm	Inch	mm	Inch	mm	
1/16	1/16	0.86	21.8	0.88	22.4	0.12	3.10	7/16
1/8	1/16	1.04	26.4	0.87	22.1	0.12	3.10	5/8
1/8	1/8	1.04	26.4	0.87	22.1	0.19	4.80	5/8
1/4	1/8	1.17	29.7	1.00	25.4	0.19	4.80	13/16
1/4	1/4	1.17	29.7	1.17	29.7	0.28	7.10	13/16
3/8	1/4	1.42	36.1	1.26	32.0	0.28	7.10	15/16
3/8	3/8	1.42	36.1	1.26	32.0	0.38	9.60	15/16
1/2	1/4	1.56	39.6	1.38	35.1	0.28	7.10	1-1/8
1/2	3/8	1.56	39.6	1.38	35.1	0.38	9.60	1-1/8
1/2	1/2	1.56	39.6	1.56	39.6	0.47	11.9	1-1/8
3/4	3/4	1.92	48.8	1.67	42.4	0.62	15.8	1-3/8
1	1	1.91	48.5	1.94	49.3	0.88	22.4	1-11/16

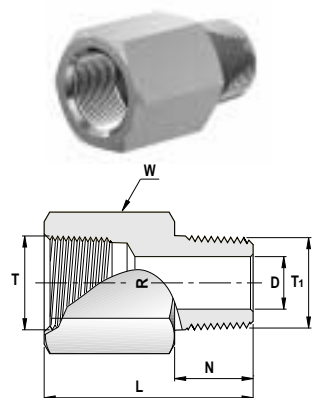
119H Hex Reducing Coupling



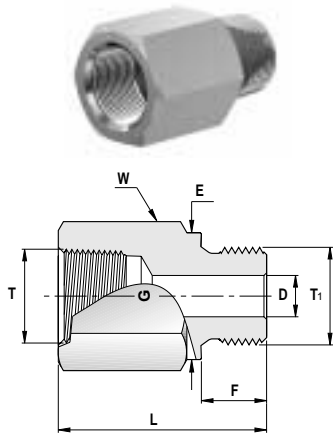
T Female NPT Size	T1 Female NPT Size	L		D Min. opening		W Wrench flat Inch
		Inch	mm	Inch	mm	
1/4	1/8	1.22	31.0	0.34	8.6	3/4
3/8	1/4	1.38	35.1	0.45	11.4	7/8
1/2	1/8	1.56	39.6	0.34	8.6	1-1/16
1/2	1/4	1.75	44.5	0.45	11.4	1-1/16
1/2	3/8	1.78	45.2	0.59	15.0	1-1/16
3/4	1/4	1.81	46.0	0.45	11.4	1-5/16
3/4	1/2	2.06	52.3	0.73	18.5	1-5/16
1	1/2	2.19	55.6	0.73	18.5	1-5/8
1	3/4	2.25	57.2	0.94	23.9	1-5/8

12OH Adapter NPT


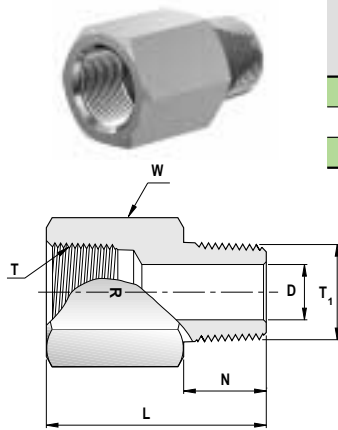
T Female NPT Size	T1 Male NPT Size	L		D Min. opening		W Hex Flat Inch
		Inch	mm	Inch	mm	
1/8	1/16	1.09	27.7	0.12	3.0	9/16
1/8	1/8	1.10	27.9	0.19	4.8	9/16
1/4	1/8	1.26	32.0	0.19	4.8	3/4
1/4	1/4	1.40	35.6	0.28	7.1	3/4
3/8	1/8	1.33	33.8	0.19	4.8	7/8
3/8	1/4	1.50	38.1	0.28	7.1	7/8
3/8	3/8	1.51	38.4	0.38	9.6	7/8
1/2	1/8	1.58	40.1	0.19	4.8	1-1/16
1/2	1/4	1.76	44.7	0.28	7.1	1-1/16
1/2	3/8	1.75	44.5	0.37	9.5	1-1/16
1/2	1/2	1.94	49.3	0.47	11.9	1-1/16
3/4	1/4	1.82	46.2	0.28	7.1	1-5/16
3/4	3/8	1.82	46.2	0.37	9.5	1-5/16
3/4	1/2	2.02	51.3	0.47	11.9	1-5/16
3/4	3/4	2.02	51.3	0.62	15.8	1-5/16
1	1/4	1.96	49.8	0.28	7.1	1-5/8
1	1/2	2.16	54.9	0.47	11.9	1-5/8
1	3/4	2.17	55.1	0.62	15.7	1-5/8
1	1	2.28	57.9	0.88	22.4	1-5/8

12OHNR Adapter NPT to BSPT


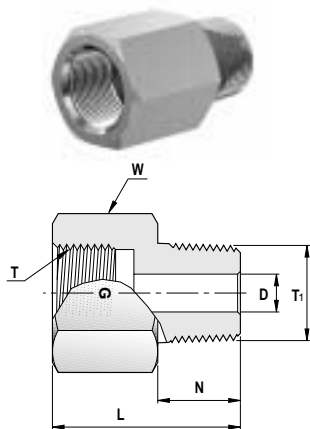
T Female NPT Size	T1 Male BSPT ISO7/1, BS21 Size	L		N		D Min. opening		W Hex flat Inch
		Inch	mm	Inch	mm	Inch	mm	
1/8	1/8-28	1.09	27.7	0.38	9.7	0.19	4.8	9/16
1/4	1/4-19	1.42	36.1	0.56	14.2	0.28	7.1	3/4
3/8	3/8-19	1.50	38.1	0.56	14.2	0.38	9.6	7/8
1/2	1/2-14	1.94	49.3	0.75	19.0	0.47	11.9	1-1/16
3/4	3/4-14	2.02	51.3	0.75	19.0	0.62	15.8	1-5/16
1	1-11	2.30	58.4	0.94	23.9	0.88	22.4	1-5/8

12OHNG Adapter NPT to BSPP


T Female NPT Size	T1 Male BSPP ISO 228/1, BS 2779	L		F		E Dia.		D Min. opening		W Hex Flat
		Inch	mm	Inch	mm	Inch	mm	Inch	mm	
1/8	1/8-28	0.99	25.1	0.28	7.1	0.54	13.8	0.16	4.1	9/16
1/4	1/4-19	1.32	33.5	0.44	11.2	0.70	18.0	0.23	5.8	3/4
3/8	3/8-19	1.41	35.8	0.44	11.2	0.85	21.8	0.31	7.9	7/8
1/2	1/2-14	1.74	44.2	0.56	14.2	1.02	26.0	0.47	11.9	1-1/16
3/4	3/4-14	1.89	48.0	0.62	15.7	1.26	32.0	0.62	15.7	1-5/16
1	1-11	2.10	53.3	0.72	18.3	1.53	39.0	0.78	19.8	1-5/8

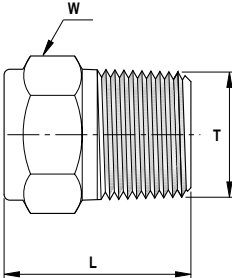
12OHRN Adapter BSPT to NPT


T Female BSPT ISO 7/1, BS 21 Size	T1 Male NPT Size	L		N		D Min opening		W Hex Flat
		Inch	mm	Inch	mm	Inch	mm	
1/4-19	1/4	1.43	36.3	0.56	14.2	0.28	7.1	3/4
3/8-19	3/8	1.51	38.4	0.56	14.2	0.38	9.6	7/8
1/2-14	1/2	1.96	49.8	0.75	19.1	0.47	11.9	1-1/16

12OHGN Gauge Adapter BSPP to NPT


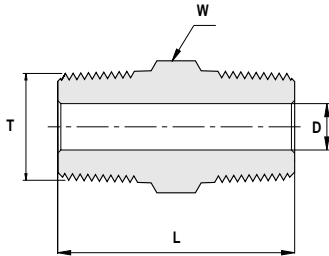
T Female BSPP ISO 228/1, BS 2779 Size	T1 Male NPT Size	L		N		D Min opening		W Hex
		Inch	mm	Inch	mm	Inch	mm	
1/4-19	1/4	1.08	27.4	0.56	14.2	0.22	5.6	3/4
3/8-19	3/8	1.27	32.3	0.56	14.2	0.26	6.6	15/16
1/2-14	1/2	1.65	41.9	0.75	19.1	0.28	7.1	1-1/16

121H Pipe Plug NPT



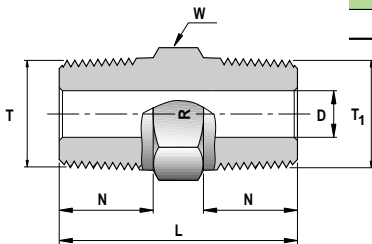
T Male NPT. Size	L		W Hex Flat
	Inch	mm	Inch
1/16	0.75	19.0	5/16
1/8	0.75	19.0	7/16
1/4	0.96	24.4	9/16
3/8	0.99	25.2	11/16
1/2	1.21	30.7	7/8
3/4	1.21	30.7	1-1/16
1	1.50	38.1	1-3/8

122H Hex Nipple



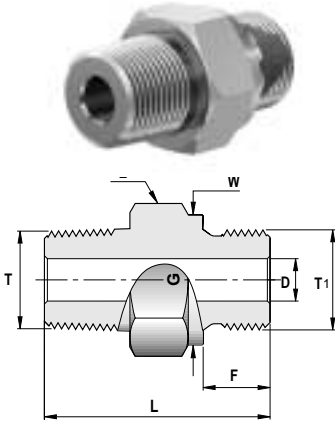
T Male NPT Size	L		D Min. opening		W Hex
	Inch	mm	Inch	mm	Inch
1/16	1.01	25.7	0.12	3.0	5/16
1/8	1.01	25.7	0.19	4.8	7/16
1/4	1.40	35.6	0.28	7.1	9/16
3/8	1.43	36.3	0.38	9.6	11/16
1/2	1.84	46.7	0.47	11.9	7/8
3/4	1.84	46.7	0.62	15.8	1-1/16
1	2.32	58.9	0.88	22.4	1-3/8

122HNR Hex Nipple NPT to BSPT



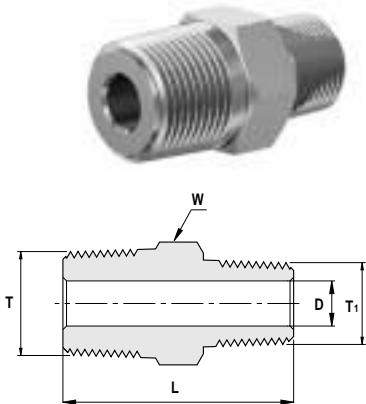
T Male NPT Size	T1 Male BSPT ISO7/1, BS21 Size	L		N		D Min. opening		W Hex Flat
		Inch	mm	Inch	mm	Inch	mm	Inch
1/8	1/8-28	1.01	25.6	0.38	9.7	0.19	4.8	7/16
1/4	1/4-19	1.40	35.6	0.56	14.2	0.28	7.1	9/16
3/8	3/8-19	1.43	36.3	0.56	14.2	0.38	9.6	1-1/16
1/2	1/2-14	1.84	46.7	0.75	19.0	0.47	11.9	7/8
3/4	3/4-14	1.84	46.7	0.75	19.0	0.62	15.8	1-1/16
1	1-11	2.32	58.9	0.94	23.9	0.88	22.4	1-3/8

122HNG Hex Nipple NPT to BSPP



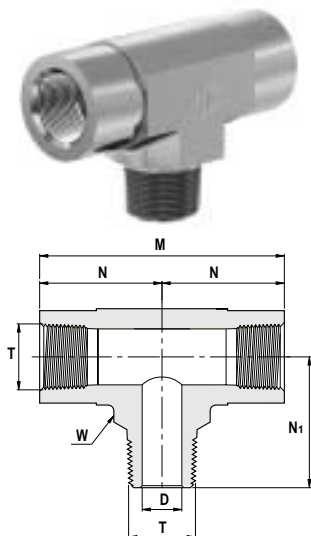
T Male NPT Size	T1 Male BSPP ISO 228/1, BS2779 Size	L		F		E		D Min. opening		W Hex Flat Inch
		Inch	mm	Inch	mm	Inch	mm	Inch	mm	
1/8	1/8-28	1.07	27.2	0.28	7.1	0.54	13.8	0.16	4.1	9/16
1/4	1/4-19	1.44	36.3	0.44	11.2	0.71	18.0	0.23	5.8	3/4
3/8	3/8-19	1.47	37.3	0.44	11.2	0.85	21.8	0.31	7.9	7/8
1/2	1/2-14	1.78	45.2	0.56	14.2	1.02	26.0	0.47	11.9	1-1/16
3/4	3/4-14	1.95	49.5	0.62	15.7	1.26	32.0	0.62	15.8	1-5/16
1	1-11	2.26	57.4	0.72	18.3	1.53	39.0	0.78	19.8	1-5/8

123H Reducing Nipple



T Male NPT Size	T1 Male NPT Size	L		D Min. opening		W Hex Inch
		Inch	mm	Inch	mm	
1/8	1/16	1.01	25.7	0.12	3.0	7/16
1/4	1/8	1.22	31.0	0.19	4.8	9/16
3/8	1/8	1.25	31.8	0.19	4.8	11/16
3/8	1/4	1.43	36.3	0.28	7.1	11/16
1/2	1/8	1.47	37.3	0.19	4.8	7/8
1/2	1/4	1.65	41.9	0.28	7.1	7/8
1/2	3/8	1.65	41.9	0.38	9.6	7/8
3/4	1/4	1.65	41.9	0.28	7.1	1-1/16
3/4	1/2	1.84	46.7	0.47	11.9	1-1/16
1	1/2	2.13	54.1	0.47	11.9	1-3/8
1	3/4	2.13	54.1	0.62	15.8	1-3/8

3600H Branch Tee



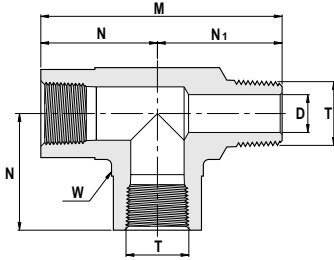
T Male & Female	M		N		N1		D Min. opening		W Wrench Flat Inch
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	
1/8	2.08	52.8	1.04	26.4	0.87	22.1	0.19	4.8	5/8
1/4	2.34	59.4	1.17	29.7	1.17	29.7	0.28	7.1	13/16
3/8	2.68	68.1	1.42	36.1	1.26	32.0	0.38	9.6	15/16
1/2	3.12	79.2	1.56	39.6	1.56	39.6	0.47	11.9	1-1/8

Dimensions are for reference only, and are subject to change without notice.

375OH Street Tee



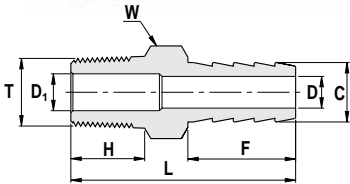
T Male & Female NPT	M		N		N1		D Min. opening		W Wrench flat
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
1/8	1.91	48.5	1.04	26.4	0.87	22.1	0.19	4.8	5/8
1/4	2.34	59.4	1.17	29.7	1.17	29.7	0.28	7.1	13/16
3/8	2.68	68.1	1.42	36.1	1.26	32.0	0.38	9.6	15/16
1/2	3.12	79.2	1.56	39.6	1.56	39.6	0.47	11.9	1-1/8



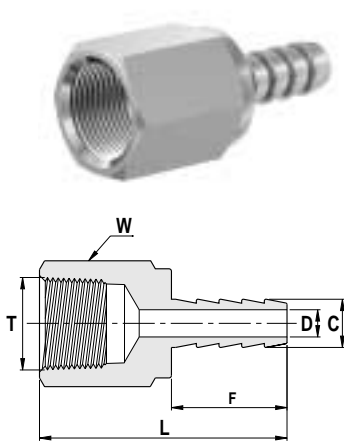
130HM Male to Hose Connector



Hose I.D.	T NPT Size	C		D		D1		F		H		L		W Hex Flat
		Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
1/8	1/8	0.15	3.80	0.08	2.0	0.19	4.80	0.40	10.2	0.38	9.70	1.08	27.4	7/16
1/8	1/4	0.15	3.80	0.08	2.0	0.28	7.10	0.40	10.2	0.56	14.2	1.26	32.0	9/16
3/16	1/8	0.23	5.84	0.12	3.0	0.12	3.00	0.59	15.0	0.38	9.70	1.27	32.3	7/16
3/16	1/4	0.23	5.84	0.12	3.0	0.28	7.10	0.59	15.0	0.56	14.2	1.45	36.8	9/16
1/4	1/8	0.30	7.62	0.19	4.8	0.19	4.80	0.79	20.1	0.38	9.70	1.47	37.3	7/16
1/4	1/4	0.30	7.62	0.19	4.8	0.19	4.80	0.79	20.1	0.56	14.2	1.65	41.9	9/16
1/4	3/8	0.30	7.62	0.19	4.8	0.19	4.80	0.79	20.1	0.56	14.2	1.66	42.2	11/16
1/4	1/2	0.30	7.62	0.19	4.8	0.47	11.9	0.79	20.1	0.75	19.0	1.85	47.0	7/8
5/16	1/8	0.38	9.65	0.19	4.8	0.19	4.80	0.87	22.1	0.38	9.70	1.55	39.4	7/16
5/16	1/4	0.38	9.65	0.19	4.8	0.19	4.80	0.87	22.1	0.56	14.2	1.73	43.9	9/16
5/16	3/8	0.38	9.65	0.19	4.8	0.19	4.80	0.87	22.1	0.56	14.2	1.74	44.2	11/16
5/16	1/2	0.38	9.65	0.19	4.8	0.47	11.9	0.87	22.1	0.75	19.0	1.96	49.8	7/8
3/8	1/4	0.45	11.43	0.30	7.6	0.30	7.60	0.87	22.1	0.56	14.2	1.73	43.9	9/16
3/8	3/8	0.45	11.43	0.30	7.6	0.30	7.60	0.87	22.1	0.56	14.2	1.74	44.2	11/16
3/8	1/2	0.45	11.43	0.30	7.6	0.30	7.60	0.87	22.1	0.75	19.0	1.96	49.8	7/8
1/2	1/4	0.60	15.24	0.37	9.5	0.28	7.10	0.94	23.8	0.56	14.2	1.80	45.7	11/16
1/2	3/8	0.60	15.24	0.37	9.5	0.37	9.50	0.94	23.8	0.56	14.2	1.81	46.0	11/16
1/2	1/2	0.60	15.24	0.37	9.5	0.37	9.50	0.94	23.8	0.75	19.0	2.03	51.6	7/8
5/8	1/2	0.75	19.10	0.47	11.9	0.47	11.9	0.98	24.9	0.75	19.0	2.07	52.6	1-1/16
5/8	3/4	0.75	19.10	0.50	12.7	0.63	16.0	0.98	24.9	0.75	19.0	2.07	52.6	1-1/16
3/4	1/2	0.90	22.86	0.63	16.0	0.47	11.9	1.05	26.7	0.75	19.0	2.14	54.4	1-1/16
3/4	3/4	0.90	22.86	0.63	16.0	0.63	16.0	1.05	26.7	0.75	19.0	2.14	54.4	1-1/16
3/4	1	0.90	22.86	0.63	16.0	0.88	22.4	1.05	26.7	0.94	23.9	2.43	61.7	1-3/8
1	3/4	1.2	30.48	0.88	22.4	0.63	16.0	1.19	30.2	0.75	19.0	2.38	60.5	1-3/8
1	1	1.2	30.48	0.88	22.4	0.88	22.4	1.19	30.2	0.94	23.9	2.57	65.3	1-3/8

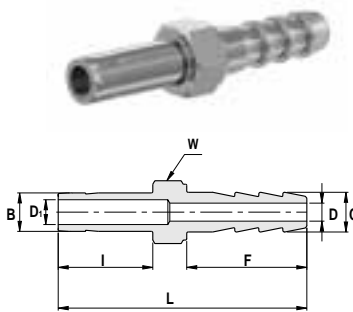


13OHF Female Hose Connector



Hose I.D.	T NPT Size	C		D		F		L Min. opening		W Hex Flat
		Inch	mm	Inch	mm	Inch	mm	Inch	mm	
1/8	1/8	0.15	3.80	0.08	2.00	0.40	10.2	1.11	28.2	9/16
1/8	1/4	0.15	3.80	0.08	2.00	0.40	10.2	1.26	32.0	3/4
3/16	1/8	0.23	5.84	0.12	3.00	0.59	15.0	1.29	32.8	9/16
3/16	1/4	0.23	5.84	0.12	3.00	0.59	15.0	1.44	36.6	3/4
1/4	1/8	0.30	7.62	0.19	4.80	0.79	20.1	1.47	37.3	9/16
1/4	1/4	0.30	7.62	0.19	4.80	0.79	20.1	1.64	41.7	3/4
1/4	3/8	0.30	7.62	0.19	4.80	0.79	20.1	1.71	43.4	7/8
5/16	1/4	0.38	9.65	0.19	4.80	0.87	22.1	1.73	43.9	3/4
5/16	3/8	0.38	9.65	0.19	4.80	0.87	22.1	1.82	46.2	7/8
3/8	1/4	0.45	11.43	0.30	7.60	0.87	22.1	1.69	42.9	3/4
3/8	3/8	0.45	11.43	0.30	7.60	0.87	22.1	1.78	45.2	7/8
3/8	1/2	0.45	11.43	0.30	7.60	0.87	22.1	2.03	51.6	1-1/16
1/2	1/2	0.60	15.24	0.38	9.70	0.94	23.9	2.13	54.1	1-1/16

13OLT Tube to Hose Connector



Hose I.D.	B Tube Size	C		D		D1		F		I		L		W Hex Flat
		Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	
1/8	1/8	0.15	3.80	0.08	2.00	0.09	2.30	0.40	10.2	0.53	13.5	1.35	34.3	5/16
1/8	1/4	0.15	3.80	0.08	2.00	0.19	4.80	0.40	10.2	0.62	15.7	1.44	36.6	3/8
1/4	1/4	0.30	7.62	0.19	4.80	0.19	4.80	0.79	20.1	0.62	15.7	1.83	46.5	7/16
1/4	3/8	0.30	7.62	0.19	4.80	0.28	7.10	0.79	20.1	0.69	17.5	1.90	48.3	7/16
1/4	6mm	0.30	7.62	0.19	4.80	0.18	4.60	0.79	20.1	0.62	15.7	1.86	47.2	7/16
5/16	1/4	0.37	9.40	0.19	4.80	0.19	4.80	0.87	22.1	0.62	15.7	1.91	48.5	7/16
3/8	3/8	0.45	11.43	0.30	7.60	0.28	7.10	0.87	22.1	0.69	17.5	1.98	50.3	9/16
3/8	1/2	0.45	11.43	0.30	7.60	0.39	9.90	0.87	22.1	0.91	23.1	2.20	55.9	5/8
1/2	3/8	0.60	15.24	0.38	9.70	0.28	7.10	0.94	23.9	0.69	17.5	2.05	52.1	11/16
1/2	1/2	0.60	15.24	0.38	9.70	0.39	9.90	0.94	23.9	0.91	23.1	2.27	57.7	11/16
3/4	3/4	0.90	22.86	0.63	16.0	0.59	15.0	1.05	26.7	0.97	24.6	2.44	62.0	1-1/16

37° Flare

3 PIECE TUBE ASSEMBLY



**Stainless Steel High Pressure 37° Flared
Tube Fittings 1/8" to 1 1/2"**

MEETS SAE STANDARD J514



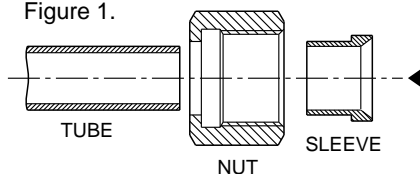
If required, see SAE Standard J514 for a complete list of dimensions. NPT Tapered Pipe Threads meet the requirements of ASME/ANSI B.1.20.1.

All 37° Flared tube fittings-3 piece tube assembly, can be used with metric tube by using a metric 37° sleeve, instead of an inch sleeve. Each dimension table shows which metric sleeve should be used for every size.

ASSEMBLY INSTRUCTION

1. Cut the tube to the proper length.
2. Slide the nut and sleeve onto the tube. (See Fig.1)
3. With a special flaring tool, form the flare to 37° dimension according to SAE STD. J533. (see page 3)
4. Screw the nut onto the body until finger tight.
5. From this position, tighten the nut with a wrench 1/4" turn in order to make a leakproof metal to metal connection.

Figure 1.



TUBING DATA FOR 37° FLARED THREE-PIECE TUBE ASSEMBLY

In order to ensure maximum fitting reliability and performance, great care should be taken when selecting the tube for each application.

Tubing should be a fully annealed, seamless and drawn, suitable for bending and flaring, according to standard ASTM-269, A.I.S.I. 316 or 304.

QUALITY

Lengths of finished tubing should be reasonably straight and have smooth ends free from burrs. Tubing should be free from scale and injurious defects and have a workmanlike finish. Surface imperfections such as handling marks, die marks, or shallow pits will not be considered injurious defects provided the imperfections are within the tolerances specified for diameter and wall thickness. The removal of such imperfections is not required. (Quality SAE J524).

TUBE HANDLING

Scratches on the tube might cause leaks. It is, therefore, important to handle the tube carefully to reduce the risk of leaks.

1. Tubes must not be dragged on the floor.
2. Tubes must not be dragged out of a tubing rack, especially in cases of large OD tubes.

COPPER TUBING

If copper tubing from a roll is used, ensure, the end of the tube is held and the roll moves away with the tubing laying on a flat surface.

TUBE CUTTING

Two different methods can be used to cut tubes:

1. Tube cutter
2. Hacksaw

TUBE CUTTER

To attain a leakfree connection, the tubing must be cut squarely. A good quality tube cutter with the appropriate blade for the tubing material is recommended.

Do not try to reduce the time of cutting by taking deep cuts with each turn of the cutter.

The end of the tube must be deburred to avoid damage to the fitting and to ensure that the tube reaches the bottom of the fitting.

HACKSAW CUTTING

In order to cut the tube with a hacksaw and to attain square ends, the tube must be cut with guide blocks. This method of cutting requires deburring of the tube ends.

WARNING

Do not hold the tube in a vise in the place where it will be inserted into the fitting. The vise will leave a mark on the tube that may cause leaks and might cause ovality.

ASSEMBLY INSTRUCTION

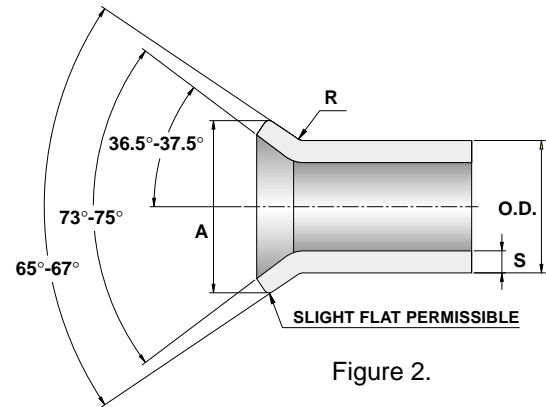


Figure 2.

Perform flaring according to SAE J533. See Fig. 2.
 See Table 1 below for dimensions .

Table 1: Flaring

Nominal Tube O.D.	A Single Flare Diameter				R		S	
	inch		mm		inch	mm	inch	mm
	Max	Min	Max	Min	±0.02	±0.5	Max	mm
1/8	0.20	0.18	5.08	4.58	0.03	0.8	0.035	0.88
3/16	0.28	0.26	7.11	6.61	0.03	0.8	0.035	0.88
1/4	0.36	0.34	9.14	8.64	0.03	0.8	0.065	1.65
5/16	0.43	0.40	10.92	10.16	0.03	0.8	0.065	1.65
3/8	0.49	0.46	12.44	11.69	0.04	1.0	0.065	1.65
1/2	0.66	0.63	16.76	16.01	0.06	1.5	0.083	2.1
5/8	0.79	0.76	20.06	19.31	0.06	1.5	0.095	2.41
3/4	0.95	0.92	24.13	23.37	0.08	2.0	0.109	2.76
7/8	1.07	1.04	27.17	26.42	0.08	2.0	0.109	2.76
1	1.20	1.17	30.48	29.72	0.09	2.3	0.12	3.04
1-1/8	1.38	1.35	35.05	34.29	0.09	2.3	0.12	3.04
1-1/4	1.51	1.48	38.35	37.60	0.09	2.3	0.12	3.04
1-1/2	1.73	1.70	43.94	43.18	0.11	2.8	0.12	3.04

Dimensions are for reference only, and are subject to change without notice.

Table 2: Allowable Working Pressure Ratings (Capable of 4" to 1" min. burst)




Nom. SAE Dash Size	Nom. Tube O.D Inches	37° Flare Straight Thread	Nom. Pipe Size	SAE St.Threads Union and Bulkhead	Fittings with Pipe Threads
2	1/8	5/16" - 24	1/8"	5000	5000
3	3/16	3/8" - 24	1/8"	5000	5000
4	1/4	7/16" - 20	1/8"	5000	5000
5	5/16	1/2" - 20	1/8"	5000	5000
6	3/8	9/16" - 18	1/4"	5000	5000
8	1/2	3/4" - 16	3/8"	4500	4000
10	5/8	7/8" - 14	1/2"	3500	3000
12	3/4	1 1/16" - 12	3/4"	3500	3000
14	7/8	1-3/16" - 12	3/4"	3000	2500
16	1	1-5/16" - 12	1"	3000	2000
20	1-1/4	1-5/8" - 12	1-1/4"	2500	1150
24	1-1/2	1-7/8" - 12	1-1/2"	2000	1000
32	2	2-1/2" - 12	2"	1500	1000

DEBURRING PRIOR TO FLARING

To ensure satisfactory flares are produced, it may be necessary to deburr the tube end prior to flaring. It is usually necessary to break the inside corner smoothly before single flaring, and some non-ferrous tubing to eliminate is normally required to eliminate the cutoff burr which might otherwise create leakage paths across a substantial portion of the flare. It is acceptable to smoothly break the outside corner prior to single flaring, or both outside and inside corners prior to double flaring, on any tube material to minimize splitting.

NOTE:

Since many factors influence the pressure at which a system will or will not perform satisfactorily, values shown in table 2 should not be construed as guaranteed minimum.

740HFSS 04 SLEEVE For 3 piece tube assembly S.A.E. 070115		745HFSS 07 MALE BRANCH TEE S.A.E. 070425		750HFSS 11 FEMALE ELBOW S.A.E. 070203		771HFLSS 14 FEMALE RUN TEE S.A.E. 070426	
741HFSS 04 NUT For 3 piece tube assembly S.A.E. 070110		746HFSS 07 FEMALE CONNECTOR S.A.E. 070103		751HFSS 12 MALE RUN TEE S.A.E. 070424		772HFLSS 15 FEMALE BRANCH TEE S.A.E. 070427	
741HFLSS 05 REDUCING ADAPTOR S.A.E. 070123		748HFSS 08 MALE CONNECTOR S.A.E. 070102		755HFSS 13 UNION ELBOW S.A.E. 070201		7102HFLSS 15 CROSS S.A.E. 070501	
742HFSS 05 UNION S.A.E. 070101		748HOBSS 09 MALE CONNECTOR SAE S.A.E. 0701120		774HFLSS 13 BULKHEAD UNION S.A.E. 070601		7639HFSS 16 TUBE CAP S.A.E. 070109	
742HFLSS 06 LARGE HEX UNION S.A.E. 070119		749HFSS 10 MALE ELBOW S.A.E. 070202		774HFLN 14 BULKHEAD LOCKNUT S.A.E. 070118		7640HFSS 16 PLUG S.A.E. 070112	
744HFSS 06 UNION TEE S.A.E. 070401							

How to Order

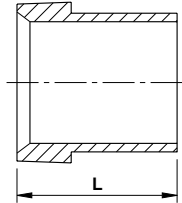
Ham-Let's 37° Flare 3 piece tube assembly fitting part numbers are constructed from symbols that identify the type of material and size of the fitting.

The part number describes a completely assembled fitting from 1/8" O.D. to 2" O.D.

EXAMPLE

748HF	SS = Stainless Steel B = Brass	1/4" 6mm	x	1/4"	BD = Body ASS = Assambled
Fitting type (male Flare 37° connector)		Tube O.D. The O.D. size is always the first to be described		1/4 NPT Pipe thread	

All 37° Flared tube fittings-3 piece tube assembly, can be used with metric tube by using a metric 37° sleeve, instead of an inch sleeve. Each dimension table shows which metric sleeve should be used for every size.

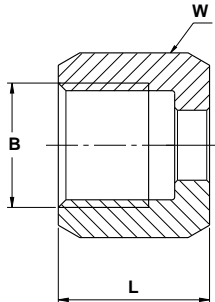
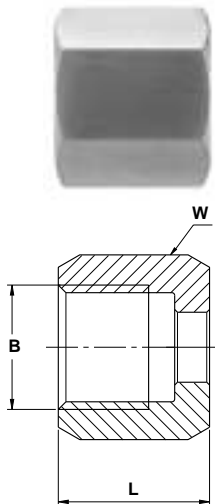
740HFSS Sleeve For 3 Piece Tube Assembly, S.A.E. 070115

Inch Sleeve

Tube O.D.	L	
	inch	mm
1/8	0.34	8.6
3/16	0.34	8.6
1/4	0.41	10.4
5/16	0.44	11.2
3/8	0.5	12.7
1/2	0.56	14.2
5/8	0.66	16.8
3/4	0.68	17.3
7/8	0.76	19.3
1	0.78	19.8
1-1/4	0.91	23.1
1-1/2	1.12	28.4
2	1.19	30.2

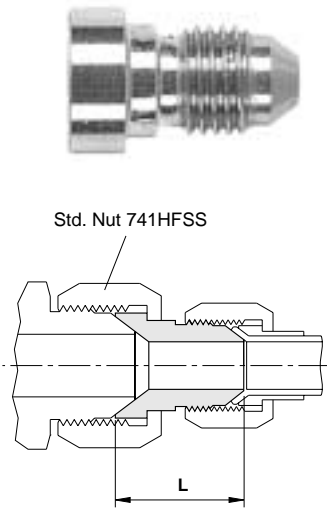
Metric Sleeve

Tube O.D.	L
	mm
-	-
-	-
6	10.4
8	11.2
10	12.7
12	14.2
16	16.8
18	17.3
20	19.3
25	19.8
32	23.1
38	28.4

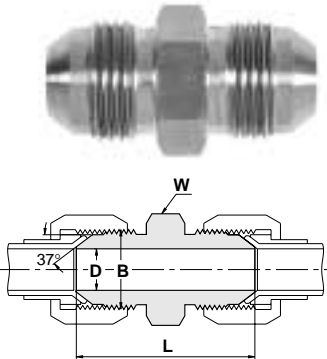
Metric sleeves are used with standard nuts & bodies

741HFSS Nut For 3 Piece Tube Assembly S.A.E. 070110


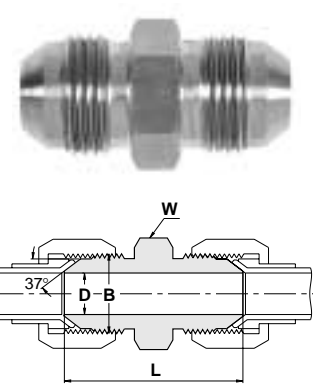
Tube O.D.		B UNF	W Inch	L	
Inch	mm			Inch	mm
1/8	-	5/16 -24	3/8	0.54	13.7
3/16	-	3/8 -24	7/16	0.60	15.2
1/4	6	7/16 -20	9/16	0.61	15.5
5/16	8	1/2 -20	5/8	0.67	17.0
3/8	10	9/16 -18	11/16	0.72	18.3
1/2	12	3/4 -16	7/8	0.84	21.3
5/8	16	7/8 -14	1	0.97	24.6
3/4	18	1-1/16 -12	1-1/4	1.02	25.9
7/8	20	1-3/16 -12	1-3/8	1.08	27.4
1	25	1-5/16 -12	1-1/2	1.12	28.4
1-1/4	32	1-5/8 -12	2	1.22	31.0
1-1/2	38	1-7/8 -12	2 1/4	1.41	35.8
2		1-1/2 -12	2 7/8	1.74	44.2

741HFLSS Reducing Adaptor, S.A.E. 070123


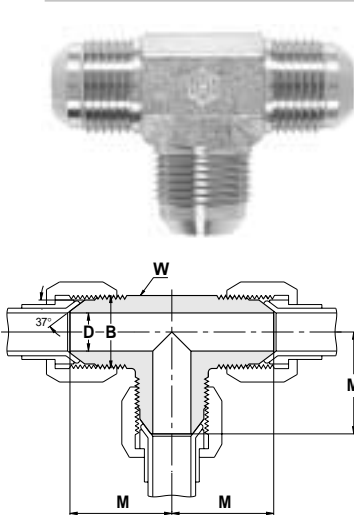
Tube O.D.		B	L	
inch	mm	UNF	Inch	mm
3/8 to 1/4	3/8 to 6	7/16 - 20	0.97	24.6
1/2 to 1/4	1/2 to 6	7/16 - 20	1.00	25.4
1/2 to 3/8	1/2 to 10	9/16 - 18	1.00	25.4
5/8 to 1/4	5/8 to 6	7/16 - 20	1.03	26.2
5/8 to 3/8	5/8 to 10	9/16 - 18	1.03	26.2
5/8 to 1/2	5/8 to 12	3/4 - 16	1.44	36.5
3/4 to 1/4	3/4 to 6	7/16 - 20	1.09	27.7
3/4 to 3/8	3/4 to 10	9/16 - 18	1.09	27.7
3/4 to 1/2	3/4 to 12	3/4 - 16	1.19	30.2
3/4 to 5/8	3/4 to 16	7/8 - 14	1.66	42.1
7/8 to 3/8	7/8 to 10	9/16 - 18	1.13	28.7
7/8 to 5/8	7/8 to 16	7/8 - 14	1.33	33.7
7/8 to 3/4	7/8 to 18	1-1/16 - 12	1.84	46.7
1 to 3/4	1 to 18	1-1/16 - 12	1.47	37.3
1 to 7/8	1 to 20	1-3/16 - 12	1.91	48.5
1-1/4 to 3/4	1-1/4 to 18	1-1/16 - 12	1.53	38.8
1-1/4 to 1	1-1/4 to 25	1-5/16 - 12	1.59	40.3
1-1/2 to 11/4	1-1/2 to 32	1-5/8 - 12	1.69	42.9

742HFSS Union S.A.E. 070101


Tube O.D.		B	D		W	L	
inch	mm	UNF	inch	mm	inch	inch	mm
1/8	-	5/16 - 24	0.062	1.6	7/16	1.17	29.7
3/16	-	3/8 - 24	0.125	3.2	7/16	1.23	31.2
1/4	6	7/16 - 20	0.172	4.4	1/2	1.37	34.8
5/16	8	1/2 - 20	0.234	6.0	9/16	1.37	34.8
3/8	10	9/16 - 18	0.297	7.5	5/8	1.41	35.8
1/2	12	3/4 - 16	0.391	9.9	13/16	1.62	41.1
5/8	16	7/8 - 14	0.484	12.3	15/16	1.88	47.8
3/4	18	1-1/16 - 12	0.609	15.5	1-1/8	2.16	54.9
7/8	20	1-3/16 - 12	0.719	18.3	1-1/4	2.21	56.1
1	25	1-5/16 - 12	0.844	21.5	1-3/8	2.25	57.2
1-1/4	32	1-5/8 - 12	1.078	27.5	1-11/16	2.43	61.7
1-1/2	38	1-7/8 - 12	1.312	33.0	2	2.75	69.8
2		2-1/2 - 12	1.781	45.0	2-5/8	3.04	86.4

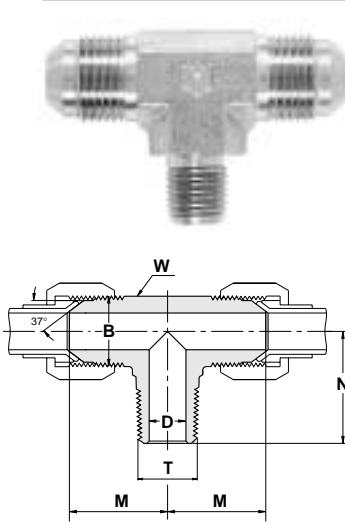
7 4 2 HFLSS Large Hex Union, S.A.E. 070119


Tube O.D.		B	D		W	L	
inch	mm	UNF	inch	mm	inch	inch	mm
1/8	-	5/16 - 24	0.062	1.6	9/16	1.17	29.7
3/16	-	3/8 - 24	0.125	3.2	5/8	1.23	31.2
1/4	6	7/16 - 20	0.172	4.4	11/16	1.37	34.8
5/16	8	1/2 - 20	0.234	6.0	3/4	1.37	34.8
3/8	10	9/16 - 18	0.297	7.5	13/16	1.41	35.8
1/2	12	3/4 - 16	0.391	9.9	1	1.62	41.1
5/8	16	7/8 - 14	0.484	12.3	1-1/8	1.88	47.8
3/4	18	1-1/16 - 12	0.609	15.5	1-3/8	2.16	54.9
7/8	20	1-3/16 - 12	0.719	18.3	1-1/2	2.21	56.1
1	25	1-5/16 - 12	0.844	21.5	1-5/8	2.25	57.2
1-1/4	32	1-5/8 - 12	1.078	27.5	1-7/8	2.43	61.7
1-1/2	38	1-7/8 - 12	1.312	33.0	2-1/8	2.75	69.8
2		2-1/2 - 12	1.781	45.0	2-3/4	3.04	86.4

7 4 4 HFSS Union Tee, S.A.E. 070401


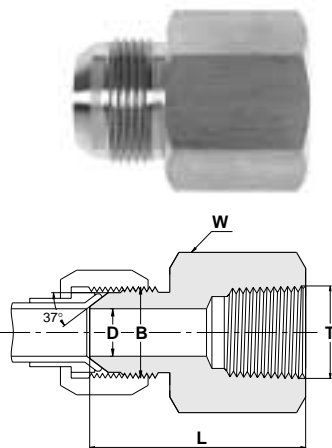
Tube O.D.		B	D		W	M	
inch	mm	UNF	inch	mm	inch	inch	mm
1/8	-	5/16 - 24	0.062	1.6	7/16	0.77	19.6
3/16	-	3/8 - 24	0.125	3.2	1/2	0.83	21.1
1/4	6	7/16 - 20	0.172	4.4	1/2	0.89	22.6
5/16	8	1/2 - 20	0.234	6.0	5/8	0.95	24.1
3/8	10	9/16 - 18	0.297	7.5	5/8	1.06	26.9
1/2	12	3/4 - 16	0.391	9.9	15/16	1.25	31.8
5/8	16	7/8 - 14	0.484	12.3	15/16	1.45	36.8
3/4	18	1-1/16 - 12	0.609	15.5	1 3/8	1.66	42.2
7/8	20	1-3/16 - 12	0.719	18.3	1 3/8	1.80	45.7
1	25	1-5/16 - 12	0.844	21.5	1 3/8	1.81	46.0
1-1/4	32	1-5/8 - 12	1.078	27.5	1-11/16	2.06	52.3
*1-1/2	38	1-7/8 - 12	1.312	33.0	*2	2.33	59.2
*2		2-1/2 - 12	1.781	45.0	*2-5/8	3.06	77.7

* Not from forging

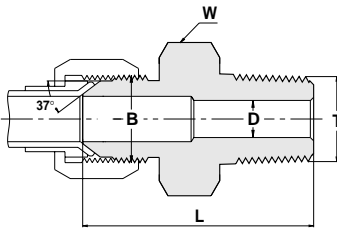
745HFSS Male Branch Tee, S.A.E. 070425


Tube O.D.		B	T	D		W	M		N	
inch	mm	UNF	NPT	inch	mm	inch	inch	mm	inch	mm
1/8	-	5/16 - 24	1/8 - 27	0.062	1.6	7/16	0.77	19.6	0.72	18.3
3/16	-	3/8 - 24	1/8 - 27	0.125	3.2	1/2	0.83	21.1	0.72	18.3
1/4	6	7/16 - 20	1/8 - 27	0.172	4.4	1/2	0.89	22.6	0.78	19.8
1/4	6	7/16 - 20	1/4 - 18	0.172	4.4	5/8	1.06	26.9	1.09	27.7
5/16	8	1/2 - 20	1/8 - 27	0.190	4.8	5/8	0.95	24.1	0.78	19.8
5/16	8	1/2 - 20	1/4 - 18	0.234	6.0	5/8	1.06	26.9	1.09	27.7
3/8	10	9/16 - 18	1/8 - 27	0.190	4.8	5/8	1.06	26.9	0.9	22.8
3/8	10	9/16 - 18	1/4 - 18	0.280	7.1	5/8	1.06	26.9	1.09	27.7
3/8	10	9/16 - 18	3/8 - 18	0.297	7.5	13/16	1.14	29.0	1.22	31.0
3/8	10	9/16 - 18	1/2 - 14	0.297	7.5	15/16	1.23	31.2	1.47	37.3
1/2	12	3/4 - 16	1/4 - 18	0.280	7.1	15/16	1.25	31.8	1.22	31.0
1/2	12	3/4 - 16	3/8 - 18	0.380	9.5	15/16	1.25	31.8	1.22	31.0
1/2	12	3/4 - 16	1/2 - 14	0.391	9.9	15/16	1.33	33.7	1.47	37.3
1/2	12	3/4 - 16	3/4 - 14	0.391	9.9	1 1/8	1.42	36.0	1.59	40.4
5/8	16	7/8 - 14	3/8 - 18	0.380	9.5	15/16	1.45	36.8	1.30	33.0
5/8	16	7/8 - 14	1/2 - 14	0.470	11.9	15/16	1.45	36.8	1.47	37.3
5/8	16	7/8 - 14	3/4 - 14	0.484	12.3	1 1/8	1.53	38.9	1.59	40.4
3/4	18	1-1/16 - 12	1/2 - 14	0.470	11.9	1 1/8	1.66	41.0	1.59	40.4
3/4	18	1-1/16 - 12	3/4 - 14	0.609	15.5	1 1/8	1.66	41.0	1.59	40.4
7/8	20	1-3/16 - 12	3/4 - 14	0.719	18.3	1 3/8	1.73	43.9	1.69	42.9
1	25	1-5/16 - 12	3/4 - 14	0.719	18.3	1 3/8	1.81	46.0	1.78	45.2
1	25	1-5/16 - 12	1-11.5	0.844	21.5	1 3/8	1.81	46.0	1.97	50.0
1-1/4	32	1-5/8 - 12	1-11.5	0.844	21.5	1-11/16	2.06	52.3	2.35	59.6
1-1/4	32	1-5/8 - 12	1-1/4 -11.5	1.078	27.5	1-11/16	2.06	52.3	2.38	60.5
*1-1/2	38	17/8 - 12	1-1/2 -11.5	1.312	33.0	*2	2.33	59.2	2.64	67.1
*2		17/8 - 12	2 -11.5	1.781	45.0	*2 5/8	3.06	77.7	3.0	76.2

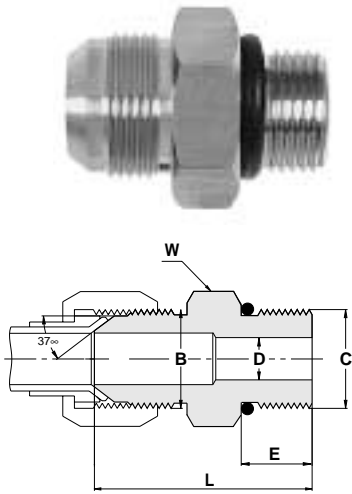
* Not from forging

746HFSS Female Connector, S.A.E. 070103


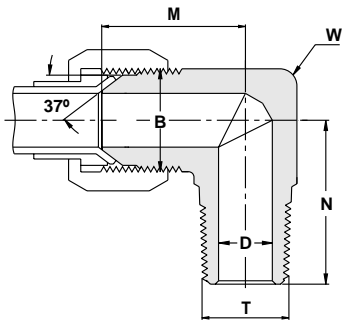
Tube O.D.		B	T	D		W	M	
inch	mm	UNF	NPT	inch	mm	inch	inch	mm
1/8	-	5/16 - 24	1/8 - 27	0.062	1.6	9/16	1.12	28.4
3/16	-	3/8 - 24	1/8 - 27	0.125	3.2	9/16	1.13	28.7
1/4	6	7/16 - 20	1/8 - 27	0.172	4.4	9/16	1.19	30.2
1/4	6	7/16 - 20	1/4 - 18	0.172	4.4	3/4	1.39	35.3
5/16	8	1/2 - 20	1/8 - 27	0.234	6.0	9/16	1.17	29.7
5/16	8	1/2 - 20	1/4 - 18	0.234	6.0	3/4	1.39	35.3
3/8	10	9/16 - 18	1/4 - 18	0.297	7.5	3/4	1.40	35.6
3/8	10	9/16 - 18	3/8 - 18	0.297	7.5	7/8	1.46	37.1
1/2	12	3/4 - 16	3/8 - 18	0.391	9.9	7/8	1.56	39.6
1/2	12	3/4 - 16	1/2 - 14	0.391	9.9	1-1/8	1.79	45.6
5/8	16	7/8 - 14	1/2 - 14	0.484	12.3	1-1/8	1.89	48.0
3/4	18	1-1/16 - 12	1/2 - 14	0.609	15.5	1-1/8	2.05	52.1
3/4	18	1-1/16 - 12	3/4 - 14	0.609	15.5	1-3/8	2.06	52.3
7/8	20	1-3/16 - 12	3/4 - 14	0.719	18.3	1-3/8	2.06	52.3
1	25	1-5/16 - 12	1 - 11.5	0.844	21.5	1-5/8	2.35	59.7
1-1/4	32	1-5/8 - 12	1-1/4 -11.5	1.078	27.5	2	2.49	63.2
1-1/2	38	1-7/8 - 12	1-1/2 -11.5	1.312	33.0	2-3/8	2.62	66.5
2		2-1/2 - 12	2 -11.5	1.781	45.0	2-7/8	2.97	75.4


748HFSS Male Connector S.A.E. 070102

Tube O.D.		B	T	D		W	L	
inch	mm	UNF	NPT	inch	mm	inch	inch	mm
1/8	-	5/16 - 24	1/8 - 27	0.062	1.6	7/16	1.11	28.2
3/16	-	3/8 - 24	1/8 - 27	0.125	3.2	7/16	1.14	29.0
1/4	6	7/16 - 20	1/8 - 27	0.172	4.4	1/2	1.22	31.0
1/4	6	7/16 - 20	1/4 - 18	0.172	4.4	9/16	1.42	36.0
1/4	6	7/16 - 20	1/2 - 14	0.172	4.4	7/8	1.68	42.7
5/16	8	1/2 - 20	1/8 - 27	0.190	4.8	9/16	1.22	31.0
5/16	8	1/2 - 20	1/4 - 18	0.234	6.0	9/16	1.42	36.1
3/8	10	9/16 - 18	1/8 - 27	0.190	4.8	5/8	1.25	31.8
3/8	10	9/16 - 18	1/4 - 18	0.280	7.1	5/8	1.43	36.3
3/8	10	9/16 - 18	3/8 - 18	0.297	7.5	3/4	1.43	36.3
3/8	10	9/16 - 18	1/2 - 14	0.297	7.5	7/8	1.69	42.5
1/2	12	3/4 - 16	1/4 - 18	0.280	7.1	13/16	1.53	38.9
1/2	12	3/4 - 16	3/8 - 18	0.380	9.5	13/16	1.53	38.9
1/2	12	3/4 - 16	1/2 - 14	0.391	9.9	7/8	1.79	45.4
1/2	12	3/4 - 16	3/4 - 14	0.391	9.9	1-1/8	1.85	47.0
5/8	16	7/8 - 14	3/8 - 18	0.380	9.5	15/16	1.70	43.1
5/8	16	7/8 - 14	1/2 - 14	0.484	11.9	15/16	1.89	48.0
5/8	16	7/8 - 14	3/4 - 14	0.470	12.3	1-1/8	1.95	49.5
3/4	18	1-1/16 - 12	3/4 - 14	0.609	15.5	1-1/8	2.06	52.3
3/4	18	1-1/16 - 12	1 - 11.5	0.609	15.5	1-3/8	2.25	57.1
7/8	20	1-3/16 - 12	3/4 - 14	0.719	18.3	1-1/4	2.09	53.1
1	25	1-5/16 - 12	3/4 - 14	0.719	18.3	1-3/8	2.11	53.5
1	25	1-5/16 - 12	1 - 11.5	0.844	21.5	1-3/8	2.30	58.4
1-1/4	32	1-5/8 - 12	1 - 11.5	0.844	21.5	1-11/16	2.42	61.5
1-1/4	32	1-5/8 - 12	1-1/4 - 11.5	1.078	27.5	1-11/16	2.45	62.2
1-1/2	38	1-7/8 - 12	1-1/4 - 11.5	1.312	33.0	2	2.68	68.1
1-1/2	38	1-7/8 - 12	1-1/2 - 11.5	1.312	33.0	2	2.68	68.1
2		2-1/2 - 12	2 - 11.5	1.781	45.0	2-5/8	3.11	79.0

748HOBSS Male Connector SAE Straight Thread Boss Connects Flared Tube ends to straight thread boss S.A.E. 070120


Tube O.D.		B	C	D		W	E		L		O-Ring STD. Dash NO.
inch	mm	UN	UN	inch	mm	inch	inch	mm	inch	mm	
1/8	-	5/16 - 24	5/16 - 24	0.062	1.6	7/16	0.3	7.5	1.06	26.9	-902
3/16	-	3/8 - 24	3/8 - 24	0.125	3.2	1/2	0.3	7.5	1.10	27.9	-903
1/4	6	7/16 - 20	7/16 - 20	0.172	4.4	9/16	0.36	9.1	1.23	31.2	-904
1/4	6	7/16 - 20	1/2 - 20	0.172	4.4	5/8	0.36	9.1	1.23	31.2	-905
1/4	6	7/16 - 20	9/16 - 18	0.172	4.4	11/16	0.39	9.9	1.30	33.0	-906
1/4	6	7/16 - 20	3/4 - 16	0.172	4.4	7/8	0.44	11.1	1.37	34.8	-908
5/16	8	1/2 - 20	1/2 - 20	0.234	6.0	5/8	0.36	9.1	1.23	31.2	-905
3/8	10	9/16 - 18	9/16 - 18	0.280	7.5	11/16	0.39	9.9	1.30	33.0	-906
3/8	10	9/16 - 18	3/4 - 16	0.297	7.5	7/8	0.44	11.1	1.38	35.1	-908
3/8	10	9/16 - 18	7/8 - 14	0.297	7.5	1	0.50	12.7	1.50	38.1	-910
1/2	12	3/4 - 16	3/4 - 16	0.391	9.9	7/8	0.44	11.1	1.48	37.6	-908
1/2	12	3/4 - 16	9/16 - 18	0.280	9.9	13/16	0.39	9.9	1.44	36.6	-906
1/2	12	3/4 - 16	7/8 - 14	0.391	9.9	1	0.50	12.7	1.60	40.6	-910
1/2	12	3/4 - 16	1-1/16 - 12	0.391	9.9	1-1/4	0.59	15.1	1.76	44.7	-912
5/8	16	7/8 - 14	7/8 - 14	0.484	12.3	1	0.50	12.7	1.70	43.2	-910
5/8	16	7/8 - 14	3/4 - 16	0.484	12.3	15/16	0.44	11.1	1.60	40.6	-908
5/8	16	7/8 - 14	1-1/16 - 12	0.484	12.3	1-1/4	0.59	15.1	1.86	47.2	-912
3/4	18	1-1/16 - 12	1-1/16 - 12	0.609	15.5	1-1/4	0.59	15.1	1.97	50.0	-912
3/4	18	1-1/16 - 12	3/4 - 16	0.420	10.7	1-1/8	0.44	11.1	1.78	45.2	-908
3/4	18	1-1/16 - 12	7/8 - 14	0.50	12.7	1-1/8	0.50	12.7	1.83	46.4	-910
3/4	18	1-1/16 - 12	1-5/16 - 12	0.609	15.5	1-1/2	0.59	15.1	2.00	50.8	-916
7/8	20	1-3/16 - 12	1-3/16 - 12	0.719	18.3	1-3/8	0.59	15.1	1.99	50.5	-914
7/8	20	1-3/16 - 12	1-5/16 - 12	0.719	18.3	1-1/2	0.59	15.1	2.02	51.3	-916
1	25	1-5/16 - 12	1-5/16 - 12	0.844	21.5	1-1/2	0.59	15.1	2.04	51.8	-916
1	25	1-5/16 - 12	1-1/16 - 12	0.650	16.7	1-3/8	0.59	15.1	2.01	51.1	-912
1	25	1-5/16 - 12	1-3/16 - 12	0.719	18.3	1-3/8	0.59	15.1	2.04	51.8	-914

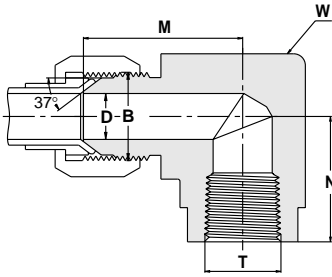


749HFSS Male Elbow S.A.E. 070202

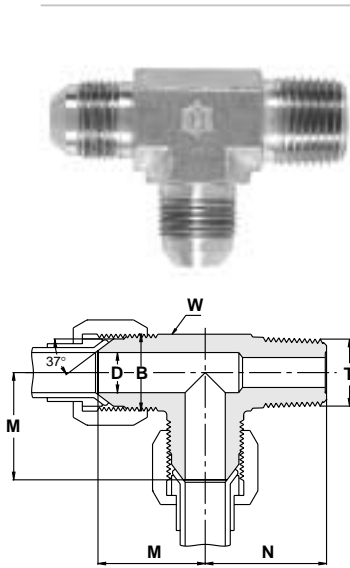
Tube O.D.		B	T	D		W	M		N	
inch	mm	UNF	NPT	inch	mm	inch	inch	mm	inch	mm
1/8	-	5/16 - 24	1/8 - 27	0.062	1.6	7/16	0.77	19.6	0.72	18.3
3/16	-	3/8 - 24	1/8 - 27	0.125	3.2	1/2	0.83	21.1	0.72	18.3
1/4	6	7/16 - 20	1/8 - 27	0.172	4.4	1/2	0.89	22.6	0.78	19.8
1/4	6	7/16 - 20	1/4 - 18	0.172	4.4	5/8	1.06	26.9	1.09	27.7
5/16	8	1/2 - 20	1/8 - 27	0.190	4.8	5/8	0.95	24.1	0.78	19.8
5/16	8	1/2 - 20	1/4 - 18	0.234	6.0	5/8	1.06	26.9	1.09	27.7
3/8	10	9/16 - 18	1/8 - 27	0.190	4.8	5/8	1.06	26.9	0.9	22.8
3/8	10	9/16 - 18	1/4 - 18	0.280	7.1	5/8	1.06	26.9	1.09	27.7
3/8	10	9/16 - 18	3/8 - 18	0.297	7.5	13/16	1.14	29.0	1.22	31.0
3/8	10	9/16 - 18	1/2 - 14	0.297	7.5	15/16	1.23	31.2	1.47	37.3
1/2	12	3/4 - 16	1/4 - 18	0.280	7.1	15/16	1.25	31.8	1.22	31.0
1/2	12	3/4 - 16	3/8 - 18	0.380	9.5	15/16	1.25	31.8	1.22	31.0
1/2	12	3/4 - 16	1/2 - 14	0.391	9.9	15/16	1.33	33.7	1.47	37.3
1/2	12	3/4 - 16	3/4 - 14	0.391	9.9	1-1/8	1.42	36.0	1.59	40.4
5/8	16	7/8 - 14	3/8 - 18	0.380	9.5	15/16	1.45	36.8	1.30	33.0
5/8	16	7/8 - 14	1/2 - 14	0.470	11.9	15/16	1.45	36.8	1.47	37.3
5/8	16	7/8 - 14	3/4 - 14	0.484	12.3	1-1/8	1.53	38.9	1.59	40.4
3/4	18	1-1/16 - 12	1/2 - 14	0.470	11.9	1-1/8	1.66	41.0	1.59	40.4
3/4	18	1-1/16 - 12	3/4 - 14	0.609	15.5	1-1/8	1.66	41.0	1.59	40.4
7/8	20	1-3/16 - 12	3/4 - 14	0.719	18.3	1-3/8	1.73	43.9	1.69	42.9
1	25	1-5/16 - 12	3/4 - 14	0.719	18.3	1-3/8	1.81	46.0	1.78	45.2
1	25	1-5/16 - 12	1-11.5	0.844	21.5	1-3/8	1.81	46.0	1.97	50.0
1-1/4	32	1-5/8 - 12	1-11.5	0.844	21.5	1-11/16	2.06	52.3	2.35	59.6
1-1/4	32	1-5/8 - 12	1-1/4 - 11.5	1.078	27.5	1-11/16	2.06	52.3	2.38	60.5
*1-1/2	38	1-7/8 - 12	1-1/2 - 11.5	1.312	33.0	2	2.33	59.2	2.64	67.1
*2		2-1/2 - 12	2 - 11.5	1.781	45.0	2 5/8	3.06	77.7	3.0	76.2

* Not from forging

750HFSS Female Elbow S.A.E. 070203

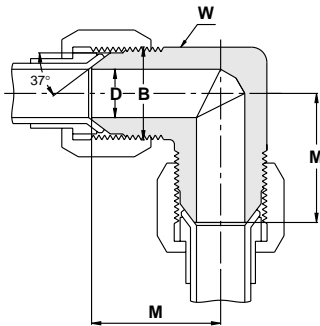


Tube O.D.		B	T	D		W	M		N	
inch	mm	UNF	NPT	inch	mm	inch	inch	mm	inch	mm
1/8	-	5/16 - 24	1/8 - 27	0.062	1.6	5/8	1	25.4	0.66	16.8
3/16	-	3/8 - 24	1/8 - 27	0.125	3.2	5/8	1.03	26.2	0.66	16.8
1/4	6	7/16 - 20	1/8 - 27	0.172	4.4	5/8	1.08	27.4	0.66	16.8
1/4	6	7/16 - 20	1/4 - 18	0.172	4.4	13/16	1.22	30.9	0.88	22.4
5/16	8	1/2 - 20	1/8 - 27	0.234	6.0	5/8	1.08	27.4	0.66	16.8
5/16	8	1/2 - 20	1/4 - 18	0.234	6.0	13/16	1.22	30.9	0.88	22.4
3/8	10	9/16 - 18	1/8 - 27	0.297	7.5	5/8	1.06	26.9	0.66	16.8
3/8	10	9/16 - 18	1/4 - 18	0.297	7.5	13/16	1.23	31.2	0.88	22.4
3/8	10	9/16 - 18	3/8 - 18	0.297	7.5	15/16	1.31	33.2	1.02	25.9
1/2	12	3/4 - 16	1/4 - 18	0.391	9.9	13/16	1.25	31.6	0.88	22.4
1/2	12	3/4 - 16	3/8 - 18	0.391	9.9	15/16	1.42	36.1	1.02	25.9
1/2	12	3/4 - 16	1/2 - 14	0.391	9.9	1-1/8	1.42	36.1	1.23	31.2
5/8	16	7/8 - 14	1/2 - 14	0.484	12.3	1-1/8	1.64	41.5	1.23	31.2
3/4	18	1-1/16 - 12	1/2 - 14	0.609	15.5	1-3/8	1.66	42.1	1.23	31.2
3/4	18	1-1/16 - 12	3/4 - 14	0.609	15.5	1-3/8	1.89	48.0	1.36	34.5
7/8	20	1-3/16 - 12	3/4 - 14	0.719	18.3	1-3/8	1.86	47.2	1.42	36.1
1	25	1-5/16 - 12	1 - 11.5	0.844	21.5	1-5/8	2.17	55.1	1.62	41.1
1-1/4	32	1-5/8 - 12	1-1/4 - 11.5	1.078	27.5	2 1/8	2.33	59.2	1.70	43.2
1-1/2	38	1-7/8 - 12	1-1/2 - 11.5	1.312	33.0	2 3/8	2.89	73.4	2.08	52.8
2		2-1/2 - 12	2 - 11.5	1.781	45.0	2 7/8	3.30	83.8	2.39	60.7

751HFSS Male Run Tee S.A.E. 070424


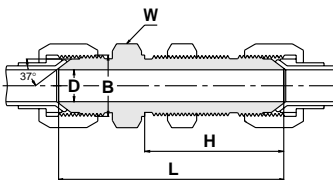
Tube O.D.		B	T	D		W	M		N	
inch	mm	UNF	NPT	inch	mm	inch	inch	mm	inch	mm
1/8	-	5/16 - 24	1/8 - 27	0.062	1.6	7/16	0.77	19.6	0.72	18.3
3/16	-	3/8 - 24	1/8 - 27	0.125	3.2	1/2	0.83	21.1	0.72	18.3
1/4	6	7/16 - 20	1/8 - 27	0.172	4.4	1/2	0.89	22.6	0.78	19.8
1/4	6	7/16 - 20	1/4 - 18	0.172	4.4	5/8	1.06	26.9	1.09	27.7
5/16	8	1/2 - 20	1/8 - 27	0.190	4.8	5/8	0.95	24.1	0.78	19.8
5/16	8	1/2 - 20	1/4 - 18	0.234	6.0	5/8	1.06	26.9	1.09	27.7
3/8	10	9/16 - 18	1/8 - 27	0.190	4.8	5/8	1.06	26.9	0.9	22.8
3/8	10	9/16 - 18	1/4 - 18	0.280	7.1	5/8	1.06	26.9	1.09	27.7
3/8	10	9/16 - 18	3/8 - 18	0.297	7.5	13/16	1.14	29.0	1.22	31.0
3/8	10	9/16 - 18	1/2 - 14	0.297	7.5	15/16	1.23	31.2	1.47	37.3
1/2	12	3/4 - 16	1/4 - 18	0.280	7.1	15/16	1.25	31.8	1.22	31.0
1/2	12	3/4 - 16	3/8 - 18	0.380	9.5	15/16	1.25	31.8	1.22	31.0
1/2	12	3/4 - 16	1/2 - 14	0.391	9.9	15/16	1.33	33.7	1.47	37.3
1/2	12	3/4 - 16	3/4 - 14	0.391	9.9	1-1/8	1.42	36.0	1.59	40.4
5/8	16	7/8 - 14	3/8 - 18	0.380	9.5	15/16	1.45	36.8	1.30	33.0
5/8	16	7/8 - 14	1/2 - 14	0.470	11.9	15/16	1.45	36.8	1.47	37.3
5/8	16	7/8 - 14	3/4 - 14	0.484	12.3	1-1/8	1.53	38.9	1.59	40.4
3/4	18	1-1/16 - 12	1/2 - 14	0.470	11.9	1-1/8	1.66	41.0	1.59	40.4
3/4	18	1-1/16 - 12	3/4 - 14	0.609	15.5	1-1/8	1.66	41.0	1.59	40.4
7/8	20	1-3/16 - 12	3/4 - 14	0.719	18.3	1-3/8	1.73	43.9	1.69	42.9
1	25	1-5/16 - 12	3/4 - 14	0.719	18.3	1-3/8	1.81	46.0	1.78	45.2
1	25	1-5/16 - 12	1 - 11.5	0.844	21.5	1-3/8	1.81	46.0	1.97	50.0
1-1/4	32	1-5/8 - 12	1 - 11.5	0.844	21.5	1-11/16	2.06	52.3	2.35	59.6
1-1/4	32	1-5/8 - 12	1-1/4 - 11.5	1.078	27.5	1-11/16	2.06	52.3	2.38	60.5
*1-1/2	38	1-7/8 - 12	1-1/2 - 11.5	1.312	33.0	*2	2.33	59.2	2.64	67.1
*2		2-1/2 - 12	2 - 11.5	1.781	45.0	*2-5/8	3.06	77.7	3.0	76.2

* Not From Forging

755HFSS Union Elbow S.A.E. 070201


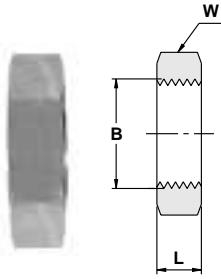
Tube O.D.		B	D		W	L	
Inch	mm	UNF	Inch	mm	Inch	Inch	mm
1/8	-	5/16 - 24	0.062	1.6	7/16	0.77	19.6
3/16	-	3/8 - 24	0.125	3.2	1/2	0.83	21.1
1/4	6	7/16 - 20	0.172	4.4	1/2	0.89	22.6
5/16	8	1/2 - 20	0.234	6.0	5/8	0.95	24.1
3/8	10	9/16 - 18	0.297	7.5	5/8	1.06	26.9
1/2	12	3/4 - 16	0.391	9.9	15/16	1.25	31.8
5/8	16	7/8 - 14	0.484	12.3	15/16	1.45	36.8
3/4	18	1-1/16 - 12	0.609	15.5	13/8	1.66	42.2
7/8	20	1-3/16 - 12	0.719	18.3	13/8	1.80	45.7
1	25	1-5/16 - 12	0.844	21.5	13/8	1.81	46.0
1-1/4	32	1-5/8 - 12	1.078	27.5	1-11/16	2.06	52.3
*1-1/2	38	1-7/8 - 12	1.312	33.0	*2	2.33	59.2
*2		2-1/2 - 12	1.781	45.0	*25/8	3.06	77.7

* Not From Forging

774HFLSS Bulkhead Union S.A.E. 070601


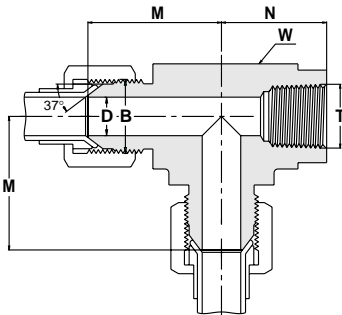
Tube O.D.		B	D		W	H	L		
Inch	mm	UNF	Inch	mm	Inch	Inch	mm	Inch	mm
3/16	-	3/8 - 24	0.125	3.2	5/8	1.11	28.2	1.90	48.3
1/4	6	7/16 - 20	0.172	4.4	11/16	1.20	30.5	2.07	52.6
5/16	8	1/2 - 20	0.234	6.0	3/4	1.20	30.5	2.07	52.6
3/8	10	9/16 - 18	0.297	7.5	13/16	1.28	32.5	2.18	55.4
1/2	12	3/4 - 16	0.391	9.9	1	1.44	36.6	2.44	62.0
5/8	16	7/8 - 14	0.484	12.3	11/8	1.58	40.1	2.74	69.6
3/4	18	1-1/16 - 12	0.609	15.5	13/8	1.75	44.4	3.09	78.5
7/8	20	1-3/16 - 12	0.719	18.3	11/2	1.75	44.4	3.12	79.2
1	25	1-5/16 - 12	0.844	21.5	15/8	1.75	44.4	3.14	79.8
1-1/4	32	1-5/8 - 12	1.078	27.5	17/8	1.80	45.7	3.31	84.1
1-1/2	38	1-7/8 - 12	1.312	33.0	21/8	1.81	46.0	3.52	89.4
2		2-1/2 - 12	1.781	45.0	23/4	2.09	53.1	4.20	106.7

774HFLN Bulkhead Locknut S.A.E. 070118



Tube O.D.		B	W	L	
inch	mm	UNF	inch	inch	mm
3/16	-	3/8 - 24	5/8	0.22	5.6
1/4	6	7/16 - 20	11/16	0.25	6.4
5/16	8	1/2 - 20	3/4	0.25	6.4
3/8	10	9/16 - 18	13/16	0.27	6.9
1/2	12	3/4 - 16	1	0.31	7.9
5/8	16	7/8 - 14	1-1/8	0.36	9.1
3/4	18	1-1/16 - 12	1-3/8	0.41	10.4
7/8	20	1-3/16 - 12	1-1/2	0.41	10.4
1	25	1-5/16 - 12	1-5/8	0.41	10.4
1-1/4	32	1-5/8 - 12	1-7/8	0.41	10.4
1-1/2	38	1-7/8 - 12	2-1/8	0.41	10.4
2		1-1/2 - 12	2-3/4	0.41	10.4

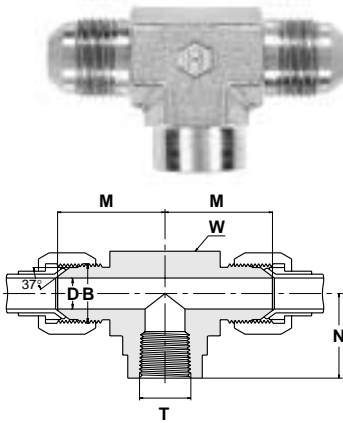
771HLFSS Female Run Tee S.A.E. 070426



Tube O.D.		B	T	D		W		M	N	
inch	mm	UNF	NPT	inch	mm	inch	inch	mm	inch	mm
1/8	-	5/16 - 24	1/8 - 27	0.062	1.6	5/8	1	25.4	0.66	16.8
3/16	-	3/8 - 24	1/8 - 27	0.125	3.2	5/8	1.03	26.2	0.66	16.8
1/4	6	7/16 - 20	1/8 - 27	0.172	4.4	5/8	1.08	27.4	0.66	16.8
1/4	6	7/16 - 20	1/4 - 18	0.172	4.4	13/16	1.22	30.9	0.88	22.4
5/16	8	1/2 - 20	1/8 - 27	0.234	6.0	5/8	1.08	27.4	0.66	16.8
5/16	8	1/2 - 20	1/4 - 18	0.234	6.0	13/16	1.22	30.9	0.88	22.4
3/8	10	9/16 - 18	1/8 - 27	0.297	7.5	5/8	1.06	26.9	0.66	16.8
3/8	10	9/16 - 18	1/4 - 18	0.297	7.5	13/16	1.23	31.2	0.88	22.4
3/8	10	9/16 - 18	3/8 - 18	0.297	7.5	15/16	1.31	33.2	1.02	25.9
1/2	12	3/4 - 16	1/4 - 18	0.391	9.9	13/16	1.25	31.6	0.88	22.4
1/2	12	3/4 - 16	3/8 - 18	0.391	9.9	15/16	1.42	36.1	1.02	25.9
1/2	12	3/4 - 16	1/2 - 14	0.391	9.9	11/8	1.42	36.1	1.23	31.2
5/8	16	7/8 - 14	1/2 - 14	0.484	12.3	11/8	1.64	41.5	1.23	31.2
3/4	18	1-1/16 - 12	1/2 - 14	0.609	15.5	13/8	1.66	42.1	1.23	31.2
3/4	18	1-1/16 - 12	3/4 - 14	0.609	15.5	13/8	1.89	48.0	1.36	34.5
7/8	20	1-3/16 - 12	3/4 - 14	0.719	18.3	13/8	1.86	47.2	1.42	36.1
*1	25	1-5/16 - 12	1 - 11.5	0.844	21.5	*1 5/8	2.17	55.1	1.62	41.1
*1-1/4	32	1-5/8 - 12	1 1/4 - 11.5	1.078	27.5	*2 1/8	2.33	59.2	1.70	43.2
*1-1/2	38	1-7/8 - 12	1 1/2 - 11.5	1.312	33.0	*2 3/8	2.89	73.4	2.08	52.8
*2		2-1/2 - 12	2 - 11.5	1.781	45.0	*2 7/8	3.30	83.8	2.39	60.7

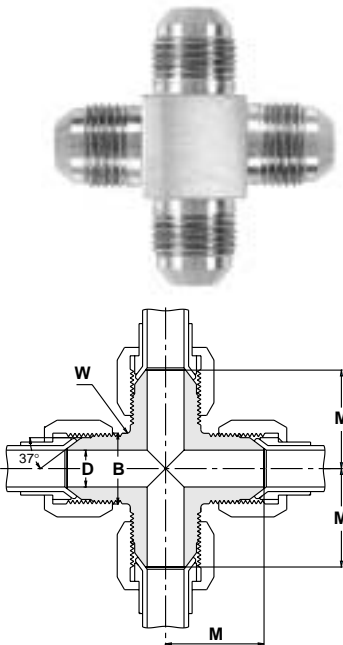
* Not from forging

772HFLSS Female Branch Tee S.A.E. 070427



Tube O.D.		B	T	D		W	M		N	
inch	mm	UNF	NPT	inch	mm	inch	Inch	mm	Inch	mm
1/8	-	5/16 - 24	1/8 - 27	0.062	1.6	5/8	1	25.4	0.66	16.8
3/16	-	3/8 - 24	1/8 - 27	0.125	3.2	5/8	1.03	26.2	0.66	16.8
1/4	6	7/16 - 20	1/8 - 27	0.172	4.4	5/8	1.08	27.4	0.66	16.8
1/4	6	7/16 - 20	1/4 - 18	0.172	4.4	13/16	1.22	30.9	0.88	22.4
5/16	8	1/2 - 20	1/8 - 27	0.234	6.0	5/8	1.08	27.4	0.66	16.8
5/16	8	1/2 - 20	1/4 - 18	0.234	6.0	13/16	1.22	30.9	0.88	22.4
3/8	10	9/16 - 18	1/8 - 27	0.297	7.5	5/8	1.06	26.9	0.66	16.8
3/8	10	9/16 - 18	1/4 - 18	0.297	7.5	13/16	1.23	31.2	0.88	22.4
3/8	10	9/16 - 18	3/8 - 18	0.297	7.5	15/16	1.31	33.2	1.02	25.9
1/2	12	3/4 - 16	1/4 - 18	0.391	9.9	13/16	1.25	31.6	0.88	22.4
1/2	12	3/4 - 16	3/8 - 18	0.391	9.9	15/16	1.42	36.1	1.02	25.9
1/2	12	3/4 - 16	1/2 - 14	0.391	9.9	1-1/8	1.42	36.1	1.23	31.2
5/8	16	7/8 - 14	1/2 - 14	0.484	12.3	1-1/8	1.64	41.5	1.23	31.2
3/4	18	1-1/16 - 12	1/2 - 14	0.609	15.5	1-3/8	1.66	42.1	1.23	31.2
3/4	18	1-1/16 - 12	3/4 - 14	0.609	15.5	1-3/8	1.89	48.0	1.36	34.5
7/8	20	1-3/16 - 12	3/4 - 14	0.719	18.3	1-3/8	1.86	47.2	1.42	36.1
*1	25	1-5/16 - 12	1 - 11.5	0.844	21.5	*1-5/8	2.17	55.1	1.62	41.1
*1-1/4	32	1-5/8 - 12	1-1/4 - 11.5	1.078	27.5	*2-1/8	2.33	59.2	1.70	43.2
*1-1/2	38	1-7/8 - 12	1-1/2 - 11.5	1.312	33.0	*2-3/8	2.89	73.4	2.08	52.8
*2		2-1/2 - 12	2 - 11.5	1.781	45.0	*2-7/8	3.30	83.8	2.39	60.7

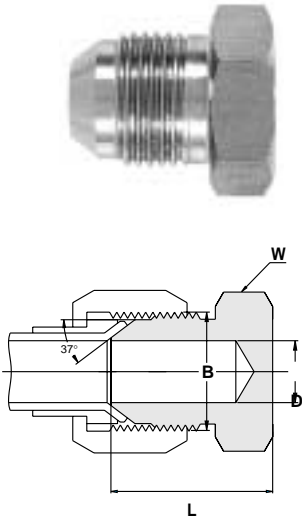
7102HFLSS Cross S.A.E. 070501



Tube O.D.		B	D		W	L	
Inch	mm	UNF	Inch	mm	Inch	Inch	mm
*1/8	-	5/16 - 24	0.062	1.6	*7/16	0.77	19.6
*3/16	-	3/8 - 24	0.125	3.2	*1/2	0.83	21.1
*1/4	6	7/16 - 20	0.172	4.4	*1/2	0.89	22.6
*5/16	8	1/2 - 20	0.234	6.0	*5/8	0.95	24.1
*3/8	10	9/16 - 18	0.297	7.5	*5/8	1.06	26.9
*1/2	12	3/4 - 16	0.391	9.9	*15/16	1.25	31.8
*5/8	16	7/8 - 14	0.484	12.3	*15/16	1.45	36.8
*3/4	18	1-1/16 - 12	0.609	15.5	*1-1/8	1.66	42.2
*7/8	20	1-3/16 - 12	0.719	18.3	*1-3/8	1.80	45.7
*1	25	1-5/16 - 12	0.844	21.5	*1-3/8	1.81	46.0
*1-1/4	32	1-5/8 - 12	1.078	27.5	*1-11/16	2.06	51.0
*1-1/2	38	1-7/8 - 12	1.312	33.0	*2	2.33	59.2
*2		2-1/2 - 12	1.781	45.0	*2-5/8	3.06	77.7

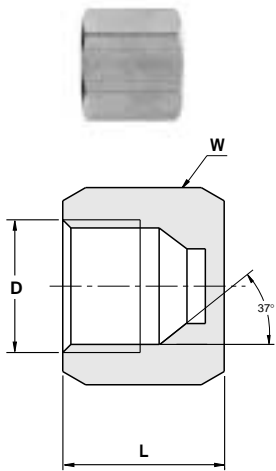
* Not from forging

7639HFSS Tube Cap S.A.E. 070109



Tube O.D.		B	D		W	L	
inch	mm	UNF	Inch	mm	inch	inch	mm
1/8	-	5/16 - 24	0.062	1.6	7/16	0.70	17.8
3/16	-	3/8 - 24	0.125	3.2	7/16	0.73	18.5
1/4	6	7/16 - 20	0.172	4.4	1/2	0.80	20.3
5/16	8	1/2 - 20	0.234	6.0	9/16	0.80	20.3
3/8	10	9/16 - 18	0.297	7.5	5/8	0.84	21.3
1/2	12	3/4 - 16	0.391	9.9	13/16	0.94	23.9
5/8	16	7/8 - 14	0.484	12.3	15/16	1.10	27.9
3/4	18	1 1/16 - 12	0.609	15.5	11/8	1.28	32.5
7/8	20	1 3/16 - 12	0.719	18.3	11/4	1.31	33.3
1	25	1 5/16 - 12	0.844	21.5	13/8	1.33	33.8
1 1/4	32	1 5/8 - 12	1.078	27.5	1 11/16	1.45	36.8
1 1/2	38	1 7/8 - 12	1.312	33.0	2	1.65	41.9
2		2 1/2 - 12	1.781	45.0	25/8	2.05	52.1

7640HFSS Plug S.A.E. 070112



Tube O.D.		B	W	L	
inch	mm	UNF	inch	inch	mm
1/8	-	5/16 - 24	3/8	0.550	12.7
3/16	-	3/8 - 24	7/16	0.562	14.3
1/4	6	7/16 - 20	9/16	0.594	15.1
5/16	8	1/2 - 20	5/8	0.609	15.5
3/8	10	9/16 - 18	11/16	0.625	15.9
1/2	12	3/4 - 16	7/8	0.750	19.0
5/8	16	7/8 - 14	1	0.844	21.4
3/4	18	1-1/16 - 12	11/4	0.906	23.0
7/8	20	1-3/16 - 12	13/8	0.969	24.6
1	25	1-5/16 - 12	11/2	1.016	25.8
1-1/4	32	1-5/8 - 12	2	1.062	27.0
1-1/2	38	1-7/8 - 12	21/4	1.188	30.2
2		1-1/2 - 12	27/8	1.438	36.5



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- Materials: All metal parts are 316 Stainless steel, O-Ring - Viton®.
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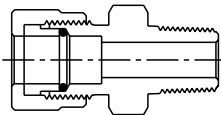


How to Order

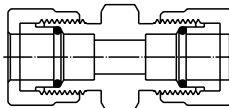
768	UH	SS	1/4	X	1/8
Fitting Type	Series Designator	Material Designator	Tube O.D		NPT
		SS=316SS B=Brass			

- * Available bored through. Add "R" to the cat. no.
- * Parts can be assembled and packed in a cleanroom class 100 if specified.
- * Only items priced in HAM-LET's up-to-date price-list are standard.
- * Price and delivery of non-stock items furnished on request.

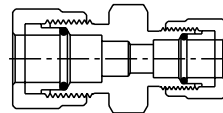
768 UH
Male Connector



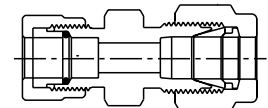
762 UH
Union



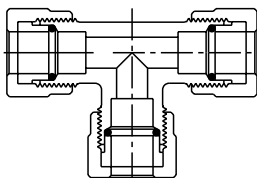
763 UH
Reducing Union



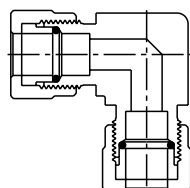
763 LUH
Let-Lok to UH Line



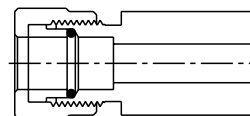
764 UH
Union Tee



765 UH
Union Elbow



767 UH
UH Line to Tube Adapter





HTC[®]

HI TECH COMPONENTS



ULTRA HIGH PURITY CONNECTORS
ORBITAL WELD AND METAL GASKET FACE SEAL FITTINGS

TECHNICAL INFORMATION

HAM-LET®/HTC® specializes in the design and manufacture of high quality, specially manufactured valves and fittings for High Purity and Ultra High Purity applications. HTC's expert staff of engineers and technicians have worked together to develop a complete line that reflects the company's deep understanding of the critical requirements of the semiconductor, biotech, and pharmaceutical industries.

HAM-LET®/HTC® is a leader in the manufacture of fittings and valves for clean industries and has consistently spearheaded significant new developments in this field. For example, the company has set new standards in the production of Ultra Pure fittings by incorporating the use of 316L Vim/Var as the standard material for the manufacture of fittings. HTC has also broken new ground in surface finishing techniques by implementing improved electro-polishing processes.

PLATING:

Female threads are silver plated to reduce the risk of galling while improving the remark ability of the fitting. This high quality plating also reduces the torque required for fitting assembly.

Lubrication: Female nuts and caps without a dry lubricant are available as an option.

Reference Spec: Meeting and exceeding - Mil Spec: QQ-S-365.

Note: Do not apply any type of cleaning acids and/or electropolishing solutions to any female threads. These solutions damage the silver plating and invalidate any expressed or implied warranty.

WELDING:

Welding options: - butt weld
- shoulder weld
- socket weld

Reference Specs: All welded products are manufactured and welded according to SEMI F3-94.

TESTING:

Ham-Let follows the relevant ASTM, ANSI, ASME, ISO, SEMI & SEMASPEC standards for testing and qualifying both processes and results.

JAPANESE STANDARDS:

Ham-Let, upon request, manufactures the HTC product line to meet the various Japanese standards:

- Low Manganese Material Specifications (JIS).
- Wall thickness.
- Hardness.

HTC® Fittings Temperature Rating

Products	Material	F	C
HTC® Fittings	316L	1000	538
	316LV	1000	538
HTC® Gaskets	316SS	1000	538
	Nickel	1000	538
HTC® Buttweld	316L	1000	538
	316LV	1000	538

HELIUM LEAK:

All Ham-Let Face Seal products are tested and qualified to a helium leak rate of less than 3×10^{-10} std cm³/sec. **Reference Spec:** SEMI F1.

SURFACE FINISH:

Reference Spec: ANSI B46.1 and ISO4288

SURFACE ANALYSIS:

SEM/EDX analysis is used to monitor surface defects per ASTM F1372 and ASTM F1375.

MOISTURE ANALYSIS:

Based on ASTM F1397

PARTICLE CONTRIBUTION

TEST:

Based on Semaspec 90120390 B.

SURFACE CHEMISTRY:

All UHP products are Electropolished with a proprietary process for achieving and exceeding the Sematec Standards of surface cleanliness and anticorrosion requirements. Parameters are measured by SEM, AUGER, ESCA. **Reference Spec:** SEMI F19-95; E49.9-0298; SEMASPEC 91060573A-STD.

CLEANING SPECIFICATIONS:

According to # H9800.

Reference Spec: SEMI E49.2-0298.

MATERIAL TRACEABILITY:

All HTC components are Heat Coded for full traceability.

ASSEMBLY:

According to SEMI E49.6-95

ACCESSORIES:

Grip Kit, Plastic Bead Protector, Metal Bead Protector.

PACKAGING:

Each "E" finished component is double bagged to insure component cleanliness and to protect it from environmental contamination. The inner bag is Nylon 6 and vacuum sealed. The outer bag is polyethylene.

Reference Spec: SEMI E49.1

INTERNATIONAL CERTIFICATIONS:

ISO 9000, Certified by A.S.M.E. & S.I.I.

HTC® Fittings Pressure Rating

Products	Material	Size	Wall Thickness	Pressure Rating	
				Psig	Bar
HTC Fittings	316L Or 316LV	1/4	0.035	5906	407
		3/8	0.035	3788	261
		1/2	0.049	3975	274
		3/4*	0.065	3488	241
		1*	0.065	2569	177

* 3/4 & 1 inch sizes, not Standard. Manufactured per request

Pressure ratings are calculated in accordance with ANSI Code for Pressure Piping ANSI B-31, for stainless steel fittings. All working pressures are at 4:1 safety factor.

Glands

GL-W 4
Gland Long without
Shoulder



GL-S 4
Gland Long with
Shoulder



GM-W 4
Gland Male without
Shoulder



GS-W 5
Gland Short without
Shoulder



GS-S 5
Gland Short with
Shoulder



MGS-W 5
Mini Gland Short without
Shoulder



MGS-S 6
Mini Gland Short with
Shoulder



AG 6
Adapter Gland



MG-W 6
Male Gland Short Tube
without
Shoulder



GSW 6
Gland Socket Weld



**Mini
Buttweld**

ME 7
Mini Elbow



MER 7
Mini Elbow Reducer



ME 45° 7
Mini Elbow 45 Degrees



MEX 8
Mini Elbow Extended Le



MT 8
Mini Tee



MTR 8
Mini Tee Reducer



MC 9
Mini Cross



MTB 9
Mini Tri-EL



RU 9
Reducing Union



**Shaped
Unions**



EU 10
Elbow Union



TU 10
Tee Union



CU 10
Cross Union



EM 11
Male Elbow



**AW Shaped
Connectors**



EW-W 11
AW Elbow without
Shoulder



TW-W 11
AW Tee without
Shoulder



CW-W 12
AW Cross without
Shoulder



RW-W 12
AW Reducer without
Shoulder



UB-W 12
Union Buttweld without
Shoulder



UB-S 13
Union Buttweld with
Shoulder



UBL-S 13
Union Buttweld With Locator
and Shoulder



**Threaded Straight
Connectors**



UM 14
Union Male



CM 14
Connector Male



RUM 14
Reducing Union Male



BU 15
Bulkhead Union



SBU 15
Short Bulkhead Union



BCM 15
Bulkhead Connector Male



MP 19
Male Plug



NM 20
Male Nut



CMOB 16
Connector Male to O-Ring Seal



FC 16
Female Connector NPT



SNM 20
Short Nut Male



High Flow Connectors

HGL 23
High Flow Gland Long



HMT 23
High Flow Male to Tube



UGL 16
Let-Lok to Male Gland



BUL 17
Bulkhead Union to Let-Lok



Swivel Connectors



HNF 23
High Flow Nut Female



HNM 23
High Flow Nut Male



SBUL 17
Short Bulkhead Union to Let-Lok



BHUT 17
Bulkhead Union to Tube



UMF 20
Union Male to Female



MCF 21
Male Connector to Female



SBHUT 18
Short Bulkhead Union to Tube



UFF 21
Union Female to Female



FCF 21
Female Connector to Female NPT



Caps & Nuts



FHTL 22
Female HTC to Let-Lok



Gaskets



CP 18
Coupling



DFU 18
Double Female Union



NF 19
Nut Female



CF 19
Cap Female



GA 22
Gasket



GA-RT 22
Gasket Retainer



How to Order

V - GL - 1/2 - W - E

Type of Fitting Designator

Surface Level Designator

E - with electropolish
H - without electropolish

Size Designator

1/8 6mm
1/4 8mm
3/8 10mm
1/2 12mm
3/4 18mm
1

See page 83

"E" or "H" must be added at the end of the part no. to define the level of the polish:

E - with electropolish,
H - without electropolish.

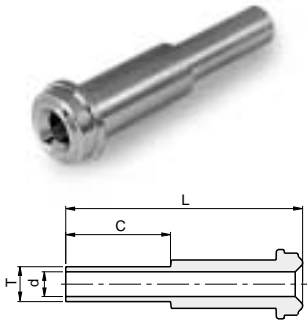
End Designator

S - With Shoulder
W - Without Shoulder

Material Designator

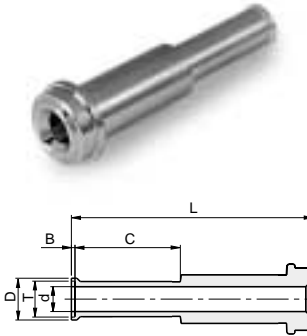
P - 316L/316L VOD
V - 316L Vim/Var
LM - Low Manganese
*Ni Nickel
*SS Stainless Steel

* For Gaskets only



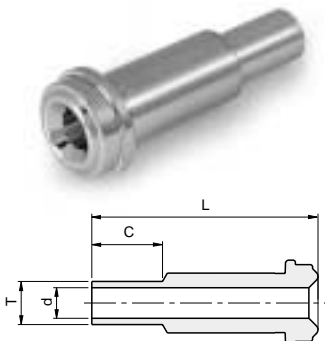
GL-W Gland Long without shoulder

PART NO.	L		C		d		T		W.T.	
	mm	inch	mm	inch	mm	inch	inch-mm	mm	inch	
V-GL-1/8-W	36.10	1.42	19.05	0.75	1.86	0.07	1/8"	-	0.028	
V-GL-1/4X1/8-W	36.10	1.42	19.05	0.75	1.86	0.07	1/8"	-	0.028	
V-GL-1/4-W	43.20	1.70	19.05	0.75	4.56	0.18	1/4"	-	0.035	
V-GL-3/8-W	45.50	1.79	19.05	0.75	7.73	0.30	3/8"	-	0.035	
V-GL-1/2-W	45.50	1.80	19.05	0.75	10.20	0.40	1/2"	-	0.049	
V-GL-1/2-W 1.41	35.80	1.41	9.60	0.38	10.2	0.40	1/2"	-	0.049	
V-GL-1/2-W W.T.=0.065	45.50	1.80	19.05	0.75	9.40	0.37	1/2"	-	0.065	
V-GL-1/2X1/4-W	45.50	1.80	19.05	0.75	4.56	0.18	1/4"	-	0.035	
V-GL-3/4-W W.T.=0.049	51.56	2.03	19.05	0.75	16.56	0.65	3/4"	-	0.049	
V-GL-3/4-W	51.56	2.03	19.05	0.75	15.75	0.62	3/4"	-	0.065	
V-GL-1-W	58.90	2.32	19.05	0.75	22.10	0.87	1"	-	0.065	
V-GL-6MM-W	43.20	1.70	19.05	0.75	4.00	0.16	6mm	1.00	-	
V-GL-8MM-W	43.20	1.70	19.05	0.75	6.00	0.24	8mm	1.00	-	
V-GL-10MM-W	45.50	1.79	19.05	0.75	8.00	0.31	10mm	1.00	-	
V-GL-12MM-W	45.50	1.79	19.05	0.75	10.00	0.39	12mm	1.00	-	
V-GL-18MM-W	51.60	2.03	19.05	0.75	15.00	0.59	18mm	1.50	-	



GL-S Gland Long with shoulder

PART NO.	L		C		d		B		D		T		W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch-mm	mm	inch	
V-GL-1/4-S	43.72	1.72	19.05	0.75	4.56	0.18	0.55	0.02	7.37	0.29	1/4"	-	0.035	
V-GL-3/8-S	46.23	1.82	19.05	0.75	7.73	0.30	0.76	0.03	10.40	0.41	3/8"	1.00	0.035	
V-GL-1/2-S	46.48	1.83	19.05	0.75	10.20	0.40	1.00	0.04	13.97	0.55	1/2"	-	0.049	
V-GL-1/2-S W.T.=0.065	46.48	1.83	19.05	0.75	9.40	0.37	1.00	0.04	13.97	0.55	1/2"	-	0.065	
V-GL-3/4-S W.T.=0.049	52.58	2.07	19.05	0.75	16.56	0.65	1.00	0.04	20.32	0.80	3/4"	-	0.049	
V-GL-3/4-S W.T.=0.065	52.58	2.07	19.05	0.75	15.75	0.62	1.00	0.04	20.32	0.80	3/4"	-	0.065	
V-GL-1-S W.T.=0.065	65.28	2.57	24.38	0.96	22.10	0.87	1.00	0.04	26.92	1.06	1"	-	0.065	
V-GL-6MM-S	43.70	1.72	19.05	0.75	4.00	0.16	0.50	0.02	6.80	0.27	6mm	1.00	-	
V-GL-8MM-S	46.23	1.82	19.05	0.75	6.00	0.24	0.80	0.03	8.90	0.35	8mm	1.00	-	
V-GL-10MM-S	46.23	1.82	19.05	0.75	8.00	0.31	0.80	0.03	10.90	0.43	10mm	1.00	-	
V-GL-12MM-S	46.50	1.83	19.05	0.75	10.00	0.39	1.00	0.04	13.20	0.52	12mm	1.00	-	
V-GL-18MM-S	52.60	2.07	19.05	0.75	15.00	0.59	1.00	0.04	19.30	0.76	18mm	1.50	-	

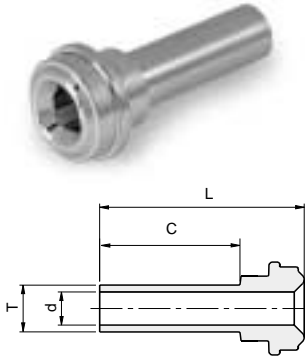


GM-W Gland Male without shoulder

PART NO.	L		d		C		T	
	mm	inch	mm	inch	mm	inch	inch-mm	
V-GM-1/8-W	17.80	0.70	1.50	0.06	7.10	0.28	1/8"	
V-GM-1/4-W	33.30	1.31	3.00	0.12	10.40	0.41	1/4"	
V-GM-3/8-W	38.10	1.50	7.10	0.28	10.40	0.41	3/8"	
V-GM-1/2-W	38.10	1.50	10.20	0.40	12.70	0.50	1/2"	
V-GM-3/4-W	50.80	2.00	13.50	0.53	15.70	0.62	3/4"	
V-GM-1-W	56.40	2.22	19.10	0.75	20.60	0.81	1"	

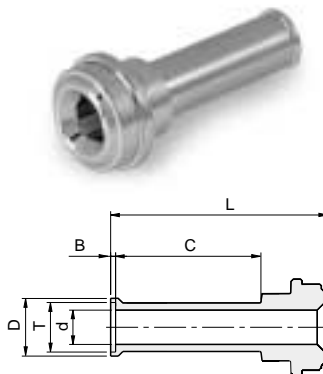
Dimensions are for reference only, and are subject to change without notice.

To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number



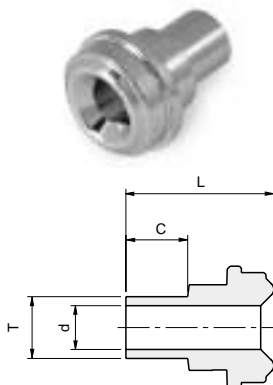
GS -W Gland Short without Shoulder

PART NO.	L		C		d		T Tube O.D inch-mm	W.T.	
	mm	inch	mm	inch	mm	inch		mm	inch
V-GS-1/8-W	27.43	1.08	19.05	0.75	1.86	0.07	1/8"	-	0.028
V-GS-1/4-W	27.94	1.10	19.05	0.75	4.56	0.18	1/4"	-	0.035
V-GS-1/4X1/8-W	27.94	1.10	19.05	0.75	1.86	0.07	1/8"	-	0.028
V-GS - 1/4-W 0.72	18.30	0.72	9.60	0.38	4.56	0.18	1/4"	-	0.035
V-GS-3/8-W	28.40	1.12	19.05	0.75	7.73	0.30	3/8"	-	0.035
V-GS-1/2-W	28.40	1.12	19.05	0.75	10.20	0.40	1/2"	-	0.049
V-GS-1/2-W W.T.=0.065	28.40	1.12	19.05	0.75	9.40	0.37	1/2"	-	0.065
V-GS-1/2-W-0.74	18.80	0.74	9.65	0.38	10.20	0.40	1/2"	-	0.049
V-GS-1/2x1/4-W	28.40	1.12	19.05	0.75	4.50	0.18	1/4"	-	0.035
V-GS-3/4-W W.T.=0.049	28.96	1.14	19.05	0.75	16.56	0.65	3/4"	-	0.049
V-GS-3/4-W W.T.=0.065	28.96	1.14	19.05	0.75	15.75	0.62	3/4"	-	0.065
V-GS-1-W W.T.=0.065	32.10	1.26	19.05	0.75	22.10	0.87	1"	-	0.065
V-GS-6MM-W	29.46	1.16	19.05	0.75	4.00	0.16	6mm	1.00	-
V-GS-8MM-W	29.46	1.16	19.05	0.75	6.00	0.24	8mm	1.00	-
V-GS-10MM-W	29.46	1.16	19.05	0.75	8.00	0.31	10mm	1.00	-
V-GS-12MM-W	29.46	1.16	19.05	0.75	10.00	0.39	12mm	1.00	-
V-GS-18MM-W	31.00	1.22	19.05	0.75	15.00	0.59	18mm	1.50	-



GS -S Gland Short with Shoulder

PART NO.	L		C		d		B		D		T Tube O.D inch-mm	W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch		mm	inch
V-GS-1/4-S	28.45	1.12	19.05	0.75	4.56	0.18	0.55	0.02	7.37	0.29	1/4"	-	0.035
V-GS-3/8-S	29.21	1.15	19.05	0.75	7.73	0.30	0.76	0.03	10.40	0.41	3/8"	-	0.035
V-GS-1/2-S	29.46	1.16	19.05	0.75	10.20	0.40	1.00	0.04	13.97	0.55	1/2"	-	0.049
V-GS-1/2-S W.T.=0.065	29.46	1.16	19.05	0.75	9.40	0.37	1.00	0.04	13.97	0.55	1/2"	-	0.065
V-GS-3/4-S W.T.=0.049	29.96	1.18	19.05	0.75	16.56	0.65	1.00	0.04	20.32	0.80	3/4"	-	0.049
V-GS-3/4-S W.T.=0.065	29.96	1.18	19.05	0.75	15.75	0.62	1.00	0.04	20.32	0.80	3/4"	-	0.065
V-GS-1-S W.T.=0.065	32.10	1.26	19.05	0.75	22.10	0.87	1.00	0.04	26.92	1.06	1"	-	0.065
V-GS-6MM-S	30.00	1.18	19.05	0.75	4.00	0.16	0.50	0.02	6.80	0.27	6mm	1.00	-
V-GS-8MM-S	30.20	1.19	19.05	0.75	6.00	0.24	0.80	0.03	8.90	0.35	8mm	1.00	-
V-GS-10MM-S	31.00	1.22	19.05	0.75	8.00	0.31	0.80	0.03	10.90	0.43	10mm	1.00	-
V-GS-12MM-S	30.50	1.20	19.05	0.75	10.00	0.39	1.00	0.04	13.20	0.52	12mm	1.00	-
V-GS-18MM-S	31.00	1.22	19.05	0.75	15.00	0.59	1.00	0.04	19.30	0.76	18mm	1.50	-



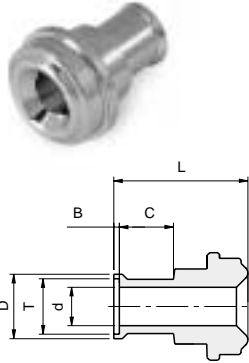
MGS -W Mini Gland Short without Shoulder

PART NO.	L		C		d		T Tube O.D inch-mm	W.T.	
	mm	inch	mm	inch	mm	inch		mm	inch
V-MGS-1/4-W	15.20	0.60	6.35	0.25	4.56	0.18	1/4"	-	0.035
V-MGS-3/8-W	15.75	0.62	6.35	0.25	7.73	0.30	3/8"	-	0.035
V-MGS-1/2-W	15.75	0.62	6.35	0.25	10.20	0.40	1/2"	-	0.049
V-MGS-1/2-W W.T.=0.065	15.75	0.62	6.35	0.25	9.40	0.37	1/2"	-	0.065
V-MGS-6MM-W	15.20	0.60	6.35	0.25	4.00	0.16	6mm	1.00	-
V-MGS-8MM-W	15.75	0.62	6.35	0.25	6.00	0.24	8mm	1.00	-
V-MGS-10MM-W	15.75	0.62	6.35	0.25	8.00	0.31	10mm	1.00	-
V-MGS-12MM-W	15.75	0.62	6.35	0.25	10.00	0.39	12mm	1.00	-

Dimensions are for reference only, and are subject to change without notice.

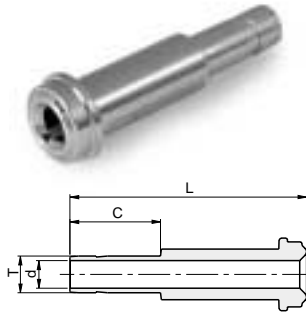
To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number

MGS -S Mini Gland Short with Shoulder



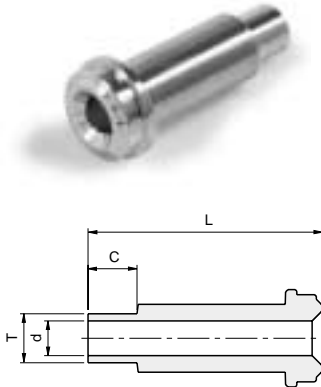
PART NO.	L		C		d		B		D		T Tube O.D		W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch-mm	mm	inch	
V-MGS-1/4-S	15.75	0.62	6.35	0.25	4.56	0.18	0.55	0.02	7.37	0.29	1/4"	-	0.035	
V-MGS-3/8-S	16.50	0.65	6.35	0.25	7.73	0.30	0.76	0.03	10.40	0.41	3/8"	-	0.035	
V-MGS-1/2-S	16.75	0.66	6.35	0.25	10.20	0.40	1.00	0.04	13.97	0.55	1/2"	-	0.049	
V-MGS-1/2-S W.T.=0.065	16.75	0.66	6.35	0.25	9.40	0.37	1.00	0.04	13.97	0.55	1/2"	-	0.065	
V-MGS-6MM-S	15.75	0.62	6.35	0.25	4.00	0.16	0.50	0.02	6.80	0.27	6mm	1.00	-	
V-MGS-8MM-S	16.50	0.65	6.35	0.25	6.00	0.24	0.80	0.03	8.90	0.35	8mm	1.00	-	
V-MGS-10MM-S	16.50	0.65	6.35	0.25	8.00	0.31	0.80	0.03	10.90	0.43	10mm	1.00	-	
V-MGS-12MM-S	16.75	0.66	6.35	0.25	10.00	0.39	1.00	0.04	13.20	0.52	12mm	1.00	-	

AG Adapter Gland



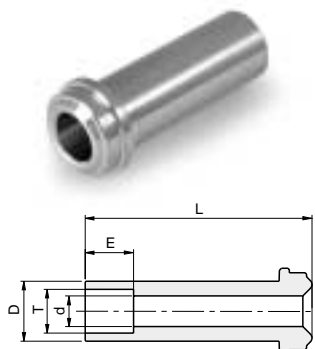
PART NO.	L		C		d		T Tube O.D
	mm	inch	mm	inch	mm	inch	inch-mm
P-AG-1/4	41.15	1.62	16.20	0.64	4.30	0.17	1/4"
P-AG-3/8	46.00	1.81	17.80	0.70	6.80	0.27	3/8"
P-AG-1/2	49.30	1.94	24.40	0.96	9.40	0.37	1/2"
P-AG-6M	41.15	1.62	15.70	0.62	4.00	0.16	6MM

MG-W Male Gland Short Tube without Shoulder



PART NO.	L		C		d		T Tube O.D		W.T.	
	mm	inch	mm	inch	mm	inch	inch-mm	mm	inch	
V-MG-1/4-W	30.50	1.20	6.35	0.25	4.56	0.18	1/4"	-	0.035	
V-MG-1/4-W 1.32	33.50	1.32	9.60	0.38	4.56	0.18	1/4"	-	0.035	
V-MG-3/8-W	32.80	1.29	6.35	0.25	7.73	0.30	3/8"	-	0.035	
V-MG-1/2-W	32.80	1.29	6.35	0.25	10.20	0.40	1/2"	1.00	0.049	
V-MG-6MM-W	30.50	1.20	6.35	0.25	4.00	0.16	6mm	1.00	-	
V-MG-8MM-W	30.50	1.20	6.35	0.25	6.00	0.24	8mm	1.00	-	
V-MG-10MM-W	32.80	1.29	6.35	0.25	8.00	0.31	10mm	1.00	-	
V-MG-12MM-W	32.80	1.29	6.35	0.25	10.00	0.39	12mm	-	-	

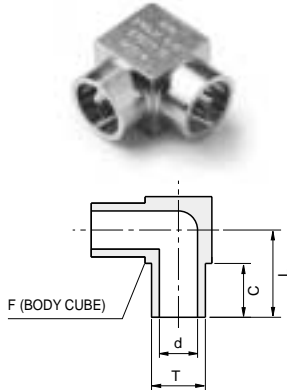
GSW Gland Socket Weld



PART NO.	L		d		E		D		T Tube O.D
	mm	inch	mm	inch	mm	inch	mm	inch	inch-mm
V-GSW-1/16	17.78	0.70	1.30	0.05	2.50	0.10	3.3	0.13	1/16"
V-GSW-1/8	17.78	0.70	2.30	0.09	2.50	0.10	5.1	0.20	1/8"
V-GSW-1/4	33.30	1.31	4.56	0.18	7.10	0.28	8.9	0.35	1/4"
V-GSW-3/8	38.10	1.50	7.73	0.30	7.90	0.31	15.2	0.60	3/8"
V-GSW-1/2	38.10	1.50	10.20	0.40	9.60	0.38	15.2	0.60	1/2"
V-GSW-3/4	50.80	2.00	15.70	0.62	11.20	0.44	22.4	0.88	3/4"
V-GSW-1	56.39	2.22	22.10	0.87	15.70	0.62	30.2	1.19	1"

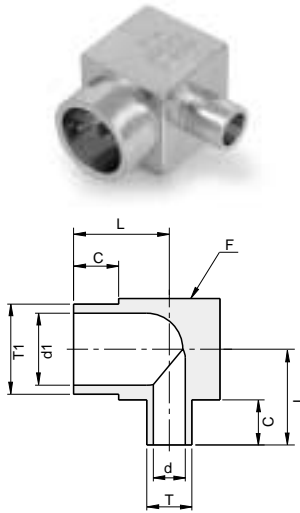
Dimensions are for reference only, and are subject to change without notice.

To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number



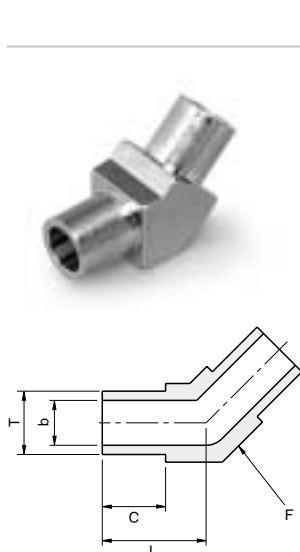
ME Mini Elbow

PART NO.	L		C		d		F	T		W.T.
	mm	inch	mm	inch	mm	inch		Tube O.D	inch-mm	
V-ME-1/8-W	10.40	0.41	6.35	0.25	1.86	0.07	5/16	1/8"	-	0.028
V-ME-1/4-W	10.40	0.41	6.35	0.25	4.56	0.18	5/16	1/4"	-	0.035
V-ME-3/8-W	11.93	0.47	6.35	0.25	7.73	0.30	7/16	3/8"	-	0.035
V-ME-1/2-W	13.53	0.53	6.35	0.25	10.2	0.40	9/16	1/2"	-	0.049
V-ME-1/2-W W.T.=0.065	13.53	0.53	6.35	0.25	9.46	0.37	9/16	1/2"	-	0.065
P-ME-3/4-W W.T.=0.065	17.37	0.68	6.35	0.25	15.81	0.62	7/8	3/4"	-	0.065
P-ME-1-W W.T.=0.065	19.83	0.78	6.35	0.25	22.16	0.87	1-1/16	1"	-	0.065
V-ME-6MM-W	10.33	0.41	6.35	0.25	4.00	0.16	5/16	6mm	1.00	-
V-ME-8MM-W	11.93	0.47	6.35	0.25	6.00	0.24	7/16	8mm	1.00	-
V-ME-10MM-W	11.93	0.47	6.35	0.25	8.00	0.31	7/16	10mm	1.00	-
V-ME-12MM-W	13.53	0.53	6.35	0.25	10.00	0.39	9/16	12mm	1.00	-



MER Mini Elbow Reducer

PART NO.	L		d1		d		C		F	T1		W.T. (T1)	T		W.T. (T)	
	mm	inch	mm	inch	mm	inch	mm	inch		inch	mm		inch	mm		inch
V-MER-1/4x1/8	10.40	0.41	4.56	0.18	1.86	0.07	6.35	0.25	5/16	1/4	-	0.035	-	1/8	-	0.028
V-MER-3/8X1/4	11.90	0.47	7.73	0.30	4.56	0.18	6.35	0.25	7/16	3/8	-	0.035	-	1/4	-	0.035
V-MER-1/2X1/4	13.53	0.53	10.20	0.40	4.56	0.18	6.35	0.25	9/16	1/2	-	0.049	-	1/4	-	0.035
V-MER-1/2X3/8	13.53	0.53	10.20	0.40	7.73	0.30	6.35	0.25	9/16	1/2	-	0.049	-	3/8	-	0.035
V-MER-8MMx6MM	11.93	0.47	6.00	0.24	4.00	0.16	6.35	0.25	7/16	-	8mm	1.00	-	6mm	1.00	-
V-MER-12MMx6MM	13.53	0.53	10.00	0.39	4.00	0.16	6.35	0.25	9/16	-	12mm	1.00	-	6mm	1.00	-
V-MER-12MMx8MM	13.53	0.53	10.00	0.39	6.00	0.24	6.35	0.25	9/16	-	12mm	1.00	-	8mm	1.00	-



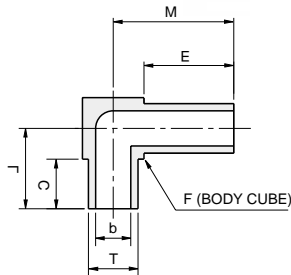
ME 45 Mini Elbow 45°

PART NO.	L		d		C		F	T		W.T.
	mm	inch	mm	inch	mm	inch		inch	Tube O.D	
V-ME-1/8-W-45DEG	10.33	0.41	1.86	0.07	6.35	0.25	5/16	1/8"	-	0.028
V-ME-1/4-W-45DEG	10.33	0.41	4.56	0.18	6.35	0.25	5/16	1/4"	-	0.035
V-ME-3/8-W-45DEG	11.93	0.47	7.73	0.30	6.35	0.25	7/16	3/8"	-	0.035
V-ME-1/2-W-45DEG	13.53	0.53	10.2	0.40	6.35	0.25	9/16	1/2"	-	0.049
V-ME-1/2-W-45DEG W.T.=0.065	13.53	0.53	9.46	0.37	6.35	0.25	9/16	1/2"	-	0.065
V-ME-6MM-W-45DEG	10.33	0.41	4.00	0.16	6.35	0.25	5/16	6MM	1.00	-
V-ME-8MM-W-45DEG	11.93	0.47	6.00	0.24	6.35	0.25	7/16	8MM	1.00	-
V-ME-10MM-W-45DEG	11.93	0.47	8.00	0.31	6.35	0.25	7/16	10MM	1.00	-
V-ME-12MM-W-45DEG	13.53	0.53	10.00	0.39	6.35	0.25	9/16	12MM	1.00	-

Dimensions are for reference only, and are subject to change without notice.

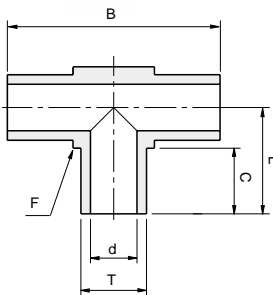
To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number

MEX Mini Elbow Extended Leg



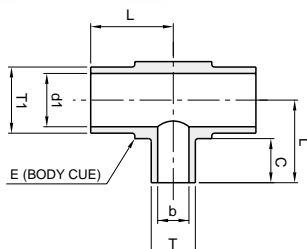
PART NO.	L		M		d		C		E		F	T		W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch		inch	inch-mm	inch	mm
V-MEX-1/4-0.41X0.66	10.33	0.41	16.66	0.66	4.56	0.18	6.35	0.25	12.70	0.50	5/16	1/4"	0.035	-	
V-MEX-1/4-0.41X0.61	10.33	0.41	15.49	0.61	4.56	0.18	6.35	0.25	11.43	0.45	5/16	1/4"	0.035	-	

MT Mini Tee



PART NO.	L		B		d		C		F	T		W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch		inch	inch-mm	mm	inch
V-MT-1/8	10.33	0.41	20.66	0.81	1.86	0.07	6.35	0.25	5/16	1/8"	-	0.028	
V-MT-1/4	10.33	0.41	20.66	0.81	4.56	0.18	6.35	0.25	5/16	1/4"	-	0.035	
V-MT-3/8	11.93	0.47	23.86	0.94	7.73	0.30	6.35	0.25	7/16	3/8"	-	0.035	
V-MT-1/2	13.53	0.53	27.06	1.07	10.2	0.40	6.35	0.25	9/16	1/2"	-	0.049	
V-MT-1/2 W.T.=0.065	13.53	0.53	27.06	1.07	9.46	0.37	6.35	0.25	9/16	1/2"	-	0.065	
P-MT-3/4 W.T.=0.065	17.37	0.68	34.74	1.37	15.81	0.62	6.35	0.25	7/8	3/4"	-	0.065	
P-MT-1 W.T.=0.065	19.83	0.78	39.66	1.56	22.16	0.87	6.35	0.25	1-1/16	1"	-	0.065	
V-MT-6MM	10.33	0.41	20.66	0.81	4.00	0.16	6.35	0.25	5/16	6MM	1.00	-	
V-MT-8MM	11.93	0.47	23.86	0.94	6.00	0.24	6.35	0.25	7/16	8MM	1.00	-	
V-MT-10MM	11.93	0.47	23.86	0.94	8.00	0.31	6.35	0.25	7/16	10MM	1.00	-	
V-MT-12MM	13.53	0.53	27.06	1.07	10.00	0.39	6.35	0.25	9/16	12MM	1.00	-	

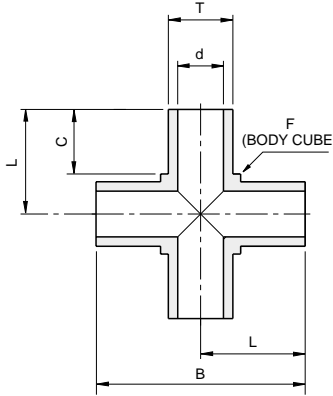
MTR Mini Tee Reducer



PART NO.	L		B		d		d1		C		F	T1		W.T. (T1)	T		W.T. (T)
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch		inch/mm	inch		mm	inch/mm	
V-MTR-1/2X1/4	13.53	0.53	27.06	1.07	4.57	0.18	10.20	0.40	6.35	0.25	9/16	1/2	0.049	-	1/4	0.035	-
V-MTR-3/8X1/4	11.93	0.47	23.86	0.94	4.57	0.18	7.70	0.30	6.35	0.25	7/16	3/8	0.035	-	1/4	0.035	1.00
V-MTR-12M6M	13.53	0.53	27.06	1.07	4.00	0.16	10.0	0.39	6.35	0.25	9/16	12MM	-	1.00	6MM	-	-

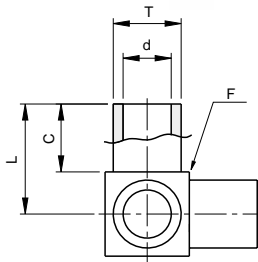
Dimensions are for reference only, and are subject to change without notice.

To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number



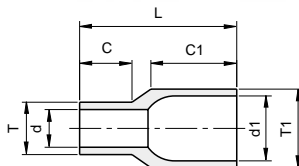
MC Mini Cross

PART NO.	L		B		d		C		F	T		W.T.		
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch-mm	mm	inch	mm	inch
V-MC-1/8	10.33	0.41	20.66	0.81	1.86	0.07	6.35	0.25	5/16	1/8"	-	0.028	-	-
V-MC-1/4	10.33	0.41	20.66	0.81	4.56	0.18	6.35	0.25	5/16	1/4"	-	0.035	-	-
V-MC-3/8	11.93	0.47	23.86	0.94	7.73	0.30	6.35	0.25	7/16	3/8"	-	0.035	-	-
V-MC-1/2	13.53	0.53	27.06	1.07	10.2	0.40	6.35	0.25	9/16	1/2"	-	0.049	-	-
V-MC-1/2-W.T.=0.065	13.53	0.53	27.06	1.07	9.46	0.37	6.35	0.25	9/16	1/2"	-	0.065	-	-
P-MC-3/4-W.T.=0.065	17.37	0.68	34.74	1.37	15.81	0.62	6.35	0.25	7/8	3/4"	-	0.065	-	-
P-MC-1-W.T.=0.065	19.83	0.78	39.66	1.56	22.16	0.87	6.35	0.25	1-1/16	1"	-	0.065	-	-
V-MC-6MM	10.33	0.41	20.66	0.81	4.00	0.16	6.35	0.25	5/16	6MM	1.00	-	-	-
V-MC-8MM	11.93	0.47	23.86	0.94	6.00	0.24	6.35	0.25	7/16	8MM	1.00	-	-	-
V-MC-10MM	11.93	0.47	23.86	0.94	8.00	0.31	6.35	0.25	7/16	10MM	1.00	-	-	-
V-MC-12MM	13.53	0.53	27.06	1.07	10.00	0.39	6.35	0.25	9/16	12MM	1.00	-	-	-



MTB Mini Tri-EL

PART NO.	L		d		C		F	T		W.T.	
	mm	inch	mm	inch	mm	inch	inch	inch-mm	inch	mm	mm
V-MTB-1/8	10.33	0.41	1.86	0.07	6.35	0.25	5/16	1/8"	0.028	-	-
V-MTB-1/4	10.33	0.41	4.56	0.18	6.35	0.25	5/16	1/4"	0.035	-	-
V-MTB-3/8	11.93	0.47	7.73	0.30	6.35	0.25	7/16	3/8"	0.035	-	-
V-MTB-1/2	13.53	0.53	10.2	0.40	6.35	0.25	9/16	1/2"	0.049	-	-
V-MTB-6MM	10.33	0.41	4.00	0.16	6.35	0.25	5/16	6MM	-	1.00	-
V-MTB-8MM	11.93	0.47	6.00	0.24	6.35	0.25	7/16	8MM	-	1.00	-
V-MTB10MM	11.93	0.47	8.00	0.31	6.35	0.25	7/16	10MM	-	1.00	-
V-MTB-12MM	13.53	0.53	10.00	0.39	6.35	0.25	9/16	12MM	-	1.00	-



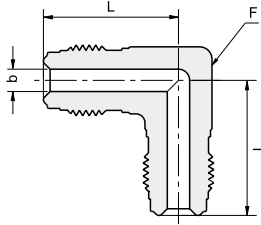
RU Reducing Union

PART NO.	L		d1		d		C1		C		T1	W.T. (T1)		T		W.T. (T)	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch	mm	inch	mm	inch	mm
V-RU-1/4x1/8	19.05	0.75	4.56	0.18	1.86	0.07	10.41	0.41	6.35	0.25	1/4	-	0.035	-	1/8	-	0.028
V-RU-3/8x1/4	19.05	0.75	7.73	0.30	4.56	0.18	10.41	0.41	6.35	0.25	3/8	-	0.035	-	1/4	-	0.035
V-RU-1/2x1/4	19.05	0.75	10.20	0.40	4.56	0.18	10.41	0.41	6.35	0.25	1/2	-	0.049	-	1/4	-	0.035
V-RU-1/2x3/8	19.05	0.75	10.20	0.40	7.73	0.30	10.41	0.41	6.35	0.25	1/2	-	0.049	-	3/8	-	0.035
P-RU-1x1/2	19.05	0.75	22.16	0.87	10.20	0.40	10.41	0.41	6.35	0.25	1	-	0.065	-	1/2	-	0.049
V-RU-8MMx6MM	19.05	0.75	6.00	0.24	4.00	0.16	10.41	0.41	6.35	0.25	8mm	1.00	1.00	6mm	1.00	1.00	1.00
V-RU-10MMx6MM	19.05	0.75	8.00	0.31	4.00	0.16	10.41	0.41	6.35	0.25	10mm	1.00	1.00	6mm	1.00	1.00	1.00
V-RU-10MMx8MM	19.05	0.75	8.00	0.31	6.00	0.24	10.41	0.41	6.35	0.25	10mm	1.00	1.00	8mm	1.00	1.00	1.00
V-RU-12MMx6MM	19.05	0.75	10.00	0.39	4.00	0.16	10.41	0.41	6.35	0.25	12mm	1.00	1.00	6mm	1.00	1.00	1.00
V-RU-12MMx8MM	19.05	0.75	10.00	0.39	6.00	0.24	10.41	0.41	6.35	0.25	12mm	1.00	1.00	8mm	1.00	1.00	1.00
V-RU-12MMx10MM	19.05	0.75	10.00	0.39	8.00	0.31	10.41	0.41	6.35	0.25	12mm	1.00	1.00	10mm	1.00	1.00	1.00

Dimensions are for reference only, and are subject to change without notice.

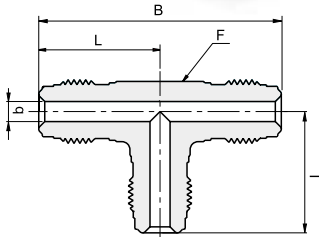
To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number

EU Elbow Union



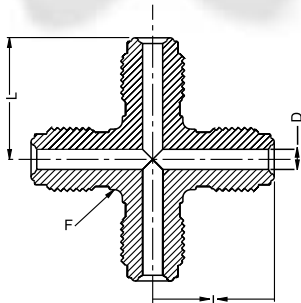
PART NO.	L		d		F	T
	mm	inch	mm	inch	inch	Tube O.D inch-mm
P-EU-1/4	27.20	1.07	4.56	0.18	1/2	1/4"
P-EU-1/2	36.83	1.45	10.20	0.40	13/16	1/2"
P-EU-3/4	48.80	1.92	15.76	0.62	1-1/4	3/4
P-EU-1	50.80	2.00	22.16	0.87	1-11/16	1"

TU Tee Union



PART NO.	L		M		d		F	T
	mm	inch	mm	inch	mm	inch	inch	Tube O.D inch
P-TU-1/4	27.20	1.07	54.40	2.14	4.56	0.18	1/2	1/4"
P-TU-1/2	36.83	1.45	73.66	2.90	10.20	0.40	13/16	1/2"
P-TU-3/4	48.80	1.92	97.60	3.84	15.76	0.62	1-1/4	3/4
P-TU-1	50.80	2.00	101.60	4.00	22.16	0.87	1-11/16	1"

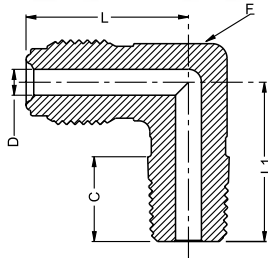
CU Cross Union



PART NO.	L		D		Thread Size	F	
	mm	inch	mm	inch		mm	inch
P-CU-1/4	27.20	1.07	4.56	0.18	9/16-18	12.90	1/2
P-CU-1/2	36.83	1.45	10.20	0.40	7/8-14	20.60	13/16

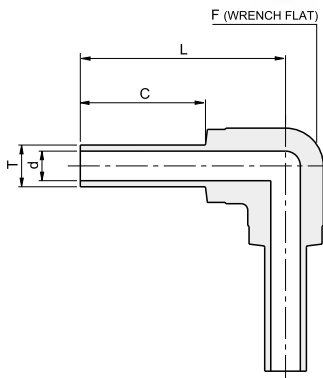
Dimensions are for reference only, and are subject to change without notice.

To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number



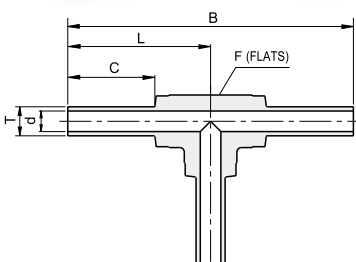
EM Elbow Male

PART NO.	L		L1		C		d		F	T		P
	mm	inch	mm	inch	mm	inch	mm	inch		inch-mm	inch-mm	
P-EM-1/4x1/8	27.20	1.07	22.10	0.87	9.60	0.38	4.56	0.18	1/2	1/4"	1/8"	
P-EM-1/4x1/4	27.20	1.07	26.70	1.05	14.20	0.56	4.56	0.18	1/2	1/4"	1/4"	
P-EM-1/2X1/4	36.83	1.45	32.00	1.26	14.20	0.56	10.2	0.40	15/16	1/2"	1/4"	
P-EM-1/4X1/2	31.20	1.23	33.50	1.32	19.00	0.75	4.56	0.18	15/16	1/4"	1/2"	
P-EM-1/2x3/8	36.83	1.45	32.00	1.26	14.20	0.56	10.20	0.40	13/16	1/2"	3/8"	
P-EM-1/2X1/2	36.83	1.45	36.80	1.45	19.10	0.75	10.20	0.40	13/16	1/2"	1/2"	



EW-W Elbow AW without Shoulder

PART NO.	L		d		C		F	T		W.T.	
	mm	inch	mm	inch	mm	inch		inch	inch-mm	inch	mm
P-EW-1/4-W	31.24	1.23	4.56	0.18	19.05	0.75	7/16	1/4"	0.035	-	
P-EW-3/8-W	30.48	1.20	7.73	0.30	19.05	0.75	7/16	3/8"	0.035	-	
P-EW-1/2-W	34.04	1.34	10.20	0.40	19.05	0.75	11/16	1/2"	0.049	-	
P-EW-1/2-W W.T.=0.065	34.04	1.34	9.46	0.37	19.05	0.75	11/16	1/2"	0.065	-	
P-EW-3/4-W	37.1	1.46	16.5	0.65	19.05	0.75	15/16	3/4"	0.049	-	
P-EW-1-W W.T.=0.065	47.00	1.85	22.16	0.87	19.05	0.75	1-3/8	1"	0.065	-	
P-EW-1-W W.T.=0.120	47.00	1.85	19.36	0.76	19.05	0.75	1-3/8	1"	0.120	-	
P-EW-6MM-W	31.24	1.23	4.00	0.16	19.05	0.75	7/16	6MM	-	1.00	
P-EW-8MM-W	30.48	1.20	6.00	0.24	19.05	0.75	7/16	8MM	-	1.00	
P-EW-10MM-W	30.48	1.20	8.00	0.31	19.05	0.75	11/16	10MM	-	1.00	
P-EW-12MM-W	34.04	1.34	10.00	0.39	19.05	0.75	11/16	12MM	-	1.00	
P-EW-12MM-W 2.00MM WT	33.00	1.30	8.00	0.31	19.05	0.75	11/16	12MM	-	1.00	

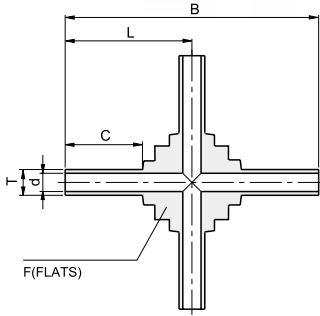


TW-W Tee AW without Shoulder

PART NO.	L		B		d		C		F	T		W.T. (T)	
	mm	inch	mm	inch	mm	inch	mm	inch		inch	mm	inch	mm
P-TW-1/4-W	31.24	1.23	62.48	2.46	4.56	0.18	19.05	0.75	7/16	1/4"	0.035	-	
P-TW-3/8-W	30.48	1.20	60.96	2.40	7.73	0.30	19.05	0.75	7/16	3/8"	0.035	-	
P-TW-1/2-W	34.04	1.34	68.08	2.68	10.20	0.40	19.05	0.75	11/16	1/2"	0.049	-	
P-TW-1/2-W W.T.=0.065	34.04	1.34	68.08	2.68	9.46	0.37	19.05	0.75	11/16	1/2"	0.065	-	
P-TW-1-W W.T.=0.065	47.00	1.85	94.00	3.70	22.16	0.87	19.05	0.75	1-3/8	1"	0.065	-	
P-TW-1-W W.T.=0.120	47.00	1.85	94.00	3.70	19.36	0.76	19.05	0.75	1-3/8	1"	0.120	-	
P-TW-6MM-W	31.24	1.23	62.48	2.46	4.00	0.16	19.05	0.75	7/16	6MM	-	1.00	
P-TW-8MM-W	30.20	1.23	60.96	2.40	6.00	0.24	19.05	0.75	7/16	8MM	-	1.00	
P-TW-10MM-W	34.00	1.34	60.96	2.40	8.00	0.31	19.05	0.75	11/16	10MM	-	1.00	
P-TW-12MM-W	34.00	1.34	68.08	2.68	10.00	0.39	19.05	0.75	11/16	12MM	-	1.00	

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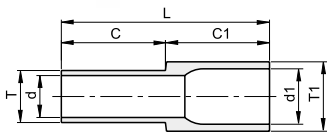
To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number



CW-W Cross AW without Shoulder

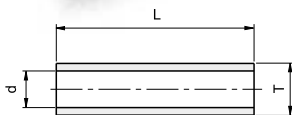
PART NO.	L		B		d		C		F	T		W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch	mm	inch	mm
P-CW-1/4-W	31.24	1.23	62.48	2.46	4.56	0.18	19.05	0.75	7/16	1/4"	0.035	-	
P-CW-3/8-W	30.48	1.20	60.96	2.40	7.73	0.30	19.05	0.75	7/16	3/8"	0.035	-	
P-CW-1/2-W	34.04	1.34	68.08	2.68	10.20	0.40	19.05	0.75	11/16	1/2"	0.049	-	
P-CW-1/2-W W.T.=0.065	34.04	1.34	68.08	2.68	9.46	0.37	19.05	0.75	11/16	1/2"	0.065	-	
P-CW-1-W W.T.=0.065	47.00	1.85	94.00	3.70	22.16	0.87	19.05	0.75	1-3/8	1"	0.065	-	
P-CW-1-W W.T.=0.120	47.00	1.85	94.00	3.70	19.36	0.76	19.05	0.75	1-3/8	1"	0.120	-	
P-CW-6MM-W	31.24	1.23	62.48	2.46	4.00	0.16	19.05	0.75	7/16		6MM	-	1.00
P-CW-8MM-W	31.20	1.23	60.96	2.40	6.00	0.24	19.05	0.75	7/16		8MM	-	1.00
P-CW-10MM-W	34.00	1.34	60.96	2.40	8.00	0.31	19.05	0.75	5/8		10mm	-	1.00
P-CW-12MM-W	34.00	1.34	68.08	2.68	10.00	0.39	19.05	0.75	5/8		12MM	-	1.00

RW-W Reducer AW without Shoulder



PART NO.	L		d1		d		C1		C		T1		W.T.		T1		W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	mm	inch	mm	inch	mm	inch	mm
V-RW-1/4x1/8	38.1	1.50	4.56	0.18	1.86	0.07	19.05	0.75	19.05	0.75	1/4	0.035	1/8	0.028				
V-RW-3/8x1/4-W	38.1	1.50	7.73	0.30	4.56	0.18	19.05	0.75	19.05	0.75	3/8	0.035	1/4	0.035				
V-RW-1/2X1/4-W	38.1	1.50	10.20	0.40	4.56	0.18	19.05	0.75	19.05	0.75	1/2	0.049	1/4	0.035				
V-RW-1/2X3/8-W	38.1	1.50	10.20	0.40	7.73	0.30	19.05	0.75	19.05	0.75	1/2	0.049	3/8	0.035				
V-RW-1x1/2-WT.065x.049	40.46	1.59	22.16	0.87	10.26	0.40	19.05	0.75	19.05	0.75	1	0.065	1/2	0.049				
V-RW-8MMx6MM	38.1	1.50	6.00	0.24	4.00	0.16	19.05	0.75	19.05	0.75	8mm	1.00	6mm	1.00				
V-RW-10MMx6MM	38.1	1.50	8.00	0.31	4.00	0.16	19.05	0.75	19.05	0.75	10mm	1.00	6mm	1.00				
V-RW-10MMx8MM	38.1	1.50	8.00	0.31	6.00	0.24	19.05	0.75	19.05	0.75	10mm	1.00	8mm	1.00				
V-RW-12MMx6MM	38.1	1.50	10.00	0.39	4.00	0.16	19.05	0.75	19.05	0.75	12mm	1.00	6mm	1.00				
V-RW-12MMx8MM	38.1	1.50	10.00	0.39	6.00	0.24	19.05	0.75	19.05	0.75	12mm	1.00	8mm	1.00				
V-RW-12MMx10MM	38.1	1.50	10.00	0.39	8.00	0.31	19.05	0.75	19.05	0.75	12mm	1.00	10mm	1.00				

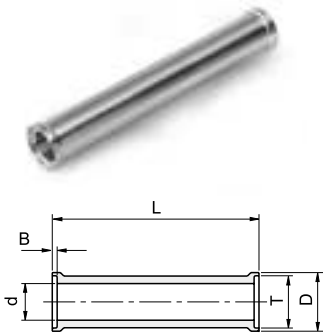
UB-W Union Buttweld without Shoulder



PART NO.	L		d		T		W.T.	
	mm	inch	mm	inch	inch-mm	mm	inch	
V-UB-1/4-W	24.30	0.96	4.56	0.18	1/4"	-	0.035	
V-UB-3/8-W	23.88	0.94	7.73	0.30	3/8"	-	0.035	
V-UB-1/2-W	23.37	0.92	10.2	0.40	1/2"	-	0.049	
V-UB-3/4-W	23.37	0.92	15.81	0.62	3/4"	-	0.065	
V-UB-1-W	29.72	1.17	22.16	0.87	1"	-	0.065	

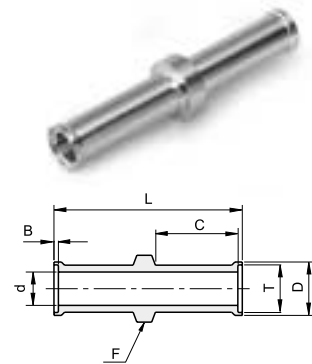
Dimensions are for reference only, and are subject to change without notice.

To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number



UB-S Union Butt weld with Shoulder

PART NO.	L		d		B		D		T		W.T.
	mm	inch	mm	inch	mm	inch	mm	inch	inch	Tube O.D	
V-UB-1/4-S	25.40	1.00	4.56	0.18	0.55	0.02	7.37	0.29	1/4"	-	0.035
V-UB-3/8-S	25.40	1.00	7.73	0.30	0.76	0.03	10.40	0.41	3/8"	-	0.035
V-UB-1/2-S	25.40	1.00	10.2	0.40	1.00	0.04	13.97	0.55	1/2"	-	0.049
P-UB-3/4-S	25.40	1.00	15.81	0.62	1.00	0.04	20.32	0.80	3/4"	-	0.065
V-UB-1-W-S	31.75	1.25	22.16	0.87	1.00	0.04	26.92	1.06	1"	-	0.065

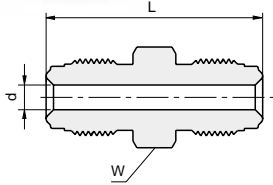


UBL-S Union Butt weld with Locator and Shoulder

PART NO.	L		C		d		B		D		F		T		W.T.
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	mm	
V-UBL-1/4-S	42.93	1.69	19.05	0.75	4.56	0.18	0.55	0.022	7.37	0.29	9.14	0.36	1/4"	0.035	-
V-UBL-3/8-S	43.43	1.71	19.05	0.75	7.73	0.30	0.76	0.030	10.40	0.41	10.67	0.42	3/8"	0.035	-
V-UBL-1/2-S	43.94	1.73	19.05	0.75	10.2	0.40	1.00	0.04	13.97	0.55	15.24	0.60	1/2"	0.049	-

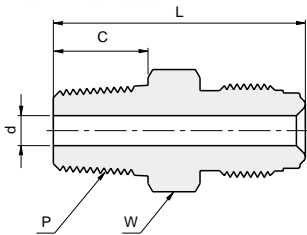
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To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number



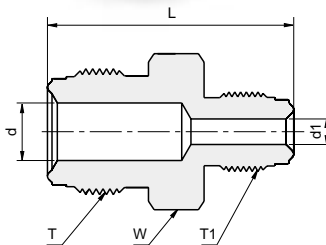
UM Union Male

PART NO.	L		d		T	W	
	mm	inch	mm	inch	Tube O.D inch	mm	inch
P-UM 1/4	39.40	1.55	4.560	0.18	1/4	15.87	5/8
P-UM 1/2	46.70	1.84	10.20	0.40	1/2	23.81	15/16
P-UM 3/4	62.00	2.44	15.70	0.62	3/4	33.34	1-5/16
P-UM 1	65.80	2.59	22.10	0.87	1	41.28	1-5/8



CM Connector Male to Male NPT

PART NO.	L		C		d		W	T	P
	mm	inch	mm	inch	mm	inch	inch	Tube O.D inch-mm	NPT-M inch-mm
P-CM-1/4x1/8	33.30	1.31	9.60	0.38	4.560	0.18	5/8	1/4"	1/8"
P-CM-1/4x1/4	37.80	1.49	14.20	0.56	4.560	0.18	5/8	1/4"	1/4"
P-CM 1/4 X 1/2	42.60	1.68	19.00	0.75	4.560	0.18	1"	1/4"	1/2"
P-CM-1/4XR1/4-H BSPT	37.80	1.49	14.20	0.56	4.560	0.18	5/8	1/4"	1/4" BSPT
P-CM-1/2x1/4	41.90	1.65	14.20	0.56	10.20	0.40	15/16	1/2"	1/4"
P-CM-1/2x3/8	41.90	1.65	14.20	0.56	10.20	0.40	15/16	1/2"	3/8"
P-CM-1/2X1/2	46.70	1.84	19.10	0.75	10.20	0.40	15/16	1/2"	1/2"
P-CM-3/4x3/4	55.60	2.19	19.00	0.75	15.76	0.62	1-5/16	3/4"	3/4"
P-CM-1x1	62.70	2.47	23.90	0.94	22.16	0.87	1-5/8	1"	1"



RUM Reducing Union Male

PART NO.	T	T1	L		d		d1		T	T1	W	
	Tube size inch	Tube size inch	mm	inch	mm	inch	mm	inch	inch	inch	mm	inch
P-RUM 1/2x1/4	1/2	1/4	43.40	1.71	10.20	0.40	4.56	0.18	7/8-14	9/16-18	23.81	15/16

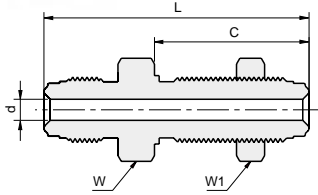
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To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number

BU Bulkhead Union



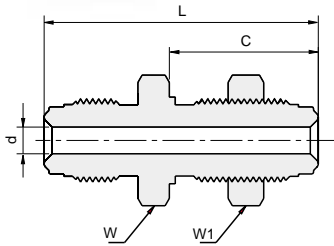
PART NO.	L		C		d		T		W		W1	
	mm	inch	mm	inch	mm	inch	Tube O.D	Thread	mm	inch	mm	inch
P-BU 1/4	56.60	2.23	33.00	1.30	4.50	0.18	1/4	9/16-18	19.05	3/4	19.05	3/4
P-BU 1/2	65.30	2.57	37.60	1.48	10.14	0.40	1/2	7/8-14	26.99	1-1/16	26.99	1-1/16



SBU Short Bulkhead Union



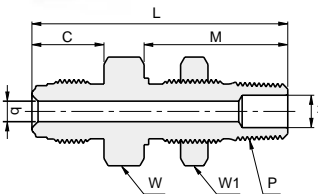
PART NO.	L		C		d		T	T1	W		W1		Panel Hole Size
	mm	inch	mm	inch	mm	inch	Tube O.D	Thread O.D	mm	inch	mm	inch	
P-SBU 1/4	46.20	1.82	25.10	0.99	4.50	0.18	1/4	9/16-18	19.05	3/4	19.05	3/4	19/32
P-SBU 1/2	54.40	2.14	28.20	1.11	10.14	0.40	1/2	7/8-14	26.99	1-1/16	26.99	1-1/16	29/32



BCM NPT Bulkhead



PART NO.	P	L		M		C		d		d1		T	W		W1		Panel Hole Size
	Male NPT Size	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	Theard Size	mm	inch	mm	inch	
P-BCM 1/4X1/4	1/4	56.10	2.21	31.50	1.24	15.80	0.62	4.56	0.18	7.10	0.28	9/16-18	20.64	13/16	20.64	13/16	19/32
P-BCM 1/2X1/4	1/2	59.40	2.34	31.50	1.24	17.80	0.70	10.20	0.40	7.10	0.28	7/8-14	23.81	15/16	20.64	13/16	29/32



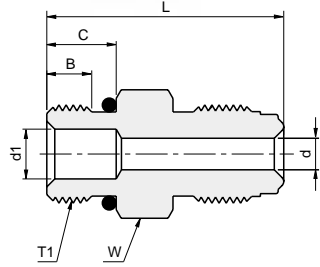
Dimensions are for reference only, and are subject to change without notice.

To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number

CMOB Connector Male to O-ring seal



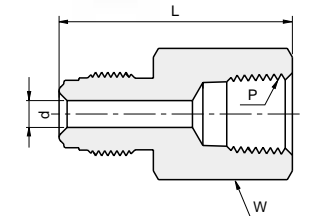
PART NO.	L		C		B		d		d1		T	T1	W		O-ring Size
	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	Tube O.D.	Thread O.D.	mm	inch	
P-CMOB 1/4X9/16	33.80	1.33	9.90	0.39	6.40	0.25	4.56	0.18	7.10	0.28	1/4	9/16-18	19.05	3/4	3-906
P-CMOB 1/2X7/8	42.20	1.66	12.70	0.50	10.20	0.40	7.10	0.28	15.0	0.59	1/2	7/8-14	25.40	1	3-910
P-CMOB 1/2X9/16	37.60	1.48	9.90	0.39	6.40	0.25	7.10	0.28	7.10	0.28	1/2	9/16-18	23.81	15/16	3-906



FC Female Connector NPT



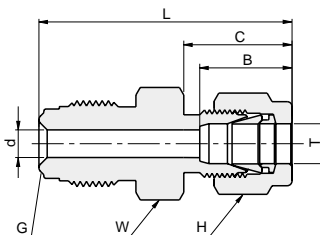
PART NO.	P Male NPT size	L		d		T	T	W	
		mm	inch	mm	inch	Tube O.D.	Thread	mm	inch
P-FC 1/4X1/8	1/8	35.80	1.41	4.50	0.18	1/4	9/16-18	15.87	5/8
P-FC 1/4X1/4	1/4	39.10	1.54	4.50	0.18	1/4	9/16-18	19.05	3/4
P-FC 1/2X1/4	1/4	39.10	1.54	10.14	0.40	1/2	7/8-14	23.81	15/16
P-FC 1/2X3/8	3/8	44.70	1.76	10.14	0.40	1/2	7/8-14	23.81	15/16
P-FC 1/2X1/2	1/2	50.50	1.99	10.14	0.40	1/2	7/8-14	26.99	1-1/16
P-FC 3/4X3/4	3/4	59.90	2.36	15.70	0.62	3/4	1-1/4-18	33.34	1-5/16
P-FC 1X1	1	63.80	2.51	22.10	0.87	1	1-1/2-20	41.28	1-5/8



UGL Let-Lok to Male Gland



PART NO.	L		C		B		d		T	W		H	
	mm	inch	mm	inch	mm	inch	mm	inch	Tube O.D.	mm	inch	mm	inch
P-UGL 1/4 X 1/8	38.90	1.53	15.20	0.60	12.7	0.50	2.30	0.09	1/8	15.87	5/8	11.10	7/16
P-UGL 1/4 X 1/4	41.10	1.62	17.80	0.70	15.20	0.60	4.56	0.18	1/4	15.87	5/8	14.30	9/16
P-UGL 1/4 X 3/8	42.20	1.66	19.40	0.76	16.80	0.66	4.56	0.18	3/8	15.87	5/8	17.4	11/16
P-UGL 1/2 X 3/8	46.70	1.84	19.40	0.76	16.80	0.66	7.10	0.28	3/8	23.81	15/16	17.46	11/16
P-UGL 1/2 X 1/2	49.50	1.95	21.80	0.86	22.90	0.90	10.14	0.40	1/2	23.81	15/16	22.23	7/8



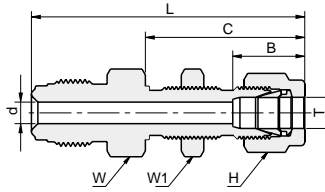
Dimensions are for reference only, and are subject to change without notice.

To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number

BUL Bulkhead Union to Let-Lok



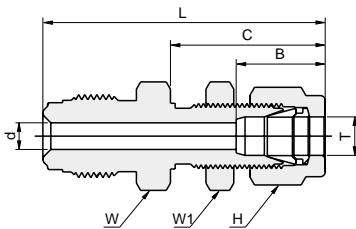
PART NO.	G		L		C		B		d		T Tube O.D.	W		W1		H	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm		mm	inch	mm	inch	mm	inch
P-BUL 1/4X1/4	1/4		57.20	2.25	33.50	1.32	15.20	0.60	4.56	0.18	1/4	15.87	5/8	15.87	5/8	14.30	9/16
P-BUL 1/2X3/8	1/2		64.50	2.54	36.80	1.45	16.80	0.66	7.10	0.28	1/2	23.81	15/16	19.05	3/4	17.46	11/16
P-BUL 1/2X1/2	1/2		69.90	2.74	41.90	1.65	22.90	0.90	10.14	0.40	1/2	23.81	15/16	23.81	15/16	22.23	7/8



SBUL Short Bulkhead Union to Let-Lok



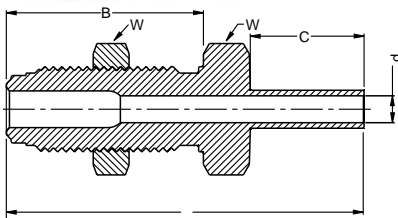
PART NO.	L		C		B		d		T Tube O.D.	W		W1		H	
	mm	inch	mm	inch	mm	inch	mm	mm		mm	inch	mm	inch	mm	inch
P-SBUL 1/4X1/4	47.80	1.88	26.70	1.05	15.20	0.60	4.56	0.18	1/4	15.87	5/8	15.87	5/8	14.30	9/16



BHUT Bulkhead Union to Tube

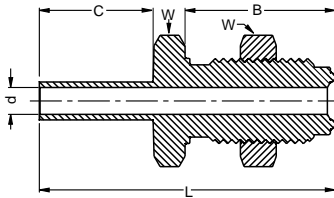


PART NO.	L		B		C		d		W	T Tube O.D.
	mm	inch	mm	inch	mm	inch	mm	inch		
P-BHUT-1/4	59.90	2.36	33.00	1.30	19.05	0.75	4.56	0.18	3/4	1/4
P-BHUT-1/2	66.55	2.62	37.60	1.48	19.05	0.75	10.20	0.40	1-1/16	1/2



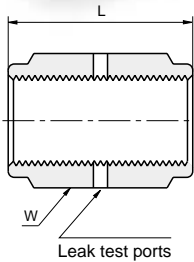
Dimensions are for reference only, and are subject to change without notice.
To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number

SBHUT Short Bulkhead Union to Tube



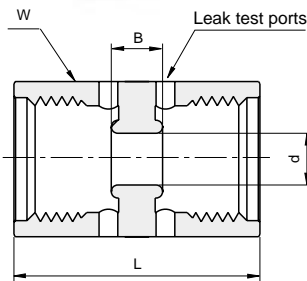
PART NO.	L		B		C		d		W	T1
	mm	inch	mm	inch	mm	inch	mm	inch	inch	Tube O.D. inch
P-SBHUT-1/4	49.50	1.95	25.14	0.99	19.05	0.75	4.56	0.18	3/4	1/4
P-SBHUT-1/2	58.96	2.31	29.74	1.17	19.05	0.75	10.14	0.40	1-1/16	1/2

CP Coupling



PART NO.	L		Thread size	W		T
	mm	inch		mm	inch	Tube O.D.
P-CP 1/4	30.20	1.19	9/16-18	19.05	3/4	1/4
P-CP 1/2	33.30	1.31	7/8-14	27.00	1-1/16	1/2
P-CP 3/4	42.70	1.68	1-1/4-18	38.10	1-1/2	3/4
P-CP 1	51.80	2.04	1-1/2-20	44.45	1-3/4	1

DFU Double Female Union

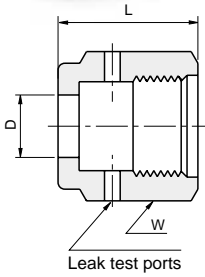


PART NO.	L		B		d		W	T
	mm	inch	mm	inch	mm	inch	inch	Tube O.D. inch
P-DFU-1/4	30.20	1.19	6.00	0.24	6.35	0.25	3/4	1/4
P-DFU-1/2	33.30	1.31	6.00	0.24	14.05	0.55	1-1/16	1/2

Caution: This fitting should be used with a swivel male connector only.

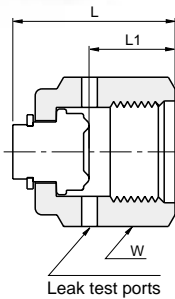
Dimensions are for reference only, and are subject to change without notice.

To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number



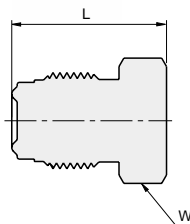
NF Nut Female

PART NO.	L		D		Thread size	T Tube O.D.	W	
	mm	inch	mm	inch			mm	inch
P-NF 1/8	13.60	0.54	5.25	0.21	5/16-24	1/8	11.11	7/16
P-NF 1/4	20.60	0.81	9.20	0.36	9/16-18	1/4	19.05	3/4
P-NF 1/2	22.50	0.88	15.50	0.61	7/8-14	1/2	27.00	1-1/16
P-NF 3/4	28.45	1.12	22.60	0.89	1-1/4-18	3/4	38.10	1-1/2
P-NF 1	34.00	1.34	30.60	1.20	1-1/2-20	1	44.45	1-3/4



CF Cap Female

PART NO.	L		L1		Thread size	T Tube O.D.	W	
	mm	inch	mm	inch			mm	inch
P-CF 1/8	16.60	0.65	8.4	0.33	5/16	1/8	11.11	7/16
P-CF 1/4	23.88	0.94	12.70	0.50	9/16-18	1/4	19.05	3/4
P-CF 1/2	25.55	1.01	14.20	0.56	7/8-14	1/2	27.00	1-1/16
P-CF 3/4	32.15	1.27	19.00	0.75	1-1/4-18	3/4	38.10	1-1/2
P-CF 1	38.96	1.53	23.26	0.92	1-1/2-20	1	44.45	1-3/4



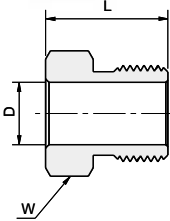
MP Male Plug

PART NO.	L		Thread size	T Tube O.D.	W	
	mm	inch			mm	inch
P-MP 1/8	17.3	0.68	5/16	1/8	9.52	3/8
P-MP 1/4	23.40	0.92	9/16-18	1/4	15.87	5/8
P-MP 1/2	27.40	1.08	7/8-14	1/2	23.81	15/16
P-MP 3/4	36.30	1.43	1-1/4-18	3/4	33.34	1-5/16
P-MP 1	38.60	1.52	1-1/2-20	1	41.28	1-5/8

Dimensions are for reference only, and are subject to change without notice.

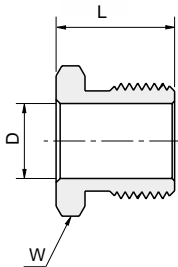
To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number

NM Nut Male



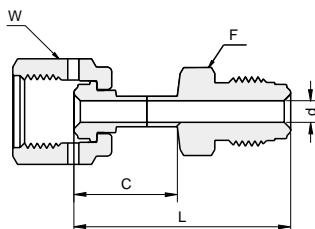
PART NO.	L		D		Thread size	T Tube O.D.	W	
	mm	inch	mm	inch			mm	inch
P-NM 1/8	12.70	0.50	5.30	0.21	5/16-24	1/8	9.53	3/8
P-NM 1/4	18.00	0.71	9.20	0.36	9/16-18	1/4	15.87	5/8
P-NM 1/2	20.60	0.81	15.50	0.61	7/8-14	1/2	23.81	15/16
P-NM 3/4	25.50	1.00	22.70	0.89	1-1/4-18	3/4	33.34	1-5/16
P-NM 1	30.20	1.19	30.50	1.20	1-1/2-20	1	41.28	1-5/8

SNM Short Nut Male



PART NO.	L		D		Thread size	T Tube O.D.	W inch
	mm	inch	mm	inch			
P-SNM 1/4 .54	13.72	0.54	9.20	0.36	9/16-18	1/4	5/8
P-SNM 1/4 .65	16.51	0.65	9.20	0.36	9/16-18	1/4	5/8

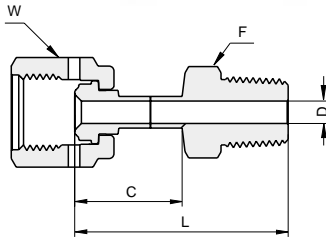
UMF Male to Female



PART NO.	L		C		d		F	W	d	T Tube inch
	mm	inch	mm	inch	mm	inch	inch	inch	inch	
P-UMF-1/4	45.15	1.78	21.55	0.85	4.56	0.18	5/8	3/4	3/4	1/4
P-UMF-1/2	49.80	1.96	22.1	0.87	10.14	0.40	15/16	1-1/16	1-1/16	1/2

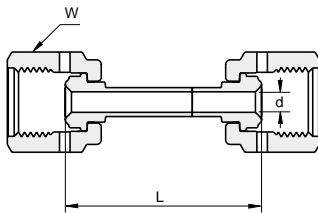
Dimensions are for reference only, and are subject to change without notice.
To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number

MCF Male Connector to Female



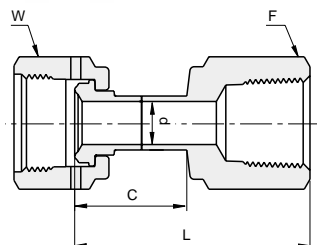
PART NO.	L		C		d		W	F	T1 Tube
	mm	inch	mm	inch	mm	inch	inch	inch	inch
P-MCF-1/4	45.50	1.79	23.40	0.92	4.56	0.18	3/4	9/16	1/4
P-MCF-1/2	53.10	2.09	25.60	1.01	10.14	0.40	1-1/16	7/8	1/2

UFF Union Female to Female



PART NO.	L		d		W	T Tube
	mm	inch	mm	inch	inch	inch
P-UFF-1/4	43.05	1.69	4.56	0.18	3/4	1/4
P-UFF-1/2	48.55	1.91	10.14	0.40	1-1/16	1/2

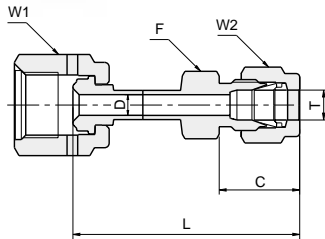
FCF Female Connector to Female NPT



PART NO.	L		C		d		F	W	T Tube
	mm	inch	mm	inch	mm	inch	inch	inch	inch
P-FCF-1/4	45.00	1.77	23.40	0.92	4.56	0.18	3/4	3/4	1/4"
P-FCF-1/2	55.40	2.18	26.40	1.04	10.14	0.40	1-1/16	1-1/16	1/2"

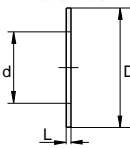
Dimensions are for reference only, and are subject to change without notice.
To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number

FHTL Female HTC to Let-Lok



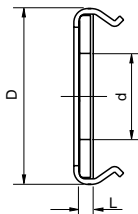
PART NO.	L		C		d		F	W1 Tube	W2 Tube	T Tube O.D.	T1 Tube
	mm	inch	mm	inch	mm	inch	inch	inch	inch	inch	inch
P-FHTL-1/4X1/4	49.30	1.94	17.80	0.70	4.56	0.18	1/2	3/4	9/16	1/4	1/4
P-FHTL-1/2X1/2	56.60	2.23	21.80	0.86	10.14	0.40	13/16	1-1/16	7/8	1/2	1/2

GA Gasket



PART NO.	D		d		L	
	mm	inch	mm	inch	mm	inch
GA-1/4 - E	11.9	0.47	5.6	0.22	0.70	0.028
GA-1/2 - E	19.8	0.78	11.2	0.44	0.70	0.028
GA-3/4 - E	29.0	1.14	16.8	0.66	0.70	0.028
GA-1 - E	35.6	1.40	22.6	0.89	0.70	0.028

GA-RT Gasket Retained

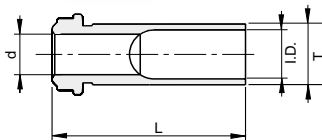


PART NO.	D		d		L	
	mm	inch	mm	inch	mm	inch
GA-1/4 - E	12.7	0.50	6.1	0.24	0.70	0.028
GA-1/2 - E	20.07	0.79	11.1	0.44	0.70	0.028
GA-3/4 - E	29.0	1.14	16.8	0.66	0.70	0.028
GA-1 - E	35.6	1.40	22.6	0.89	0.70	0.028

Dimensions are for reference only, and are subject to change without notice.

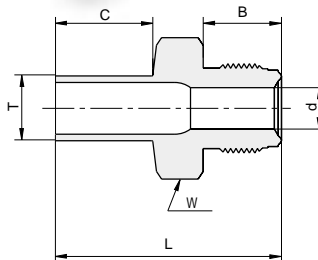
To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number

HGL - High Flow Gland Long



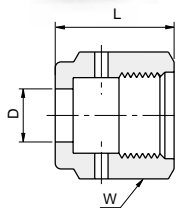
PART NO.	L		T Tube		I.D.		d	
	mm	inch	mm	inch	mm	inch	mm	inch
V-HGL-3/8 - 0.6	15.24	0.60	9.52	3/8	7.67	0.30	6.35	0.25
V-HGL-3/8 - 1.13	28.70	1.13	9.52	3/8	7.67	0.30	6.35	0.25
V-HGL-3/8 - 1.19	30.22	1.19	9.52	3/8	7.67	0.30	6.35	0.25
V-HGL-3/8 - 1.31	33.27	1.31	9.52	3/8	7.67	0.30	6.35	0.25

HMT High Flow Male to Tube



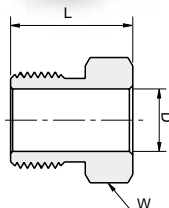
PART NO.	L		B		C		d		W	T Tube
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch
P- HMT 1/4	42.67	1.68	15.8	0.62	19.05	0.75	6.35	0.25	5/8	3/8

HNF High Flow Nut Female



PART NO.	L		D		Thread size	T Tube O.D.	W	
	mm	inch	mm	inch			mm	inch
P- HNF 1/4	20.60	0.81	10.0	0.40	9/16-18	1/4	19.05	3/4

HNM High Flow Nut Male



PART NO.	L		D		Thread size	T Tube O.D.	W	
	mm	inch	mm	inch			mm	inch
P-NM 1/4	18.00	0.71	10.0	0.4	9/16-18	3/8	15.87	5/8

Dimensions are for reference only, and are subject to change without notice.
To complete ordering number, add the surface finish designator either H or E (see Material table page 24), to the part Number

Material Table #1

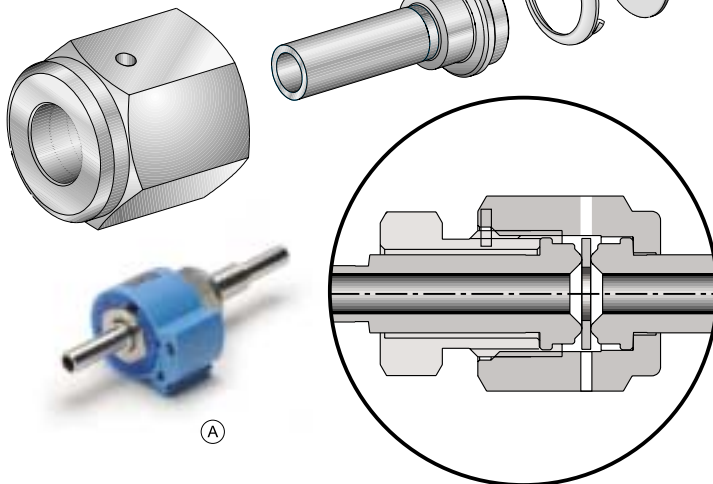
	MATERIAL	ORDERING DESIGNATOR	REFERENCE SPECIFICATIONS	LEVEL	*Ra MAX/ Ra Average µinch
GLANDS	316L VIM/VAR	V	Semi F20, ASTM A276	E	10 / 5
	316L VIM/VAR Low Mn	LM	JIS G 4303 SUS316L		
	316L VOD	P	ASTM A276, A479		
	316L	P	Barstock, ASTM A276		
	MONEL 400/450	M	ASTM -B-164, MIL-N-24106		
	HASTELLOY C276	H	ASME SB-574		
MINI BUTTWELD	316L VIM/VAR	V	Semi F20, ASTM A276	E	10 / 5
	316L VIM/VAR Low Mn	LM	Forgings, ASTM A182		
AW BODIES	316L VOD	P	ASTM A276, A479	E	10 / 5
FACE SEAL FITTINGS	316L VOD	P	ASTM A276, A479	E	10 / 5
	316L				
NUTS, CAPS, PLUGS	316	P	Barstock, ASTM A276	N/A	N/A
GASKETS	NICKEL 270	Ni	ASTM B-162	E.P. ONLY	5 / 3
	316L	SS	ASTM A240, A167	E.P. ONLY	5 / 3

Surface finish Reference: ANSI/ASME B 46.1 and ISO 4288

* For "H" level the surface roughness Ra average - 10 µinch

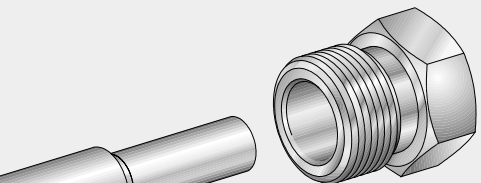
MAKE UP OF GLANDS

- Glands offer high purity metal to metal seal, for leak free service in high vacuum or high pressure assemblies.
- The Gasket is compressed by two highly polished beads when the male and female nuts are engaged.
- The gland's bead to bead assembly compresses a soft metal gasket to seal. This assembly can be locked by Ham-Let's Grip-Kit Ⓢ.



- Visual test and leak testing is performed through two test ports in opposite locations of the female nut.

ASSEMBLY INSTRUCTIONS:



1. All HTC face seal fittings should be protected until assembly and make up. Exercise great care that the sealing surfaces are not scratched, damaged or contaminated in any way during handling and assembly.
2. High purity fittings/applications dictate make up and assembly in clean environment utilizing proper clean room protocol.
3. Make up instructions:
Tighten the female nut to the male nut/body finger tight.
Tighten the female nut 1/8 turn past finger tight. Always torque the female nut while keeping the male nut/body stationary.
Face seal connections are remarkable - please use a new gasket for each remarke.

HAM-LET MONEL[®] NICKEL-COPPER ALLOY 400/R-405 CONNECTORS



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Special Metals Corp.














MONEL® NICKEL-COPPER ALLOY 400/R-405 **LET-LOK TUBE FITTINGS**

ALLOY 400/R-405 CONNECTORS






Monel® nickel-copper alloy 400 is a solid-solution alloy that can be hardened only by cold working. It has high strength and endurance over a wide temperature range and excellent resistance to many corrosive environments. Alloy 400 is widely used in many fields, especially marine and chemical processing.

MONEL® MATERIAL STD	
Barstock	Forging
ASTM B 164	ASTM B 564

<p>760LB - Back Ferrule*</p>  <table border="1"> <thead> <tr> <th>Ordering Info.</th> <th>Tube O.D. in</th> </tr> </thead> <tbody> <tr> <td>760LB M 1/4</td> <td>1/4</td> </tr> <tr> <td>760LB M 3/8</td> <td>3/8</td> </tr> <tr> <td>760LB M 1/2</td> <td>1/2</td> </tr> </tbody> </table>	Ordering Info.	Tube O.D. in	760LB M 1/4	1/4	760LB M 3/8	3/8	760LB M 1/2	1/2	<p>760LF - Front Ferrule*</p>  <table border="1"> <thead> <tr> <th>Ordering Info.</th> <th>Tube O.D. in</th> </tr> </thead> <tbody> <tr> <td>760LF M 1/4</td> <td>1/4</td> </tr> <tr> <td>760LF M 3/8</td> <td>3/8</td> </tr> <tr> <td>760LF M 1/2</td> <td>1/2</td> </tr> </tbody> </table>	Ordering Info.	Tube O.D. in	760LF M 1/4	1/4	760LF M 3/8	3/8	760LF M 1/2	1/2	<p>761L - Nut</p>  <table border="1"> <thead> <tr> <th>Ordering Info.</th> <th>Tube O.D. in</th> </tr> </thead> <tbody> <tr> <td>761L M 1/4</td> <td>1/4</td> </tr> <tr> <td>761L M 3/8</td> <td>3/8</td> </tr> <tr> <td>761L M 1/2</td> <td>1/2</td> </tr> </tbody> </table>	Ordering Info.	Tube O.D. in	761L M 1/4	1/4	761L M 3/8	3/8	761L M 1/2	1/2	<p>762L - Union</p>  <table border="1"> <thead> <tr> <th>Ordering Info.</th> <th>Tube O.D. in</th> </tr> </thead> <tbody> <tr> <td>762L M 1/4</td> <td>1/4</td> </tr> <tr> <td>762L M 3/8</td> <td>3/8</td> </tr> <tr> <td>762L M 1/2</td> <td>1/2</td> </tr> </tbody> </table>	Ordering Info.	Tube O.D. in	762L M 1/4	1/4	762L M 3/8	3/8	762L M 1/2	1/2													
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* All LET-LOK ferrules are available as sets.

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769L - Male Elbow  <table border="1"> <thead> <tr> <th>Ordering Info.</th> <th>Tube O.D. in</th> <th>Male pipe size in</th> </tr> </thead> <tbody> <tr> <td>769L M 1/4 x 1/4</td> <td>1/4</td> <td>1/4</td> </tr> <tr> <td>769L M 3/8 x 1/4</td> <td>3/8</td> <td>1/4</td> </tr> <tr> <td>769L M 1/2 x 1/2</td> <td>1/2</td> <td>1/2</td> </tr> </tbody> </table>				Ordering Info.	Tube O.D. in	Male pipe size in	769L M 1/4 x 1/4	1/4	1/4	769L M 3/8 x 1/4	3/8	1/4	769L M 1/2 x 1/2	1/2	1/2	766L - Female Connector  <table border="1"> <thead> <tr> <th>Ordering Info.</th> <th>Tube O.D. in</th> <th>Female pipe size in</th> </tr> </thead> <tbody> <tr> <td>766L M 1/4 x 1/4</td> <td>1/4</td> <td>1/4</td> </tr> <tr> <td>766L M 3/8 x 1/4</td> <td>3/8</td> <td>1/4</td> </tr> </tbody> </table>				Ordering Info.	Tube O.D. in	Female pipe size in	766L M 1/4 x 1/4	1/4	1/4	766L M 3/8 x 1/4	3/8	1/4																																							
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