

Weld nipples are assured by an O-ring sealing for a leakfree performance

Weld nipples match to all fittings of the wide range.

Introduction

Weld nipple have been introduction to the market in the late 60's these were are traditionally used for heavy duty application such as hydraulic presses, mining, steel mills and shipbuilding.

Function of the Weld Nipple HYDROMAX Fittings range allows welded tube Connections.

Therefore, the weld-nipple has to be welded onto the tube end. Using the standard nut, this weld nipple can then be connected to the tube joint of any tube fittings. Weld-nipple is available for L and S - series tubes of 6-38/42 mm diameter. A broad range of weld nipple fittings including reducers or elbows covers most applications. The use of weld nipples allows remarkable pipe systems based on rigid weld connections.

Features, Advantages & Benefits of the weld nipple.

Weld nipple feature most advantages of the attractive fitting program. The specific of the weld nipple program are:

1. Low quality tube

Unlike bite-type or flared fittings, dimensional tolerances and rough tube are not very critical. Therefore weld nipples are suitable for countries where only poor quality tube is available.

2. No Phantom leaks

Lubrication is not mandatory for the assembly of weld nipples. The machine operator will not be irritated about lubricant coming out of the fittings once the hydraulic system gets hot.

3. Sealing capability

An elastomeric seal forms the primary sealing element, thus assuring leak free sealing. Even low-viscosity media such as water or gas are hermetically sealed. Hydraulic systems therefore do not "sweat" at fittings.

4. Durability

The O-ring seal is assembled with a high initial compression. It does not require any retightening even after years of operation under severe working conditions.

5. Failure mode

Unlike bite type fittings there is little danger of tube blow off if the fitting is not properly tightened. A loose joint shows excessive leakage before total failure.

6. Reusability/Remake ability

Weld nipples can be disassembled and reassemble many times. There is no wear or widening up of vulnerable inner fitting cone. Damaged O-ring can easily be replaced.

7. Smooth Edge

Under severe working conditions, weld nipple are most likely to crack at the dimensional step just under the nut. In an additional rolling process this critical edge is smoothed for increased vibration strength.

8. Stress-free

by welding, little deviations on to be cutting or bending can be compensated. Tension-free pipe work is not likely to break even under severe working conditions.

9. Welding process

Weld nipples are designed to be used for most popular welding processes.



Design Criteria

Technical Data

Basic system design requires determining the following information:

1. Type of fluid used in the sytem.
2. Corrosive nature of service environment.
3. Operating temperature range.
4. Type of line: pressure, return or suction.
5. Maximum operating pressure, for pressure and return lines.
6. Maximum flow rate.
7. Severity of service: normal, severe, or hazardous.
8. Routing or space restrictions.

System parameter known.....is used to determinewhich can be found in Section.....
Type of fluid used in the system	Fluid compatibility Tube material Fitting and seal material.	Fluid compatibility Tube specifications material.
Corrosive nature of service environment	Plating type Fitting and seal material Tube material	Surface treatment Materials Tube specifications
Operating temperature	Tube and fitting material selection Seal material	Temperature Temperature
Type of line : pressure, for pressure and return lines	Fitting type Fitting series Tube size Tube wall thickness	Tube end selection LL/L/S Series Selection Flow diameter Recommended Design Pr. for Tubes
Maximum operating pressure, return or suction	Fitting type Fitting series male stud design Orientable fittig type Pressure Rating Tube wall thickness	Tube end selection LL/L/S Series Selection Port end selection Orientable fitting selection Pressure Rating Recommended Design Pr. for Tubes
Maximum flow rate	Tube size Pressure drop through fittings Orientation fitting type	Flow diameter Flow Characteristics Orientable Fitting selection
Severity of service: normal, servere, or hazardous	Fitting type Fitting series Male stud design	Type end selection LL/L/S Series Selection Port end selection
Routing for space restrictions	Fitting and tube envelope Fitting series Orientable Fitting type	Fitting Envelope Dimentions LL/L/S Series Selection Orientable Fitting selection



Tube end selection

Technical Data

Type	Ferrule Type	Weld Nipple Type
Sealing method	Metal seal	Elastomeric seal(O-ring)
International Standard	ISO 8434-1	ISO 8434-1
National Standard	DIN 2353 DIN 3861	DIN 2353 DIN 3861
Tube compatibility	Metal and plastic tube (steel, stainless steel, copper aluminum, polyamide.....)	Weldable steel and stainless steel
Available sizes	4LL - 12LL 6L - 42L 6S - 38S	6L - 42L 6S - 38S
Performance seal reliability	Very good	Excellent
Assembly tube preparation	good	Excellent
Installation	good	Excellent
Field repair	Very good	Difficult
Typical applications	General use in hydraulic, pneumatic, lubrication and coupling systems	Limited use for special application
	Agricultural equipment Process engineering	Heavy machinery Ship building Power plants
Current use	Most popular fitting for metric tube Traditional bite type fitting	Limited use in Northern Europe and Asia

LL/L/S Series selection

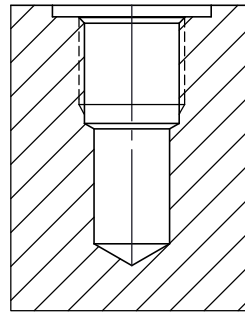
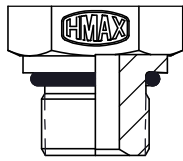
	LL	L	S
Design	very Light	Light	Heavy
Performance Pn (bar) Pmax (bar) Suitability for heavy duty application	100 250 Good	160-315 250-500	315-630 420-900
Tube dimension	4,6,8,10,12	6,8,10,12,15,18,22,28,35,42	6,8,10,12,14,16,20,25,30,38
Assembly Tightening effort Space requirement	Very low Very low	Normal Low	High High
Typical applications	Central lubrication Airbreed systems Fuel lines Oil/gas stoves Micro hydraulics	Machine tools Agricultural Vehicles	hydraulic presses plastic injection molding steel mills shipbuildings mobile construction equipment
Conclusion	Very light design for space limited assemblies in low to medium pressure applications	Medium to high pressure fitting for general use in hydraulic and pneumatic systems	Rigid design for use in heavy-duty applications



Port end selection

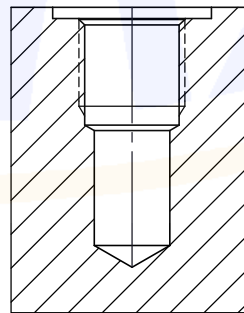
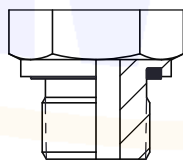
Technical Data

Port end selection: Male studs with Male studs with 'O'ring seal



Port Description	Male studs with 'O'ring sealing	
Thread	Metric	UN/UNF Threads
Thread standard (example)	M16x1.5 ISO261;ISO724;DIN13-T5-T7	3/4-16 UNF ISO725 / ANSI B1.1-1974
Male stud standard	DIN3852 T3,type F ISO 6149-2/3	ISO 11926-2/3
Port tapping standard	DIN3852 T3,type W ISO 6149-1	ISO 11926-1
Performance characteristics - pressure capacity - sealing characteristics - additional sealant required	Very high Very good no	Very high Very good no
Current use	New safe sealing system for all areas of application, especially suitable for high pressure hydraulics. Standard sealing for the future	Predecessor of metric sealing system. Often used in USA.

Port end selection: Male studs with Elastomeric seal



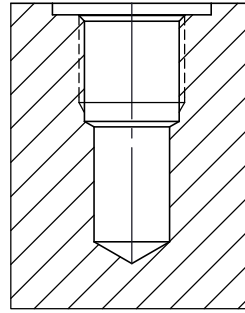
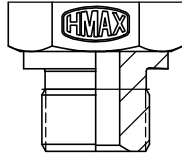
Port Description	Male studs with Elastomeric sealing	
Thread	BSP	Metric
Thread standard (example)	G1/4A DIN/ISO 228-T1	M16x1.5 ISO261;ISO724;DIN13-T5-T7
Male stud standard	DIN3852 T11,type E ISO 1179-2	DIN3852 T11,type E ISO 9974-2
Port tapping standard	DIN3852 T2,type X,Y ISO 1179-1	DIN3852 T1,type X,Y ISO 9974-1
Performance characteristics - pressure capacity - sealing characteristics - additional sealant required	Very high Very good no	Very high Very good no
Current use	Solid, soft sealing male studs. Know worldwide. Well suitable for soften counter material (e.g housing of Al-alloy). Well suitable for usings with gas	Solid, soft sealing male studs. Know worldwide. Well suitable for soften counter material (e.g housing of Al-alloy). Well suitable for usings with gas



Port end selection

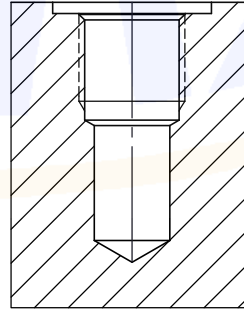
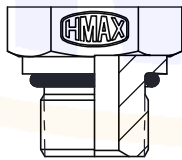
Technical Data

Port end selection: Male studs with sealing by cutting face



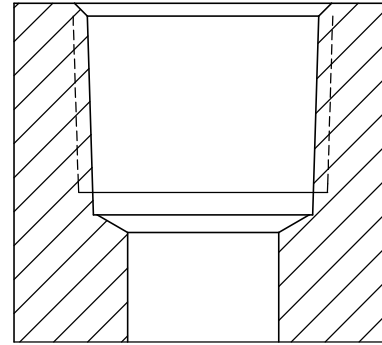
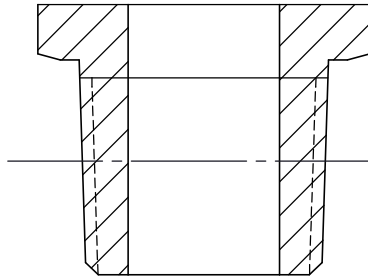
Port Description	Male studs with 'O'ring sealing	
Thread	Metric	UN/UNF Threads
Thread standard (example)	M16x1.5 ISO261;ISO724;DIN13-T5-T7	3/4-16 UNF ISO725 / ANSI B1.1-1974
Male stud standard	DIN3852 T3,type F ISO 6149-2/3	ISO 11926-2/3
Port tapping standard	DIN3852 T3,type W ISO 6149-1	ISO 11926-1
Performance characteristics - pressure capacity - sealing characteristics - additional sealant required	Very high Very good no	Very high Very good no
Current use	New safe sealing system for all areas of application, especially suitable for high pressure hydraulics. Standard sealling for the future	Predecessor of metric sealing system. Often used in USA.

Port end selection: Male studs with Elastomeric seal



Port Description	Male studs with Elastomeric sealing	
Thread	BSP	Metric
Thread standard (example)	G1/4A DIN/ISO 228-T1	M16x1.5 ISO261;ISO724;DIN13-T5-T7
Male stud standard	DIN3852 T11,type E ISO 1179-2	DIN3852 T11,type E ISO 9974-2
Port tapping standard	DIN3852 T2,type X,Y ISO 1179-1	DIN3852 T1,type X,Y ISO 9974-1
Performance characteristics - pressure capacity - sealing characteristics - additional sealant required	Very high Very good no	Very high Very good no
Current use	Solid, soft sealing male studs. Know worldwide. Well suitable for soften counter material (e.g housing of Al-alloy). Well suitable for usings with gas	Solid, soft sealing male studs. Know worldwide. Well suitable for soften counter material (e.g housing of Al-alloy). Well suitable for usings with gas

Male studs with sealing by taper thread



Port Description	Male studs with 'O' ring sealing		
	BSP	Metric	NPT
Thread			
Thread standard	R1/4 DIN 3858	M 10 x 1 DIN 158	1/4-18 NPT ANSI/ASME B1.20.1-1983
Further standard	GB: 1/4 BSPT Japan: 1/4 BSPT	--	--
Male Studs	DIN 3852 T2, type C	DIN 3852 T2, type C	--
Port Tapping	DIN 3852 T2, type Z	DIN 3852 T2, type Z	--
Performance characteristics -Pressure capacity -Sealing characteristics -Jointing solution required	low medium yes	low medium yes	low medium yes
Current use	Only for low requirements, because port tapping is a parallel thread. Sealing only achieved with fluid or plastic sealing material	Only for low requirements, because port tapping is a parallel thread. Sealing only achieved with fluid or plastic sealing material	US taper pipe thread. Male studs and port tapping are tapered. Sealing only achieved with fluid or plastic sealing material.



Material selection: Sealing material

Technical Data

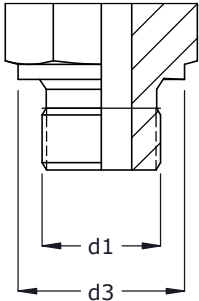
Tube Material: Fitting material:	Steel Steel	Stainless Steel Stainless Steel	Stainless Steel Steel
Performance Characteristics:			
Pressure Capability	Excellent	Excellent	Good
External temperature Capacity	Very Good	Excellent	Very Good
Corrosion resistance	Good	Very Good	Good
Internal media compatibility	Good	Excellent	Good
Assembly Characteristics:			
Ferrule	Excellent	Preassembly	Preassembly with Stainless steel ferrule
Weldable Nipple	Excellent	Excellent	Special functional Nut, required not possible
Typical Application	Machine tools, mobile construction equipment	Shipbuilding, Offshore exploration, Process engineering Paper machines	Some airbrake systems in railway industry wet machinig area on machine tools
Current use	Standard material combination for genaral use in hydraulic or application system	Standard material combination for use with aggressive media environment in corrosive	Special material combination for slightly corrosive

Sealing technology	Metal - to - metal	Nitrile rubber (NBR)
Performance Characteristics:		
High Pressure Capability	Good	Excellent
Low temperature Capacity	Excellent	Very Good
High temperature Capacity	Excellent	Good
Media compatibility	Excellent	Good
Long term reliability	Good	Excellent
Assembly Characteristics:		
Ease of initial assembly	Good	Excellent
Repeated assembly	Good	Excellent
Replacement of seal	Not possible	Easy
Typical applications	Process engineering Agricultural Equipment Mobile construction	Machine tools Hydraulic presses equipment
Current use	Suitable for aggressive media respectively for very low or very high temperatures	General use in - Hydraulic - Pneumatic - Lubrication - Air breake systems

Metric thread according to DIN 3852 part 1 and part 11; ISO 9974-1, 2 and 3
 BSPP/BSPT thread according to DIN 3852 part 2 and part 11; ISO 1179-1, 2, 3 and 4

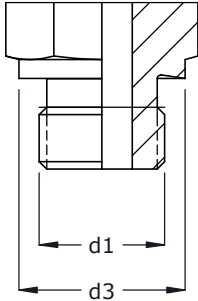
**Male stud
Type A**

Sealing:
Sealing washer
DIN 7603



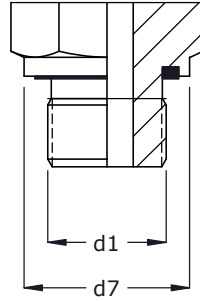
**Male stud
Type B**

Sealing:
Cutting face



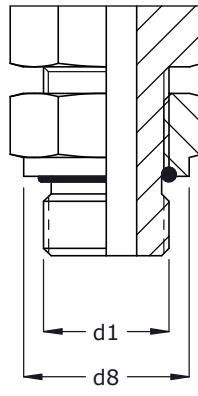
**Male stud
Type E**

Sealing: Elastomeric
seal ED



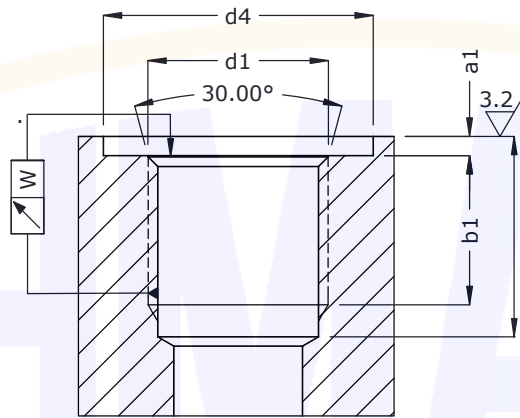
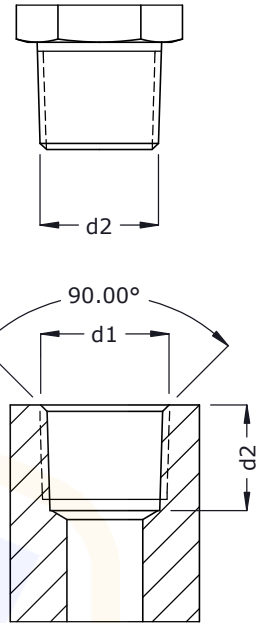
**Male stud
adjustable Type F**

Sealing: 'O' ring



**Male stud
Type C**

Sealing: Taper thread



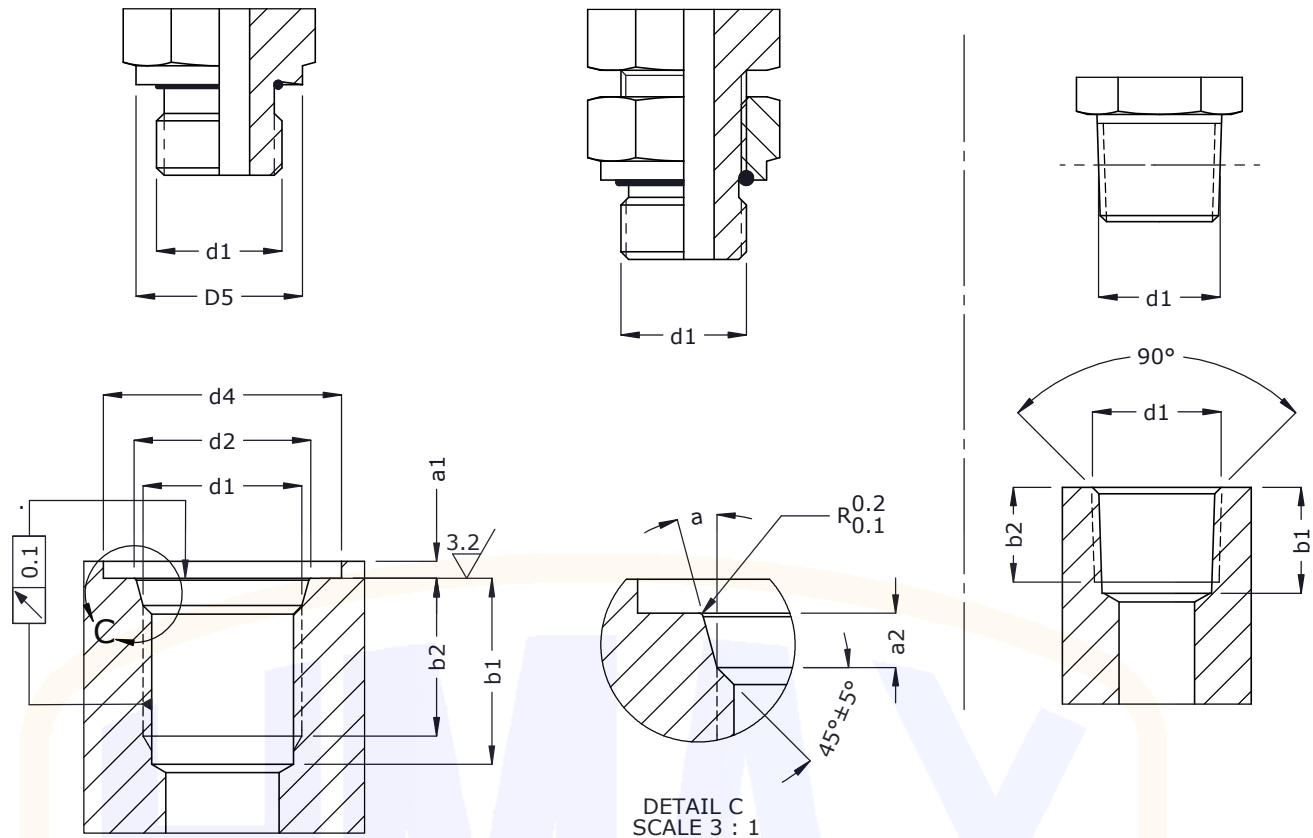
Port Type 'x'
(For parallel studs)

Port Type 'z'
(For tapered studs) 1)

Thread d ₁	d ₃	d ₇	d ₈	d ₄ min small	d ₄ 0.4 wide	a ₁ max	b ₁ min	Thread d ₂	b ₂ min	W	Identification	
											Thread outer diameter	Thread inner diameter
M 8x1								M 8x1 tap	5.5	0.1	8.00	6.92
M 10x1	14	13.9	14.8	15	20	1.0	8	M 10x1 tap	5.5	0.1	10.00	8.92
M 12x1.5	17	16.9	17.8	18	25	1.5	12	M 12x1.5 tap	8.5	0.1	12.00	10.38
M 14x1.5	19	18.9	19.8	20	25	1.5	12	M 14x1.5 tap	8.5	0.1	14.00	12.38
M 16x1.5	21	21.9	22.8	23	28	1.5	12	M 16x1.5 tap	8.5	0.1	16.00	14.38
M 18x1.5	23	23.9	24.8	25	20	2.0	12	M 18x1.5 tap	8.5	0.1	18.00	16.38
M 20x1.5	25	25.9	26.8	27	34	2.0	14	M 20x1.5 tap	10.5	0.1	20.00	18.38
M 22x1.5	27	26.9	27.8	28	34	2.5	14	M 22x1.5 tap	10.5	0.1	22.00	20.38
M 26x1.5	31	31.9	32.8	33	42	2.5	16	-	-	0.2	26.00	24.38
M 27x2.0	32	31.9	32.8	33	42	2.5	16	-	-	0.2	27.00	24.84
M 33x2.0	39	39.9	40.8	41	47	2.5	18	-	-	0.2	33.00	30.84
M 42x2.0	49	49.9	50.8	51	58	2.5	20	-	-	0.2	42.00	39.84
M 48x2.0	55	54.9	55.8	56	65	2.5	22	-	-	0.2	48.00	45.84
G 1/8 A	14	13.9	14.8	15	19	1.0	8	R 1/8 tap	5.5	0.1	9.73	8.57
G 1/4 A	18	18.9	19.8	20	25	1.5	12	R 1/4 tap	8.5	0.1	13.16	11.45
G 3/8 A	22	21.9	22.8	23	28	2.0	12	R 3/8 tap	8.5	0.1	16.66	14.95
G 1/2 A	26	26.9	27.8	28	34	2.5	14	R 1/2 tap	10.5	0.1	20.96	18.63
G 3/4 A	32	31.9	32.8	33	42	2.5	16	-	-	0.2	26.44	24.12
G 1 A	39	39.9	40.8	41	47	2.5	18	-	-	0.2	33.25	30.29
G 1 1/4 A	49	49.9	50.8	51	58	2.5	20	-	-	0.2	41.91	38.95
G 1 1/2 A	55	54.9	55.8	56	65	2.5	22	-	-	0.2	47.80	44.85

1) Tightness can only be achieved by liquid or plastic sealing aids

Metric, UNF/UN, NPT thread, corresponding ANSI/ASME B1.20.1-1983



Thread	d ₁	D ₅	d ₄ min	d ₂ +0.1	a ₁ max	a ₂ ±0.4	b ₁ min	b ₂ min	a +1°	Identification	
										Thread outer diameter	Thread inner diameter
M 8x1		11.8	14	9.10	1.0	1.6	11.5	10.0	12°	8.00	6.92
M 10x1		13.8	16	11.10	1.0	1.6	11.5	10.0	12°	10.00	8.92
M 12x1.5		16.8	19	13.80	1.5	2.4	14.0	11.5	15°	12.00	10.38
M 14x1.5		18.8	21	15.80	1.5	2.4	14.0	11.5	15°	14.00	12.38
M 16x1.5		21.8	24	17.80	1.5	2.4	15.5	13.0	15°	16.00	14.38
M 18x1.5		23.8	26	19.80	2.0	2.4	17.0	14.5	15°	18.00	16.38
M 22x1.5		26.8	29	23.80	2.0	2.4	18.0	15.5	15°	22.00	20.38
M 27x2.0		31.8	34	29.40	2.0	3.1	22.0	19.0	15°	27.00	24.84
M 33x2.0		40.8	43	35.40	2.5	3.1	22.0	19.0	15°	33.00	30.84
M 42x2.0		49.8	52	44.40	2.5	3.1	22.5	19.5	15°	42.00	39.84
M 48x2.0		54.8	57	50.40	2.5	3.1	25.0	22.0	15°	48.00	45.84
7/16-20 UNF-2B		13.8	21	12.40	1.6	2.4	14.0	11.5	12°	11.11	9.74
9/16-18 UNF-2B		16.8	25	15.65	1.6	2.5	15.5	12.7	12°	14.29	12.76
3/4-16 UNF-2B		21.8	30	20.60	2.4	2.5	17.5	14.3	15°	19.05	17.33
7/8-14 UNF-2B		26.8	34	23.95	2.4	2.5	20.0	16.7	15°	22.23	20.26
11/16-12 UN-2B		31.8	41	29.15	2.4	3.3	23.0	19.0	15°	26.99	24.69
15/16-12 UN-2B		40.8	49	35.50	3.2	3.3	23.0	19.0	15°	33.34	31.04
15/8-12 UN-2B		49.8	58	43.50	3.2	3.3	23.0	19.0	15°	41.28	38.99
17/8-12 UN-2B		54.8	65	49.85	3.2	3.3	23.0	19.0	15°	47.63	45.33
1/8-27 NPT							11.6	6.9			
1/4-18 NPT							16.4	10.0			
3/8-18 NPT							17.4	10.3			
1/2-14 NPT							22.6	13.6			
3/4-14 NPT							23.1	14.1			
1-1 1/2 NPT							27.8	16.8			
1 1/4-1 1/2 NPT							28.3	17.3			
1 1/2-1 1/2 NPT							28.3	17.3			

1) Tightness can only be achieved by liquid or plastic sealing aids

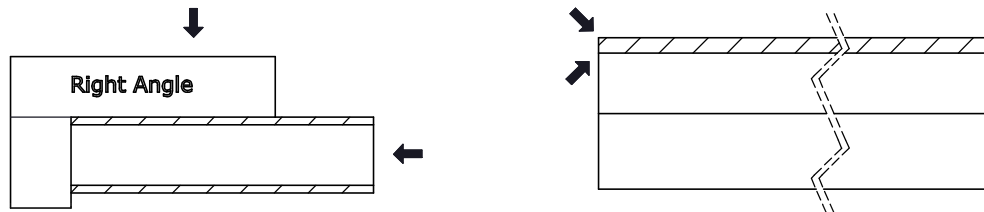
Assembly Instruction:

For proper assembly following assembly instruction shall be followed. Improper assembly may lead to malfunctions or impair safety.

Assembly in fittings body

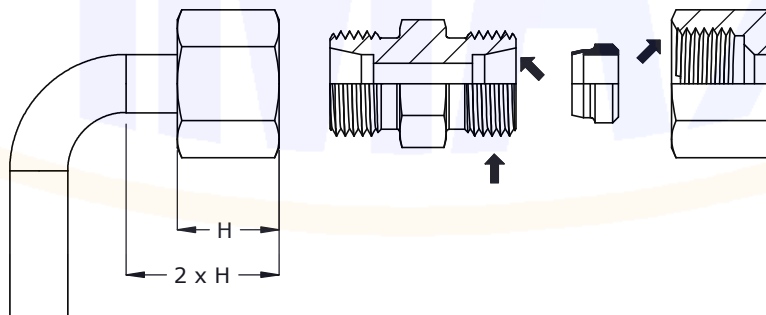
Preparation of Tube & Fitting Parts

- 1] Saw off tube square.
1/2° angle tolerance to the tube axis is permissible. Tube cutter is not recommendable



- 2] Lightly remove chips and particles from the inside and outside cut edges of tube. Bevel up to 0.2mm x 45° is permissible.

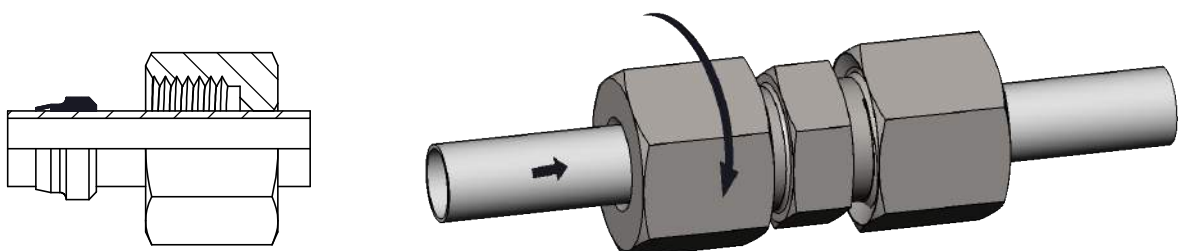
- 3] For tube bend, the minimum height from the straight pipe end to the bending radius must be at least twice the height of the nut.



- 4] Lubricate thread and cone of the fitting body, ring and thread of nut.

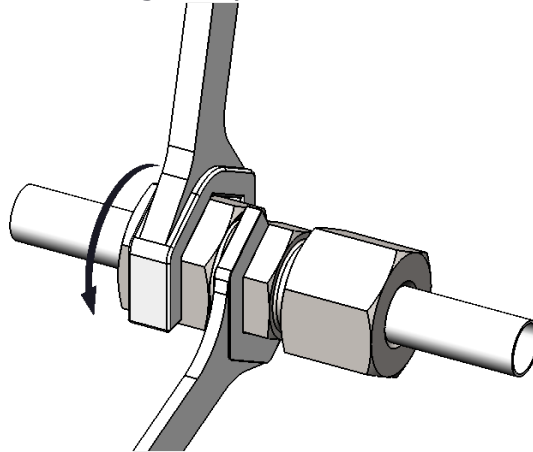
Assembly

- 5] Slip nut and then ring onto the tube end. Ensure that the ring is placed correctly.



- 6] Screw nut manually on to fitting body unit finger tight. Hold the tube against the shoulder in the cone of the fitting body.

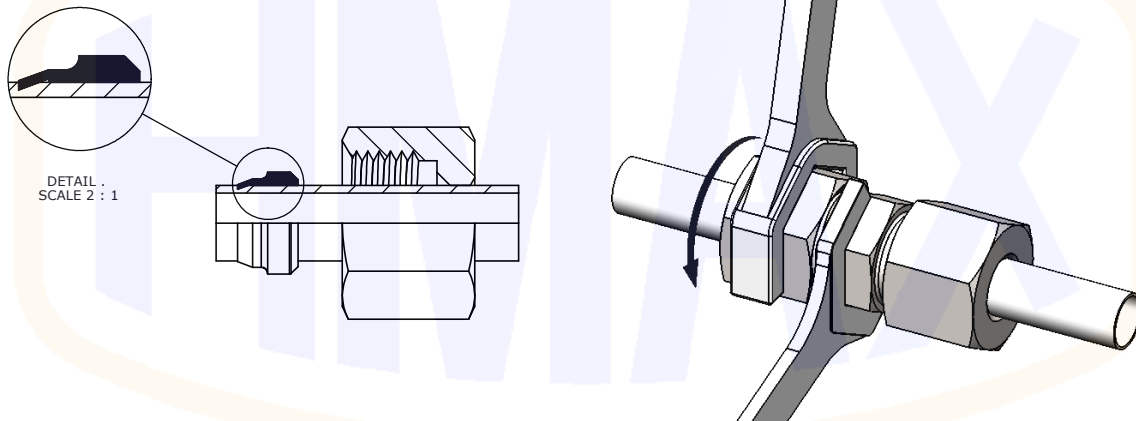
7] Mark nut and tube for measuring the prescribed turns of the nut.



8] Tighten the nut 1 1/2 turns. Tube must not turn with tube. Stop edge of the ring limits overtightening by increasing tightening torque.

Check & Final Assembly

9] Loosen nut and remove ring-mounted tube from fitting. And check if a visible collar has formed on the pipe in front of the first cutting edge. If not, tighten slightly more.



9] Insert the pre-assembled tube into the fitting. While holding fitting body with a wrench, tighten nut approx. 1/2 revolution beyond the point of a clearly perceptible resistance



Tightening Torques for Stud (TTS)

Technical Data

Tightening Torques for Stud (TTS)

- Recommend tightening torques MA
the table below shows the Nm value for studs with metal seal, from B. DIN 3852 or with captive sealing (ED-Ring) to avoid leakings.
- Sealing of taper thread
Taper threads are not self-sealling. To achieve a leakproof seals, an additionnal sealant is necessary. A well-established sealing-medium is a PTFE-tape (e.g.Teflon)
- Note :
The quoted figures relate to fittings out of steel(galvanized) and to counter parts made of steel.
()* These figured relate to studs with captive sealing ED-Ring. For the Male/Female adapters . there apply the tightening torques for series "S"

Series	Tube O,D	Pipe Thread	MA (Nm)	Metric Thread ISO	MA (Nm)
L	6	G 1/8A	25	M10x1	25
	8	G 1/4A	50	M12x1.5	30
	10	G 1/4A	50	M14x1.5	50
	12	G 3/8A	80	M16x1.5	80
	15	G 1/2A	160	M18x1.5	90
	18	G 1/2A	105	M22x1.5	160
	22	G 3/4A	220	M26x1.5	285
	28	G 1 A	370	M33x2.0	425
	35	G 1 1/4A	600	M42x2.0	600
	42	G 1 1/2A	800	M48x2.0	800
S	6	G 1/4A	60	M12x1.5	35
	8	G 1/4A	60	M14x1.5	60
	10	G 3/8A	110	M16x1.5	95
	12	G 3/8A	110	M18x1.5	120
	14	G 1/2A	170	M20x1.5	170
	16	G 1/2A	140	M22x1.5	190
	20	G 3/4A	320	M27x2.0	320
			(250)*		(250)*
	25	G 1 A	380	M33x2.0	500
	30	G 1 1/4A	600	M42x2.0	600
38	G 1 1/2A	800	M48x2.0	800	