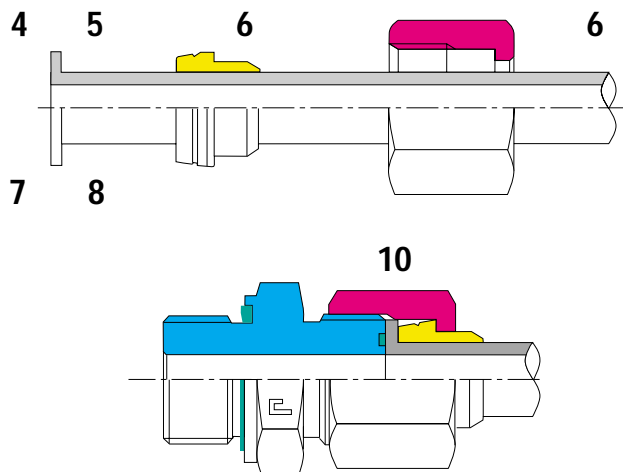
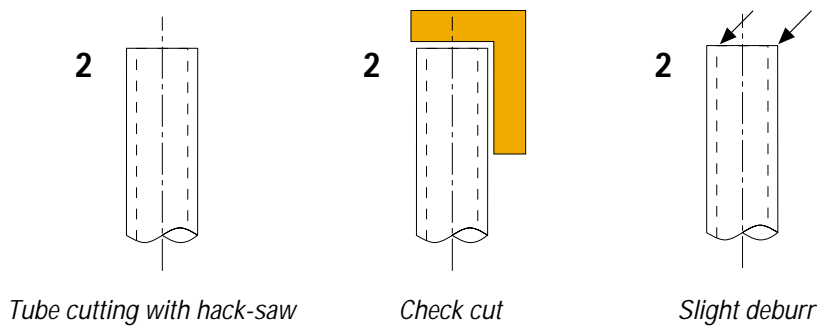


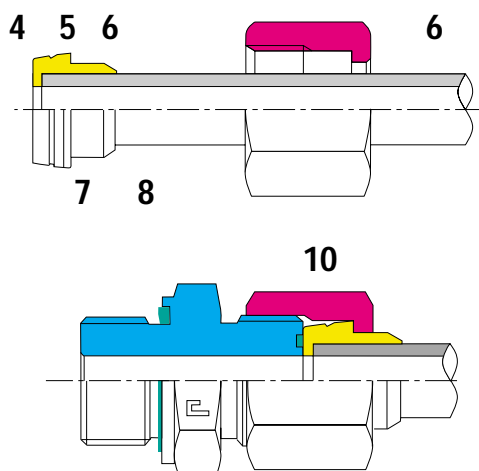
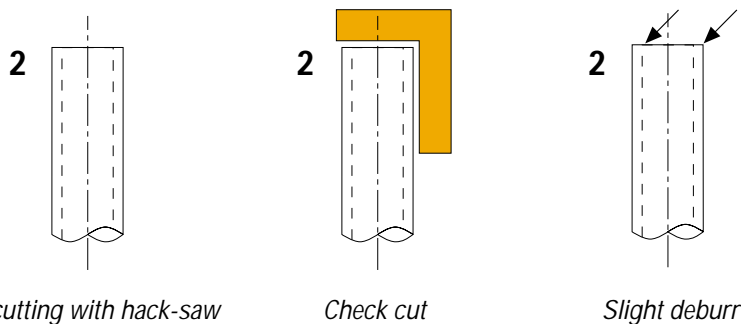
ASSEMBLY INSTRUCTIONS ACCORDING TO SAE J1453 FOR FLARED TUBES

1. Before to start to flare the tube check for the correct parameters of all the tools to be used and substitute those not complying to the requirements.
2. Cut the tube at a 90° angle using the appropriate tool (do not use roll tube cutters). Check for the correct cut of the tube and deburr internally and externally.
3. To obtain the wanted length of the tube please add the "L1" quote on the technical information datas for tube flaring on page 28.
4. Check for any damage that could impair the usefulness of the fitting, on the internal part of the tube. Never use a non complying tube.
5. Clean properly with appropriate products the part of the tube to be flared.
6. Assemble the nut and sleeve on the tube taking care that the open part of the nut is directed the same way where the tube shall be flared so as must be the head of the sleeve, see below.
7. Flare the tube using the appropriate flaring machine, and carefully respecting all the indications in the below table. The drawings indicate the quotes that must be considered.
8. Check that the flaring of the tube has been made correctly and that no structural damages that could impair the correct working of the tube are present.
9. Clean nut, sleeve, fitting and tube and lubricate with suggested products.
10. Couple the flared tube on the fitting cone, and tighten by hand the nut on the body of the fitting to check the correct alignment of the parts involved, then using a wrench tighten until reaching the metal to metal contact of the conical parts.
11. Repeated assembly and disassembly will not alter the functionality of the products.
12. Please refer to the table on page 25 for the correct tightening torques to be applied.



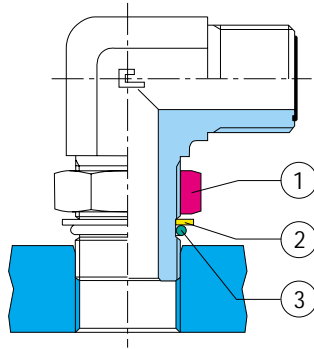
ASSEMBLY INSTRUCTIONS ACCORDING TO SAE J1453 FOR BRAZED TUBES

1. Before to start to braze the tube check for the correct parameters of all the tools to be used and substitute those not complying to the requirements.
2. Cut the tube at a 90° angle using the appropriate tool (do not use roll tube cutters). Check for the correct cut of the tube and deburr internally and externally.
3. To obtain the wanted length of the tube please add the "L1" quote on the technical information datas for tube brazing on page 28.
4. Check for any damage that could impair the usefulness of the fitting, on the internal part of the tube. Never use a non complying tube.
5. Clean properly with appropriate products the part of the tube to be brazed.
6. Assemble the nut and sleeve on the tube taking care that the open part of the nut is directed the same way where the tube shall be brazed so as must be the head of the sleeve, see below.
7. Braze the tube using appropriate brazing tools, ensuring that the tube is correctly in contact in the inside part of the sleeve, and making sure not to overheat or carbonise the components.
8. Check that the brazing of the tube has been made correctly and that no structural damages that could impair the correct working of the tube are present.
9. Clean nut, sleeve, fitting and tube and lubricate with suggested products.
10. Couple the brazed tube on the fitting cone, and tighten by hand the nut on the body of the fitting to check the correct alignment of the parts involved, then using a wrench tighten until reaching the metal to metal contact of the conical parts.
11. Repeated assembly and disassembly will not alter the functionality of the products.
12. Please refer to the table on page 25 for the correct tightening torques to be applied.



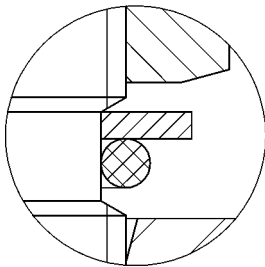
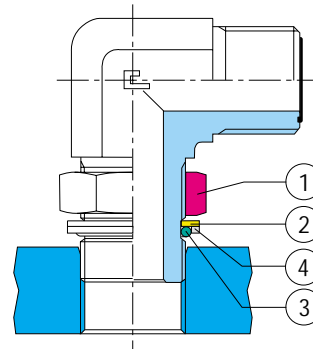
ASSEMBLY INSTRUCTIONS FOR ADJUSTABLE FITTINGS

ISO 6149 Metric thread
ISO 11926 UNF/UN-2A thread

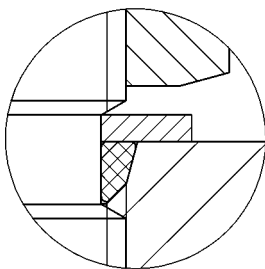
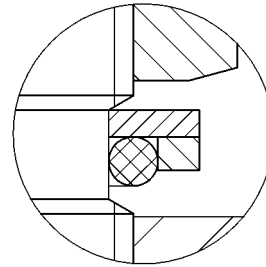


- 1 Back up hexagonal nut
- 2 Back up sleeve
- 3 O-ring
- 4 Retaining ring

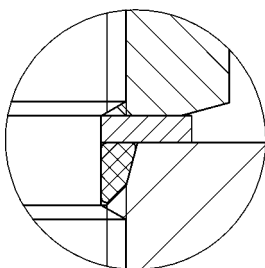
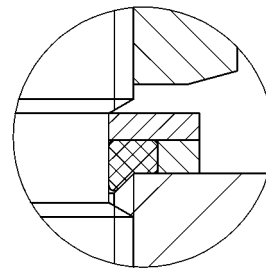
BSPP Thread (In revision phase)
ISO 6149 Metric thread with retaining ring



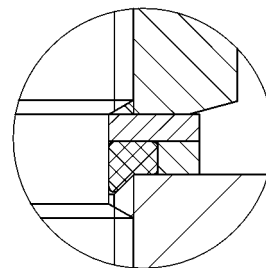
Lubricate the o-ring.
Unscrew the back up hexagonal nut and check that the back up sleeve is positioned as in the side picture.
The correct position of the back up sleeve may be obtained when the fitting is screwed into the female thread.



Lubricate the o-ring.
Screw the fitting in to the point that the back up sleeve is in contact with the base of the female checking that the o-ring is positioned correctly into its shaped housing.

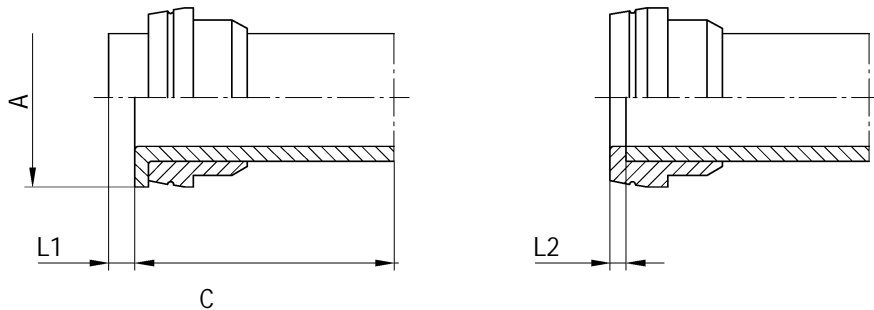


Unscrew the fitting up to a maximum of 1 turn to obtain the desired positioning.
Keep the fitting still with a wrench and block the back up hexagonal nut.
Please refer to the related tables for the correct tightening torques to be applied.



N.B. To obtain the ISO 6149 type of sealing please take out the retaining ring from the standard fitting.

TECHNICAL DATAS FOR TUBE PREPARATION

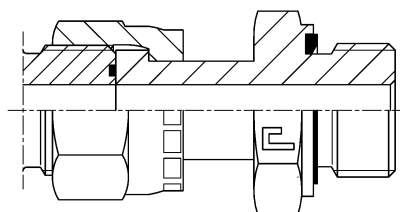


Ø Metric Tube	Ø Inch Tube	Flaring Ø		L1	L2	C
		A min	A max			
6x1	1/4x0,035	12.10	12.75	-	1	32
6x1,5	1/4x0,065			-		
8x1	5/16x0,035	14.85	15.75	-	1	40
8x1,5	5/16x0,065			-		
10x1	3/8x0,035			2,5		
10x1,5	3/8x0,065			2		
10x2	3/8x0,083			1,5		
12x1	1/2x0,035	18	18.90	-	1	45
12x1,5	1/2x0,065			3		
12x2	1/2x0,083			2,5		
12x2,5	1/2x0,095			2		
14x1,5	-			-		
14x2	-	-				
14x2,5	-	-				
15x1,5	-	22.20	23.45	4,5	1,5	45
15x2	-			4		
15x2,5	-			3,5		
16x1,5	5/8x0,065			4		
16x2	5/8x0,083			3,5		
16x2,5	5/8x0,095	3				
16x3	5/8x0,120			2,5		
18x1,5	-	26.60	27.85	-	1,5	50
18x2	-			5		
18x2,5	-			4,5		
18x3	-			4		

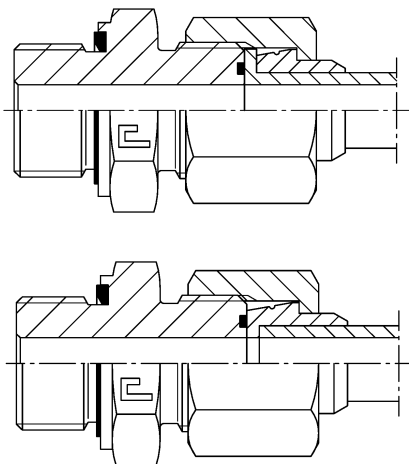
Ø Metric Tube	Ø Inch Tube	Flaring Ø		L1	L2	C
		A min	A max			
20x2	3/4x0,083	26.60	27.85	4	1,5	50
20x2,5	3/4x0,095			3,5		
20x3	3/4x0,120			3		
20x3,5	3/4x0,134			2,5		
22x2	7/8x0,083	32.95	34.20	-	1,5	60
22x2,5	7/8x0,095			-		
22x3	7/8x0,120			-		
25x2,5	1x0,095			4,5		
25x3	1x0,120			4		
25x4	1x0,156			3		
25x5	1x0,188			2		
28x2	-	39.35	40.55	-	1,5	60
28x2,5	-			-		
28x3	-			-		
30x2	-			5,5		
30x2,5	-			5		
30x3	-			4,5		
30x4	-			4		
32x3	1 1/4x0,120			4		
32x4	1 1/4x0,156	-				
35x3	-	47.25	48.50	-	1,5	70
35x4	-			-		
38x3	1 1/2x0,120			7		
38x4	1 1/2x0,156			6		

ASSEMBLY INSTRUCTIONS FOR SWIVEL NUT FITTINGS SERIES ORFS

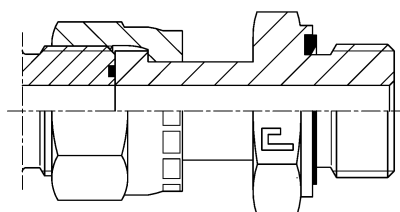
1. Before to start to assemble check for the correct parameters of all the tools to be used and substitute those not complying to the requirements.
2. Clean nut, fitting and tube and lubricate with suggested products.
3. Check the correct alignment of the parts involved, then using a wrench tighten until reaching the metal to metal contact of the parts.
4. Repeated assembly and disassembly will not alter the functionality of the products.
5. Please refer to the related tables for the correct tightening torques to be applied.



TIGHTENING TORQUES FOR TUBE ENDS AND CRIMPED NUT FITTINGS



Assembly on tube end



Assembly on crimped nut

Serie	Ø Metric Tube	Ø Inch Tube	Thread UNF/UNS/UN-2A	Torque Tube side +10% (Nm)	Torque Crimped side +10% (Nm)
UNIVERSAL	6	1/4	9/16-18	25	25
	8-10	5/16-3/8	11/16-16	40	40
	12	1/2	13/16-16	55	55
	14-15-16	5/8	1-14	60	60
	18-20	3/4	1 3/16-12	90	90
	22-25	7/8-1	1 7/16-12	125	125
	28-30-32	1 1/4	1 11/16-12	170	170
	35-38	1 1/2	2-12	200	200

Notes:

All the values reported in the above tightening tables and mere indication, and come from a series of practical tests carried out in the technical laboratory of Volpiano (TO). These may vary according to the materials and of the tolerances of the employed components.

All the values express in Newton Meters (Nm) for the tightening torques on the cone SAE J1453, represent the torquing moment necessary to have the correct tightness on the tube end side.

All the values express in Newton Meters (Nm) for the tightening torques on the crimped nut, represent the torquing moment necessary to have the correct fastening of the nut.