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Report Number: 74936710-1, Rev. 0

INSPECTION REPORT

Intermix and Interchange Tests

Tube fittings of S-LOK and Swagelok –

Pneumatic proof test,
Hydrostatic proof test,
Hydrostatic burst test, and
Helium leak test.

Client name:

HANSUN ENGINEERING CO., LTD.
(Songjeong-dong)27, Noksansandan 361-ro,
Gangseo-gu, Busan, Korea

August 30, 2013
Byung-Ho Bae, Inspector
TÜV SÜD Korea Ltd., Seoul



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1. General information

Client name	HANSUN ENGINEERING CO., LTD.
Contact person name of the client	Sung, SeeHong HANSUN ENGINEERING CO., LTD. (Songjeong-dong)27, Noksansandan 361-ro, Gangseo-gu, Busan, Korea
Tel.	+82 51-899-6751
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Description of product	S-LOK tube fitting composes of four precision parts, which are body, nut, front ferrule and back ferrule.
S-LOCK	The brand name of HANSUNG ENGINEERING
ITP No.	HSEITP-1307-001 Rev.1
Test date	July 23 ~ 25, 2013 and August 27, 2013
Test site	<u>For pneumatic proof test and helium leak test</u> KGS (Korea Gas Safety Corporation) 11 Soraesan-gil, Daeya-dong, Siheung-Si, Gyeonggi-Do, Korea <u>For hydrostatic proof test and hydrostatic burst test</u> HANSUN ENGINEERING CO., LTD. (Songjeong-dong)27, Noksansandan 361-ro, Gangseo-gu, Busan, Korea

2. Product information

The test object is verification of tightness of tube fittings of two brands, which are S-LOK and Swagelok, for interchange and intermix of their ferrules, nuts and bodies.

2.1. Preparation of test spools

2.1.1. Assembly instruction

- 1) Insert the tubing into the tube fittings until the tubing end bottoms on the shoulder of the fitting body. Make sure the nut finger-tightened
- 2) Tighten the nut 1-1/4 turn with a wrench by holding the fitting body with a back up wrench

2.2. Definition of intermix and interchange

- 2.2.1. Intermix: random mixing of components of different brands
- 2.2.2. Interchange: more specifically defined as the use of one brand nut and ferrule with another brand body

2.3. Spool description

2.3.1. Spool S-A

2.3.1.1. Interchange of S-LOK and Swagelok

2.3.1.2. Size: 1/4", 3/8", 1/2"

2.3.1.3. Maximum working pressure: 5,100 psi (35.2 MPa)

2.3.1.4. Combination: refer to Appendix 1

2.3.2. Spool S-B

2.3.2.1. Interchange of S-LOK and Swagelok

2.3.2.2. Size: 3/4", 1"

2.3.2.3. Maximum working pressure: 4,200 psi (29.0 MPa)

2.3.2.4. Combination: refer to Appendix 2

2.3.3. Spool S-C

2.3.3.1. Intermix of S-LOK and Swagelok

2.3.3.2. Size: 1/4", 3/8", 1/2", 3/4, 1"

2.3.3.3. Maximum working pressure: 4,200 psi (29.0 MPa)

2.3.3.4. Combination: refer to Appendix 3

2.4. Material of tube fittings

2.4.1. ASTM A276/479 Type316/316L(Bars)

2.4.2. ASTM A182 F316/316L(Forged)

2.5. Tubing information (ASTM A213/269 TP316/316L)

O.D Size	Thickness	Hardness(HRB)
1/4"	0.065"	78
3/8"	0.065"	74
1/2"	0.065"	77
3/4"	0.083"	86
1"	0.109"	78

2.6. Detail of tube fittings: refer to Appendix 4 ~ Appendix 11



3. Details of inspection

3.1. Summary

This inspection was carried out at Korea Gas Safety Corporation for pneumatic proof test and helium leak test, and at HANSUN ENGINEERING CO., LTD. for hydrostatic proof test and hydrostatic burst test.

The inspector carried out as bellow:

Required witness points:

- (1) Pneumatic proof test
- (2) Hydrostatic proof test
- (3) Hydrostatic burst test
- (4) Helium leak test

3.2. Test results

The inspector carried out the witness tests as following.

3.2.1. Pneumatic proof test

3.2.1.1. Test condition

3.2.1.1.1. Test method: ASTM F 1387-99, Annex 3

3.2.1.1.2. Test medium: nitrogen

3.2.1.1.3. Test pressure

3.2.1.1.3.1. Initial pressure: 0.69 Mpa

3.2.1.1.3.2. Increased pressure: 125% of maximu working pressure

3.2.1.1.4. Test sample: each one sample of Spool S-A, S-B and S-C

3.2.1.2. Results

3.2.1.2.1. Spool S-A

Condition	Requirement	Samples		
		1	-	-
Test pressure 0.69 MPa during 5 min.	No leakage	No	-	-
Test pressure 44.0 MPa during 5 min.	No leakage	No	-	-





3.2.1.2.2. Spool S-B

Condition	Requirement	Samples		
		1	-	-
Test pressure 0.69 MPa during 5 min.	No leakage	No	-	-
Test pressure 36.3 MPa during 5 min.	No leakage	No	-	-

3.2.1.2.3. Spool S-C

Condition	Requirement	Samples		
		1	-	-
Test pressure 0.69 MPa during 5 min.	No leakage	No	-	-
Test pressure 36.3 MPa during 5 min.	No leakage	No	-	-

3.2.1.3. Conclusion

The samples of Spool S-A, S-B and S-C passed the test.

3.2.2. Hydrostatic proof test

3.2.2.1. Test condition

3.2.2.1.1. Test method: ASTM F 1387-99, Annex 4

3.2.2.1.2. Test medium: water

3.2.2.1.3. Test pressure

3.2.2.1.3.1. Initial pressure: 0.69 Mpa

3.2.2.1.3.2. Increased pressure: 150% of maximum working pressure

3.2.2.1.4. Test sample: each one sample of Spool S-A, S-B and S-C

3.2.2.2. Results

3.2.2.2.1. Spool S-A

Condition	Requirement	Samples		
		1	-	-
Test pressure 0.69 MPa during 5 min.	No leakage	No	-	-
Test pressure 53.0 MPa during 5 min.	No leakage	No	-	-





3.2.2.2.2. Spool S-B

Condition	Requirement	Samples		
		1	-	-
Test pressure 0.69 MPa during 5 min.	No leakage	No	-	-
Test pressure 44.0 MPa during 5 min.	No leakage	No	-	-

3.2.2.2.3. Spool S-C

Condition	Requirement	Samples		
		1	-	-
Test pressure 0.69 MPa during 5 min.	No leakage	No	-	-
Test pressure 44.0 MPa during 5 min.	No leakage	No	-	-

3.2.2.3. Conclusion

The samples of Spool S-A, S-B and S-C passed the test.

3.2.3. Hydrostatic burst test

3.2.3.1. Test condition

3.2.3.1.1. Test method: ASTM F 1387-99, Annex 8

3.2.3.1.2. Test medium: water

3.2.3.1.3. Test pressure

3.2.3.1.3.1. Burst pressure: more than 4 times of maximum working pressure

3.2.3.1.4. Test sample: each one sample of Spool S-A, S-B and S-C

3.2.3.2. Results

3.2.3.2.1. Spool S-A

Condition	Requirement	Samples		
		1	-	-
Test pressure 141 MPa during 1 min.	No leakage	No	-	-
	No burst	No	-	-





3.2.3.2.2. Spool S-B

Condition	Requirement	Samples		
		1	-	-
Test pressure 116 MPa during 1 min.	No leakage	No	-	-
	No burst	No	-	-

3.2.3.2.3. Spool S-C

Condition	Requirement	Samples		
		1	-	-
Test pressure 116 MPa during 1 min.	No leakage	No	-	-
	No burst	No	-	-

3.2.3.3. Conclusion

The samples of Spool S-A, S-B and S-C passed the test.

3.2.4. Helium leak test

3.2.4.1. Test condition

3.2.4.1.1. Test method: Test method A of ASTM E 499-95

3.2.4.1.2. Test medium: helium

3.2.4.1.3. Test pressure: maximum working pressure of each spool

3.2.4.1.4. Test sample: each one sample of Spool S-A, S-B and S-C

3.2.4.2. Results

3.2.4.2.1. Spool S-A

Condition	Requirement	Samples	
		1	-
Leak rate at test pressure 35.2 MPa	maximum 3.0×10^{-8} (atm cc/sec)	-	-





3.2.4.2.2. Spool S-B

Condition	Samples		
	1	-	-
Leak rate at test pressure 29.0 MPa	maximum 3.0×10^{-8} (atm cc/sec)	-	-

3.2.4.2.3. Spool S-C

Condition	Samples		
	1	-	-
Leak rate at test pressure 29.0 MPa	maximum 3.0×10^{-8} (atm cc/sec)	-	-

3.2.4.3. Conclusion

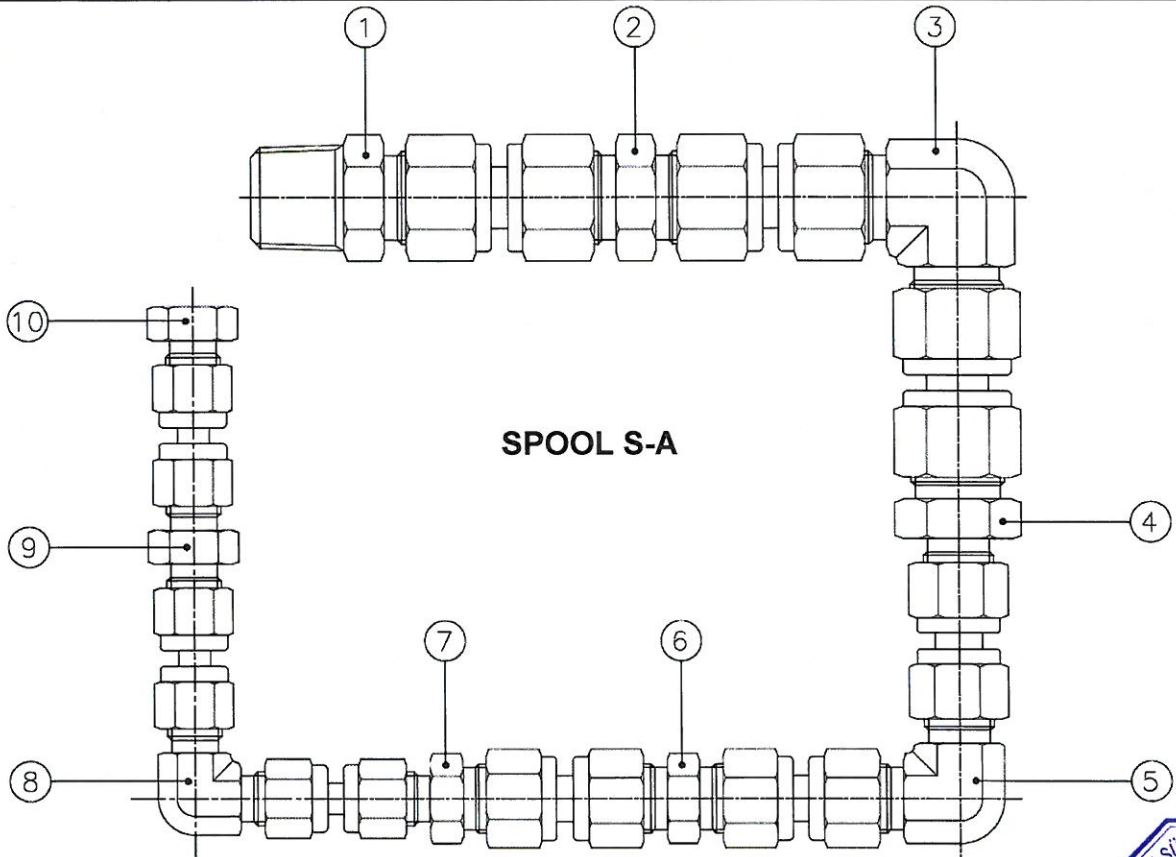
The samples of Spool S-A, S-B and S-C completed the helium leak test with the leak rates less than 3.0×10^{-8} atm cc/sec as referring above results in the section 3.2.4.2.

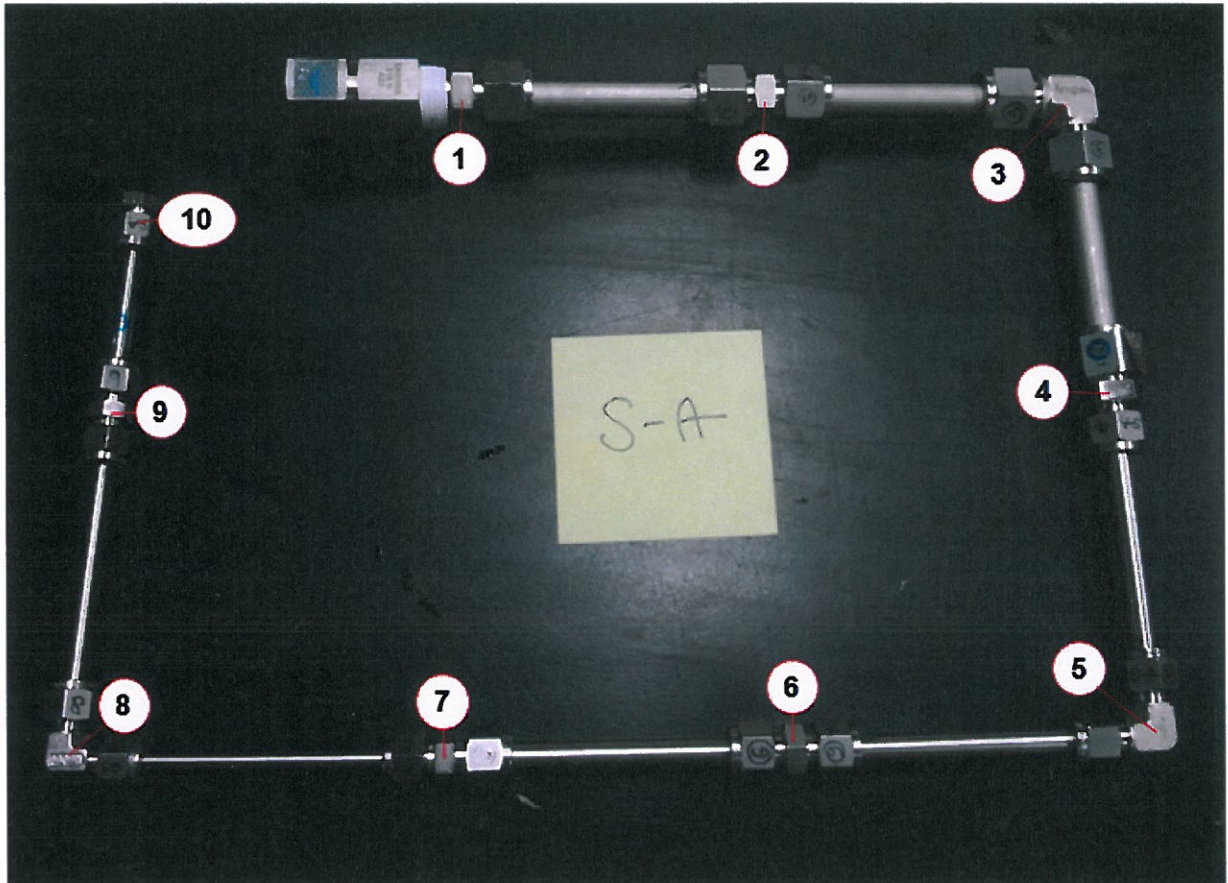
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Appendix 1. Combination of Spool S-A

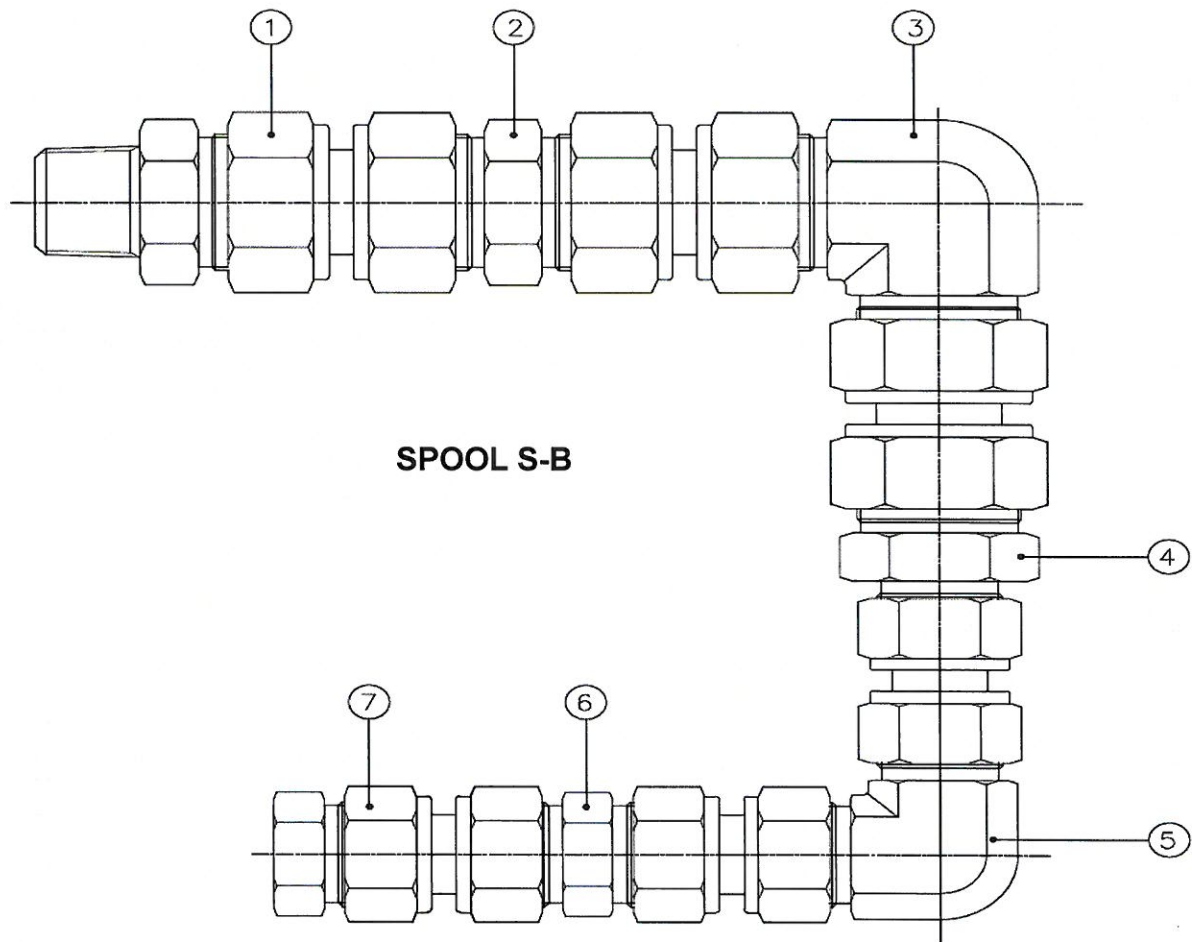
No	Item Name	Nut + Ferrule	Body	S-LOK Part No.
1	Male Connector, O.D 1/2" x M.NPT 1/2"	S-LOK	Swagelok	SMC8-8N-S6
2	Union, O.D 1/2"	Swagelok	S-LOK	SU-8-S6
3	Union Elbow, O.D 1/2"	S-LOK	Swagelok	SL-8-S6
4	Reducing Union, O.D 1/2" x O.D 3/8"	Swagelok	S-LOK	SUR8-6-S6
5	Union Elbow, O.D 3/8"	S-LOK	Swagelok	SL-6-S6
6	Union, O.D 3/8"	Swagelok	S-LOK	SU-6-S6
7	Reducing Union, O.D 3/8" x O.D 1/4"	S-LOK	Swagelok	SUR6-4-S6
8	Union Elbow, O.D 1/4"	Swagelok	S-LOK	SL-4-S6
9	Union, O.D 1/4"	S-LOK	Swagelok	SU-4-S6
10	Cap, O.D 1/4"	Swagelok	S-LOK	SC-4-S6

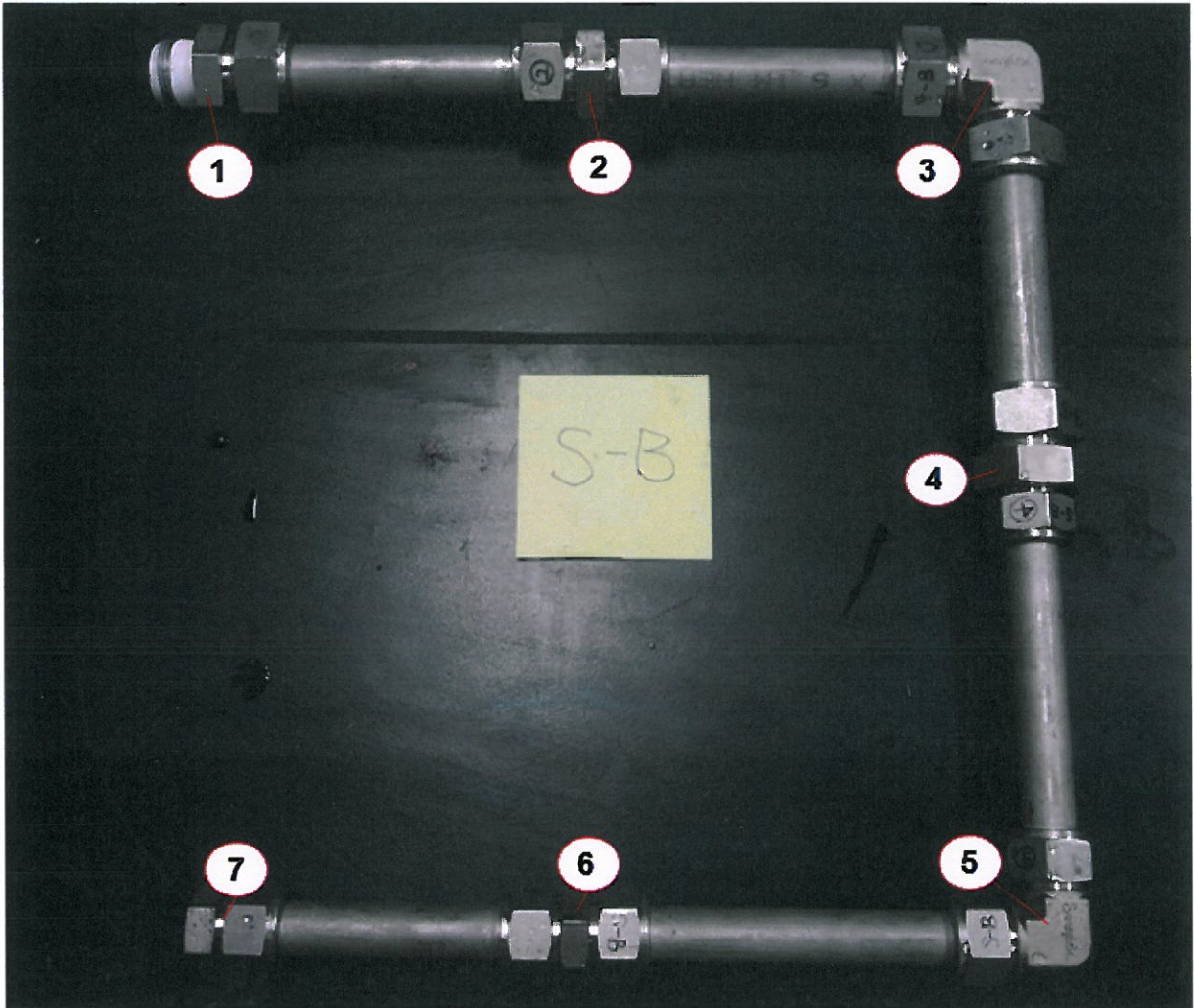




Appendix 2. Combination of Spool S-B

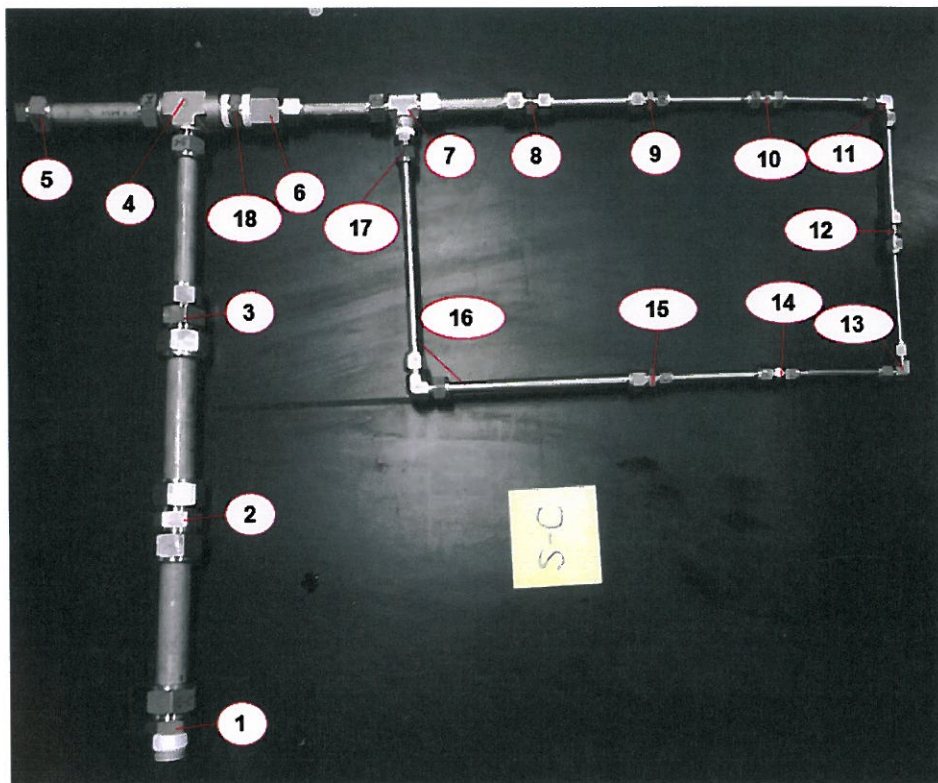
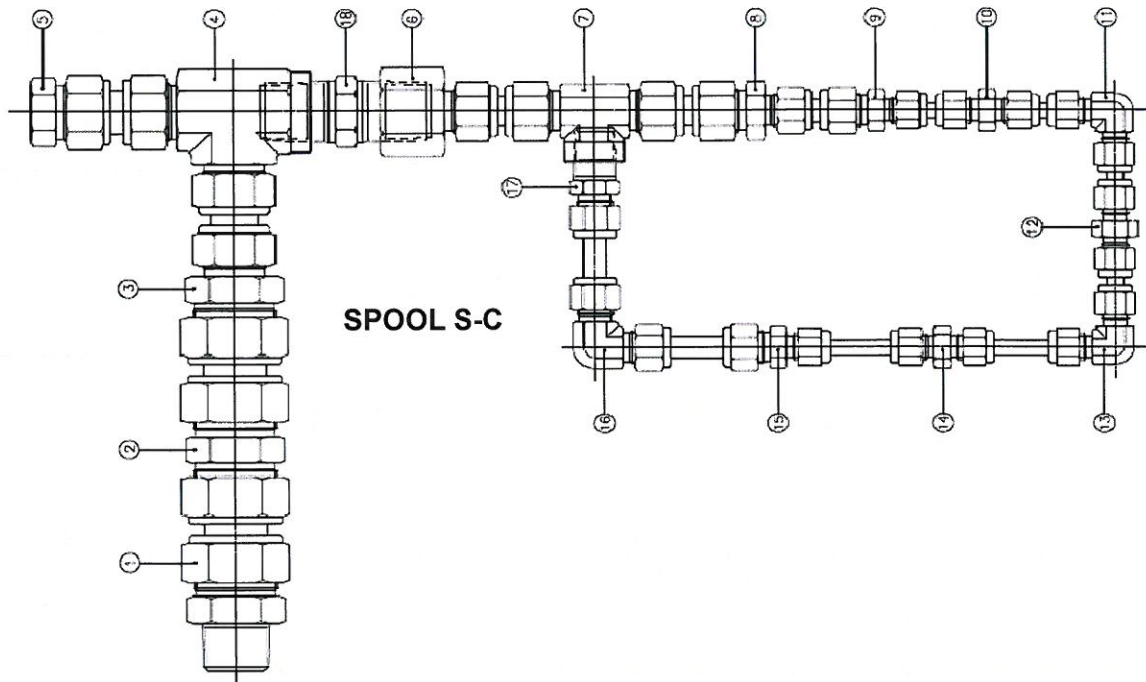
No	Item Name	Nut + Ferrule	Body	S-LOK Part No.
1	Male Connector, O.D 1" x M.NPT 3/4"	Swagelok	S-LOK	SMC16-12N-S6
2	Union, O.D 1"	S-LOK	Swagelok	SU-16-S6
3	Union Elbow, O.D 1"	Swagelok	S-LOK	SL-16-S6
4	Reducing Union, O.D 1" x O.D 3/4"	S-LOK	Swagelok	SUR16-12-S6
5	Union Elbow, O.D 3/4"	Swagelok	S-LOK	SL-12-S6
6	Union, O.D 3/4"	S-LOK	Swagelok	SU-12-S6
7	Cap, O.D 3/4"	Swagelok	S-LOK	SC-12-S6



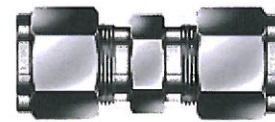
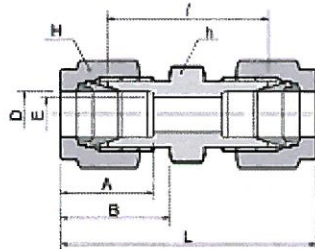


Appendix 3. Combination of Spool S-C

No	Item Name	Nut	Ferrule	Body	S-LOK Part No.
1	Male Connector, O.D 1" x M.NPT 3/4"	Swagelok	S-LOK	S-LOK	SMC16-12N-S6
2	Union, O.D 1"	S-LOK	Swagelok	Swagelok	SU-16-S6
3	Reducing Union, O.D 1" x O.D 3/4"	S-LOK	Swagelok	S-LOK	SUR16-12-S6
4	Female Run Tee, O.D 3/4" x F.NPT 3/4"	Swagelok	S-LOK	Swagelok	STRF12-12N-S6
5	Cap. O.D 3/4"	Swagelok	S-LOK	S-LOK	SC-12-S6
6	Female Connector, O.D 1/2" x F.NPT 3/4"	S-LOK	Swagelok	Swagelok	SCF8-12N-S6
7	Female Branch Tee, O.D 1/2" x F.NPT 3/8"	S-LOK	Swagelok	S-LOK	STBF8-6N-S6
8	Reducing Union, O.D 1/2" x O.D 3/8"	Swagelok	S-LOK	Swagelok	SUR8-6-S6
9	Reducing Union, O.D 3/8" x O.D 1/4"	Swagelok	S-LOK	S-LOK	SUR6-4-S6
10	Union, O.D 1/4"	S-LOK	Swagelok	Swagelok	SU-4-S6
11	Union Elbow, O.D 1/4"	S-LOK	Swagelok	S-LOK	SL-4-S6
12	Union, O.D 1/4"	Swagelok	S-LOK	Swagelok	SU-4-S6
13	Union Elbow, O.D 1/4"	Swagelok	S-LOK	S-LOK	SL-4-S6
14	Union, O.D 1/4"	S-LOK	Swagelok	Swagelok	SU-4-S6
15	Reducing Union, O.D 3/8" x O.D 1/4"	S-LOK	Swagelok	S-LOK	SUR6-4-S6
16	Union Elbow, O.D 3/8"	Swagelok	S-LOK	Swagelok	SL-6-S6
17	Male Connector, O.D 3/8" x M.NPT 3/8"	S-LOK	Swagelok	S-LOK	SMC6-6N-S6
18	Hex Nipple, M.NPT 3/4"		N/A		P-SHN-12N-S6



Appendix 4. Detail information of S-LOK tube fittings - SU, Union



Connects fractional tube

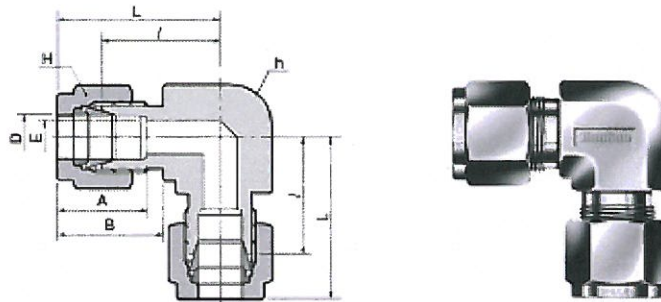
Part No.	Tube O.D.		E Min.	Width across flat				A	B	l	L
	in	mm		h	H	in	mm				
SU-1	1/16	1.59	1.27	5/16	7.93	5/16	7.93	8.63	10.92	17.50	25.15
SU-2	1/8	3.17	2.28	7/16	11.11	7/16	11.11	12.70	15.24	22.35	35.56
SU-3	3/16	4.76	3.04	7/16	11.11	1/2	12.70	13.71	16.00	24.13	37.33
SU-4	1/4	6.35	4.82	1/2	12.70	9/16	14.28	15.24	17.78	26.16	40.89
SU-5	5/16	7.93	6.35	9/16	14.28	5/8	15.87	16.25	18.54	28.19	42.92
SU-6	3/8	9.52	7.11	5/8	15.87	11/16	17.46	16.76	19.30	30.22	44.95
SU-8	1/2	12.70	10.41	13/16	20.64	7/8	22.22	22.86	21.84	30.98	51.30
SU-10	5/8	15.87	12.70	15/16	23.81	1	25.40	24.38	21.84	31.75	52.07
SU-12	3/4	19.05	15.74	1-1/16	26.98	1-1/8	28.58	24.38	21.84	33.27	53.69
SU-14	7/8	22.22	18.28	1-3/16	30.16	1-1/4	31.75	25.90	21.84	35.05	55.37
SU-16	1	25.40	22.35	1-3/8	34.92	1-1/2	38.10	31.24	26.41	40.38	64.77
SU-20	1-1/4	31.75	27.68	1-3/4	44.45	1-7/8	47.63	41.14	38.86	48.00	92.20
SU-24	1-1/2	38.10	34.03	2-1/8	53.97	2-1/4	57.15	50.03	45.21	53.60	107.95
SU-32	2	50.80	45.97	2-3/4	69.85	3	76.20	67.56	62.73	74.70	149.35

Connects metric tube

Part No.	Tube O.D.	E Min.	Width across flat		A	B	l	L
	D		h	H				
SU-2M	2	1.7	12	12	12.9	15.3	22.4	35.6
SU-3M	3	2.4	12	12	12.9	15.3	22.1	35.3
SU-4M	4	2.4	12	12	13.7	16.1	24.1	37.3
SU-6M	6	4.8	14	14	15.3	17.7	26.2	41.0
SU-8M	8	6.4	15	16	16.2	18.6	28.2	43.2
SU-10M	10	7.9	18	19	17.2	19.5	31.0	46.2
SU-12M	12	9.5	22	22	22.8	22.0	31.0	51.2
SU-15M	15	11.9	24	25	24.4	22.0	31.8	52.0
SU-16M	16	12.7	24	25	24.4	22.0	31.8	52.0
SU-18M	18	15.1	27	30	24.4	22.0	33.3	53.5
SU-20M	20	15.9	30	32	26.0	22.0	34.8	55.0
SU-22M	22	18.3	30	32	26.0	22.0	34.8	55.0
SU-25M	25	21.8	35	38	31.3	26.5	40.4	65.0
SU-28M	28	21.8	41	46	36.6	36.6	43.4	85.0
SU-32M	32	28.6	46	50	42.0	41.6	51.3	97.3
SU-38M	38	33.7	55	60	49.4	47.9	58.4	113.6

Appendix 5. Detail information of S-LOK tube fittings - SU, Union Elbow

Union Elbow
SL



Connects fractional tube

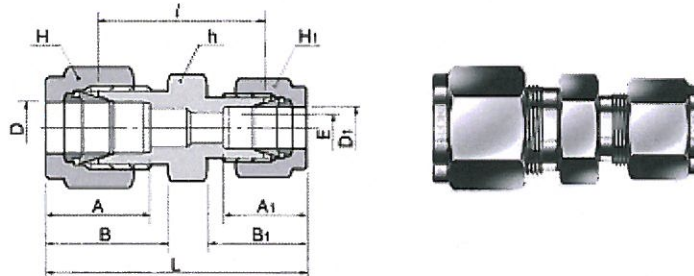
Part No.	Tube O.D. D		E Min.	Width across flat				A	B	l	L
	in	mm		h	H	h	H				
SL-1	1/16	1.59	1.27	3/8	9.52	5/16	7.93	8.63	10.92	14.00	17.88
SL-2	1/8	3.17	2.28	3/8	9.52	7/16	11.11	12.70	15.24	15.74	22.35
SL-3	3/16	4.76	3.04	1/2	12.70	1/2	12.70	13.71	16.00	17.78	24.38
SL-4	1/4	6.35	4.82	1/2	12.70	9/16	14.28	15.24	17.78	19.55	26.92
SL-5	5/16	7.93	6.35	9/16	14.28	5/8	15.87	16.25	18.54	21.33	28.70
SL-6	3/8	9.52	7.11	5/8	15.87	11/16	17.46	16.76	19.30	23.11	30.48
SL-8	1/2	12.70	10.41	13/16	20.64	7/8	22.22	22.86	21.84	25.90	36.06
SL-10	5/8	15.87	12.70	15/16	23.81	1	25.40	24.38	21.84	28.70	38.80
SL-12	3/4	19.05	15.74	1-1/16	26.98	1-1/8	28.58	24.38	21.84	29.71	39.87
SL-14	7/8	22.22	18.28	1-1/4	31.75	1-1/4	31.75	25.90	21.84	34.54	44.70
SL-16	1	25.40	22.35	1-3/8	34.9	1-1/2	38.10	31.24	26.41	36.83	49.02
SL-20	1-1/4	31.75	27.68	1-11/16	42.86	1-7/8	47.63	41.14	38.86	44.50	66.54
SL-24	1-1/2	38.10	34.03	2	50.80	2-1/4	57.15	50.03	45.21	50.80	77.97
SL-32	2	50.80	45.97	2-3/4	69.85	3	76.20	67.56	62.73	69.80	107.18

Connects metric tube

Part No.	Tube O.D. D	E Min.	Width across flat		A	B	l	L
			h	H				
SL-2M	2	1.7	9.5	12	12.9	15.3	15.7	22.3
SL-3M	3	2.4	9.5	12	12.9	15.3	15.7	22.3
SL-4M	4	2.4	12.7	12	13.7	16.4	18.8	25.4
SL-6M	6	4.8	12.7	14	15.3	17.7	19.6	27.0
SL-8M	8	6.4	14.3	16	16.2	18.6	21.3	28.8
SL-10M	10	7.9	17.5	19	17.2	19.5	23.9	31.5
SL-12M	12	9.5	20.6	22	22.8	22.0	25.9	36.0
SL-15M	15	11.9	25.4	25	24.4	22.0	28.7	38.8
SL-16M	16	12.7	25.4	25	24.4	22.0	28.7	38.8
SL-18M	18	15.1	27.0	30	24.4	22.0	29.7	39.8
SL-20M	20	15.9	31.8	32	26.0	22.0	34.5	42.6
SL-22M	22	18.3	31.8	32	26.0	22.0	34.5	42.6
SL-25M	25	21.8	34.9	38	31.3	26.5	36.8	49.1
SL-28M	28	21.8	41.0	46	36.6	36.6	43.2	64.0
SL-32M	32	28.6	46.0	50	42.0	41.6	49.3	72.3
SL-38M	38	33.7	55.0	60	49.4	47.9	58.4	84.0

Appendix 6. Detail information of S-LOK tube fittings - SUR, Reducing Union

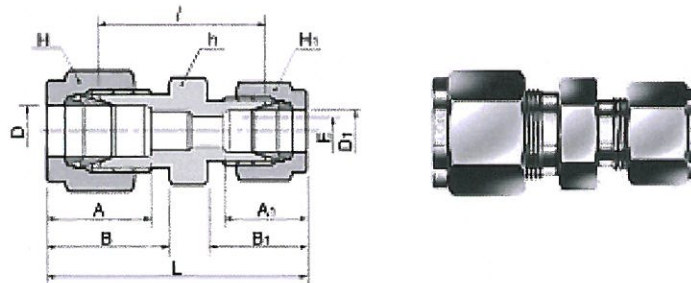
Reducing Union
SUR



Connects fractional tube

Part No.	Tube O.D.				E Min.	Width across flat						A	A ₁	B	B ₁	l	L
	D		D ₁			h		H		H ₁							
	in	mm	in	mm		in	mm	in	mm	in	mm						
SUR-2-1	1/8	3.18	1/16	1.59	1.27	7/16	11.11	7/16	11.11	5/16	7.93	12.70	8.63	15.24	10.92	20.60	30.91
SUR-3-1	3/16	4.76	1/16	1.59	1.27	7/16	11.11	1/2	12.70	5/16	7.93	13.71	8.63	16.00	10.92	21.84	32.25
SUR-3-2	3/16	4.76	1/8	3.17	2.28	7/16	11.11	1/2	12.70	7/16	11.11	13.71	12.70	16.00	15.24	23.36	36.57
SUR-4-1	1/4	6.35	1/16	1.59	1.27	1/2	12.70	9/16	14.28	5/16	7.93	15.24	8.63	17.78	10.92	23.11	34.29
SUR-4-2	1/4	6.35	1/8	3.17	2.28	1/2	12.70	9/16	14.28	7/16	11.11	15.24	12.70	17.78	15.24	24.63	38.60
SUR-4-3	1/4	6.35	3/16	4.76	3.04	1/2	12.70	9/16	14.28	1/2	12.70	15.24	13.71	17.78	16.00	25.40	39.37
SUR-5-2	5/16	7.93	1/8	3.17	2.28	9/16	14.28	5/8	15.87	7/16	11.11	16.25	12.70	18.54	15.24	25.90	39.87
SUR-5-4	5/16	7.93	1/4	6.35	4.82	9/16	14.28	5/8	15.87	9/16	14.28	16.25	15.24	18.54	17.78	27.43	42.16
SUR-6-1	3/8	9.52	1/16	1.59	1.27	5/8	15.87	11/16	17.46	5/16	7.93	16.76	8.63	19.30	10.92	25.40	36.57
SUR-6-2	3/8	9.52	1/8	3.17	2.28	5/8	15.87	11/16	17.46	7/16	11.11	16.76	12.70	19.30	15.24	26.92	40.89
SUR-6-4	3/8	9.52	1/4	6.35	4.82	5/8	15.87	11/16	17.46	9/16	14.28	16.76	15.24	19.30	17.78	28.44	43.18
SUR-6-5	3/8	9.52	5/16	7.93	6.35	5/8	15.87	11/16	17.46	5/8	15.87	16.76	16.25	19.30	18.54	29.46	44.19
SUR-8-2	1/2	12.70	1/8	3.17	2.28	13/16	20.64	7/8	22.22	7/16	11.11	22.86	12.70	21.84	15.24	28.44	45.21
SUR-8-4	1/2	12.70	1/4	6.35	4.82	13/16	20.64	7/8	22.22	9/16	14.28	22.86	15.24	21.84	17.78	29.46	46.99
SUR-8-6	1/2	12.70	3/8	9.52	7.11	13/16	20.64	7/8	22.22	11/16	17.46	22.86	16.76	21.84	19.30	30.98	48.51
SUR-10-6	5/8	15.87	3/8	9.52	7.11	15/16	23.81	1	25.40	11/16	17.46	24.38	16.76	21.84	19.30	31.75	49.27
SUR-10-8	5/8	15.87	1/2	12.70	10.41	15/16	23.81	1	25.40	7/8	22.22	24.38	22.86	21.84	21.84	31.75	52.07
SUR-12-4	3/4	19.05	1/4	6.35	4.82	1-1/16	26.98	1-1/8	28.57	9/16	14.48	24.38	15.24	21.84	17.78	31.75	49.27
SUR-12-6	3/4	19.05	3/8	9.52	7.11	1-1/16	26.98	1-1/8	28.57	11/16	17.46	24.38	16.76	21.84	19.30	33.27	50.80
SUR-12-8	3/4	19.05	1/2	12.70	10.41	1-1/16	26.98	1-1/8	28.57	7/8	22.22	24.38	22.86	21.84	21.84	33.27	53.59
SUR-12-10	3/4	19.05	5/8	15.87	12.70	1-1/16	26.98	1-1/8	28.57	1	25.40	24.38	24.38	21.84	21.84	33.27	53.59
SUR-16-8	1	25.40	1/2	12.70	10.41	1-3/8	34.92	1-1/2	38.10	7/8	22.22	31.24	22.86	26.41	21.84	40.89	63.24
SUR-16-12	1	25.40	3/4	19.05	15.74	1-3/8	34.92	1-1/2	38.10	1-1/8	28.58	31.24	24.38	26.41	21.84	40.38	62.73

Reducing Union
SUR



Connects metric tube

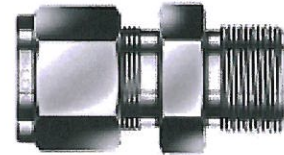
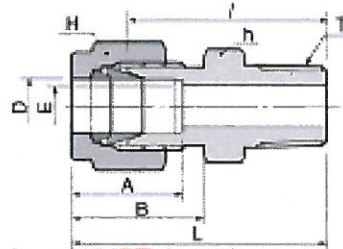
Part No	Tube O.D.		E Min.	Width across flat			A	A ₁	B	B ₁	l	L
	D	D ₁		h	H	H ₁						
SUR-3M-2M	3	2	1.7	12	12	12	12.9	12.9	15.3	15.3	22.1	35.3
SUR-6M-2M	6	2	1.7	14	14	12	15.3	12.9	17.7	15.3	24.6	38.6
SUR-6M-3M	6	3	2.4	14	14	12	15.3	12.9	17.7	15.3	24.6	38.6
SUR-6M-4M	6	4	2.4	14	14	12	15.3	13.7	17.7	16.1	25.4	39.4
SUR-8M-6M	8	6	4.8	15	16	14	16.2	15.3	18.6	17.7	27.4	42.3
SUR-10M-8M	10	6	4.8	18	19	14	17.2	15.3	19.5	17.7	29.5	44.5
SUR-10M-8M	10	8	6.4	18	19	16	17.2	16.2	19.5	18.6	30.0	45.1
SUR-12M-6M	12	6	4.8	22	22	14	22.8	15.3	22.0	17.7	29.5	47.0
SUR-12M-8M	12	8	6.4	22	22	16	22.8	16.2	22.0	18.6	30.2	47.8
SUR-12M-10M	12	10	7.9	22	22	19	22.8	17.2	22.0	19.5	31.0	48.7
SUR-16M-10M	16	10	7.9	24	25	19	24.4	17.2	22.0	19.5	31.8	49.5
SUR-16M-12M	16	12	9.5	24	25	22	24.4	22.8	22.0	22.0	31.8	52.0
SUR-18M-12M	18	12	9.5	27	30	22	24.4	22.8	22.0	22.0	33.3	53.5
SUR-25M-18M	25	18	15.1	35	38	30	31.3	24.4	26.5	22.0	38.6	61.0
SUR-25M-20M	25	20	15.9	35	38	32	31.3	26.0	26.5	22.0	39.9	62.3

Connects metric tube to fractional tube

Part No.	Tube O.D.		E Min.	Width across flat			A	A ₁	B	B ₁	l	L
	D	D ₁ in mm		h	H	H ₁						
SUR-3M-2	3	1/8 3.17	2.4	12	12	11.1	12.9	12.8	15.3	15.2	22.1	35.2
SUR-4M-2	4	1/8 3.17	2.4	12	12	11.1	13.7	12.8	16.1	15.2	23.4	36.5
SUR-4M-4	4	1/4 6.35	2.4	14	12	14.3	13.7	15.3	16.1	17.7	25.4	39.4
SUR-6M-2	6	1/8 3.17	2.4	14	14	11.1	15.3	12.8	17.7	15.2	24.6	38.5
SUR-6M-4	6	1/4 6.35	4.8	14	14	14.3	15.3	15.8	17.7	17.7	26.2	41.0
SUR-6M-5	6	5/16 7.93	4.8	14	14	15.9	15.3	16.2	17.7	18.6	27.4	42.3
SUR-8M-4	8	1/4 6.35	4.8	15	16	14.3	16.2	15.3	18.6	17.7	27.4	42.3
SUR-10M-2	10	1/8 3.17	2.4	18	19	11.1	17.2	12.8	19.5	15.2	27.7	41.8
SUR-10M-4	10	1/4 6.35	4.8	18	19	14.3	17.2	15.3	19.5	17.7	29.5	44.5
SUR-10M-5	10	5/16 7.93	6.4	18	19	15.9	17.2	16.2	19.5	18.6	30.3	45.1
SUR-10M-6	10	3/8 9.52	7.1	18	19	17.5	17.2	16.9	19.5	18.6	31.0	45.9
SUR-12M-5	12	5/16 7.93	6.4	22	22	15.9	22.8	16.2	22.0	18.6	30.2	47.8
SUR-12M-6	12	3/8 9.52	7.1	22	22	17.5	22.8	16.9	22.0	19.2	31.0	48.4
SUR-12M-8	12	1/2 12.70	9.5	22	22	22.2	22.8	22.8	22.0	22.0	31.0	51.2
SUR-15M-8	15	1/2 12.70	10.3	24	25	22.2	24.4	22.8	22.0	22.0	31.8	52.0
SUR-16M-10	16	5/8 15.87	12.7	24	25	25.4	24.4	24.4	22.0	22.0	31.8	52.0
SUR-18M-12	18	3/4 19.05	15.1	27	30	28.6	24.4	24.4	22.0	22.0	33.3	53.5
SUR-20M-12	20	3/4 19.05	15.9	30	32	28.6	26.0	24.4	22.0	22.0	34.6	54.9
SUR-20M-16	20	1 25.40	15.9	34.9	32	38.1	26.0	31.2	22.0	26.4	38.0	60.3
SUR-22M-16	22	1 25.40	18.3	34.9	32	38.1	26.0	31.2	22.0	26.4	38.2	60.3

Appendix 7. Detail information of S-LOK tube fittings – SMC-N, Male Connector

Male Connector
SMC-N

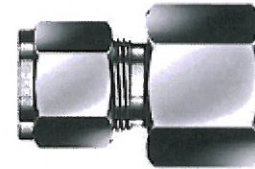
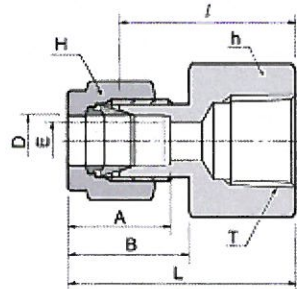


Connects fractional tube to female NPT thread

Part No.	Tube O.D.		T (NPT)	E Min.	Width across flat				A	B	i	L
	in	mm			in	h	mm	in				
SMC-1-1N	1/16	1.59	1/16	1.27	5/16	7.93	5/16	7.93	8.63	10.92	20.00	23.63
SMC-1-2N	1/16	1.59	1/8	1.27	7/16	11.11	5/16	7.93	8.63	10.92	22.85	26.23
SMC-1-4N	1/16	1.59	1/4	1.27	9/16	14.28	5/16	7.93	8.63	10.92	27.17	30.98
SMC-2-1N	1/8	3.17	1/16	2.28	7/16	11.11	7/16	11.11	12.70	15.24	23.11	29.71
SMC-2-2N	1/8	3.17	1/8	2.28	7/16	11.11	7/16	11.11	12.70	15.24	23.87	30.48
SMC-2-4N	1/8	3.17	1/4	2.28	9/16	14.28	7/16	11.11	12.70	15.24	28.95	35.56
SMC-2-6N	1/8	3.17	3/8	2.28	11/16	17.46	7/16	11.11	12.70	15.24	29.21	35.81
SMC-2-8N	1/8	3.17	1/2	2.28	7/8	22.22	7/16	11.11	12.70	15.24	35.56	42.16
SMC-3-2N	3/16	4.76	1/8	3.04	7/16	11.11	1/2	12.70	13.71	16.00	24.63	31.24
SMC-3-4N	3/16	4.76	1/4	3.04	9/16	14.28	1/2	12.70	13.71	16.00	29.71	36.32
SMC-4-1N	1/4	6.35	1/16	4.82	1/2	12.70	9/16	14.28	15.24	17.78	25.40	32.76
SMC-4-2N	1/4	6.35	1/8	4.82	1/2	12.70	9/16	14.28	15.24	17.78	25.40	32.76
SMC-4-4N	1/4	6.35	1/4	4.82	9/16	14.28	9/16	14.28	15.24	17.78	30.48	37.64
SMC-4-6N	1/4	6.35	3/8	4.82	11/16	17.46	9/16	14.28	15.24	17.78	30.98	38.35
SMC-4-8N	1/4	6.35	1/2	4.82	7/8	22.22	9/16	14.28	15.24	17.78	37.33	44.70
SMC-4-12N	1/4	6.35	3/4	4.82	1-1/16	26.98	9/16	14.28	15.24	17.78	38.86	46.22
SMC-5-2N	5/16	7.93	1/8	4.82	9/16	14.28	5/8	15.87	16.25	18.54	28.67	34.03
SMC-5-4N	5/16	7.93	1/4	6.35	9/16	14.28	5/8	15.87	16.25	18.54	31.24	38.60
SMC-5-6N	5/16	7.93	3/8	6.35	11/16	17.46	5/8	15.87	16.25	18.54	31.75	39.11
SMC-5-8N	5/16	7.93	1/2	6.35	7/8	22.22	5/8	15.87	16.25	18.54	38.11	45.60
SMC-6-2N	3/8	9.52	1/8	4.82	5/8	15.87	11/16	17.46	16.76	19.30	27.94	35.30
SMC-6-4N	3/8	9.52	1/4	7.11	5/8	15.87	11/16	17.46	16.76	19.30	32.51	39.87
SMC-6-6N	3/8	9.52	3/8	7.11	11/16	17.46	11/16	17.46	16.76	19.30	32.51	39.87
SMC-6-8N	3/8	9.52	1/2	7.11	7/8	22.22	11/16	17.46	16.76	19.30	38.86	46.22
SMC-6-12N	3/8	9.52	3/4	7.11	1-1/16	26.98	11/16	17.46	16.76	19.30	40.38	47.75
SMC-8-2N	1/2	12.70	1/8	4.82	13/16	20.64	7/8	22.22	22.86	21.84	28.70	38.86
SMC-8-4N	1/2	12.70	1/4	7.11	13/16	20.64	7/8	22.22	22.86	21.84	33.27	43.43
SMC-8-6N	1/2	12.70	3/8	9.65	13/16	20.64	7/8	22.22	22.86	21.84	33.27	43.43
SMC-8-8N	1/2	12.70	1/2	10.41	7/8	22.22	7/8	22.22	22.86	21.84	38.86	49.02
SMC-8-12N	1/2	12.70	3/4	10.41	1-1/16	26.98	7/8	22.22	22.86	21.84	40.38	50.54
SMC-8-16N	1/2	12.70	1	10.41	1-3/8	34.92	7/8	22.22	22.86	21.84	46.99	57.15
SMC-10-6N	5/8	15.87	3/8	9.65	15/16	23.81	1	25.40	24.38	21.84	34.03	44.19
SMC-10-8N	5/8	15.87	1/2	11.93	15/16	23.81	1	25.40	24.38	21.84	38.86	49.02
SMC-10-12N	5/8	15.87	3/4	12.70	1-1/16	26.98	1	25.40	24.38	21.84	40.38	50.54
SMC-12-8N	3/4	19.05	1/2	11.93	1-1/16	26.98	1-1/8	28.58	24.38	21.84	40.38	50.54
SMC-12-12N	3/4	19.05	3/4	15.74	1-1/16	26.98	1-1/8	28.58	24.38	21.84	40.38	50.54
SMC-12-16N	3/4	19.05	1	15.74	1-3/8	34.92	1-1/8	28.58	24.38	21.84	46.99	57.15
SMC-14-12N	7/8	22.22	3/4	15.74	1-3/16	30.16	1-1/4	31.75	25.90	21.84	40.38	50.54
SMC-14-16N	7/8	22.22	1	16.28	1-3/8	34.92	1-1/4	31.75	25.90	21.84	46.99	57.15
SMC-16-8N	1	25.40	1/2	11.93	1-3/8	34.92	1-1/2	38.10	31.24	26.41	45.21	57.40
SMC-16-12N	1	25.40	3/4	15.74	1-3/8	34.92	1-1/2	38.10	31.24	26.41	45.21	57.40
SMC-16-16N	1	25.40	1	22.35	1-3/8	34.92	1-1/2	38.10	31.24	26.41	50.03	62.23
SMC-20-16N	1-1/4	31.75	1	22.35	1-3/4	44.45	1-7/8	47.63	41.14	38.86	55.11	77.21
SMC-20-20N	1-1/4	31.75	1-1/4	27.68	1-3/4	44.45	1-7/8	47.63	41.14	38.86	55.11	77.21
SMC-20-24N	1-1/4	31.75	1-1/2	27.68	1-3/4	44.45	1-7/8	47.63	41.14	38.86	60.54	82.64
SMC-24-20N	1-1/2	38.10	1-1/4	27.68	2-1/8	53.98	2-1/4	57.15	50.03	45.21	59.42	86.60
SMC-24-24N	1-1/2	38.10	1-1/2	34.03	2-1/8	53.98	2-1/4	57.15	50.03	45.21	61.72	88.90
SMC-24-32N	1-1/2	38.10	2	34.03	2-3/4	69.85	2-1/4	57.15	50.03	45.21	62.42	99.75
SMC-32-8N	2	50.80	1/2	11.93	2-3/4	69.85	3	76.20	67.56	62.73	68.40	105.73
SMC-32-20N	2	50.80	1-1/4	45.97	2-3/4	69.85	3	76.20	67.56	62.73	71.40	108.73
SMC-32-24N	2	50.80	1-1/2	45.97	2-3/4	69.85	3	76.20	67.56	62.73	75.50	112.83
SMC-32-32N	2	50.80	2	45.97	2-3/4	69.85	3	76.20	67.56	62.73	76.20	112.83

Appendix 8. Detail information of S-LOK tube fittings – SCF, Female Connector

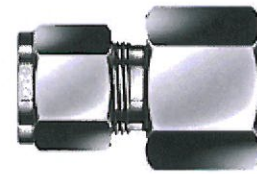
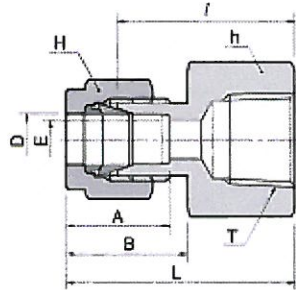
Female Connector
SCF



Connects fractional tube to male NPT thread

Part No.	Tube O.D.		T (NPT)	E Min.	Width across flat				A	B	I	L
	D in	mm			h	H	in	mm				
SCF - 1-1N	1/16	1.59	1/16	1.27	7/16	11.11	5/16	7.93	8.63	10.92	19.81	23.62
SCF - 1-2N	1/16	1.59	1/8	1.27	9/16	14.28	5/16	7.93	8.63	10.92	20.57	24.38
SCF - 2-2N	1/8	3.17	1/8	2.28	9/16	14.28	7/16	11.11	12.70	15.24	22.09	28.70
SCF - 2-4N	1/8	3.17	1/4	2.28	3/4	19.05	7/16	11.11	12.70	15.24	26.92	33.52
SCF - 3-2N	3/16	4.76	1/8	3.04	9/16	14.28	1/2	12.70	13.71	16.00	23.11	29.71
SCF - 4-2N	1/4	6.35	1/8	4.82	9/16	14.28	9/16	14.28	15.24	17.78	23.87	31.24
SCF - 4-4N	1/4	6.35	1/4	4.82	3/4	19.05	9/16	14.28	15.24	17.78	28.44	35.81
SCF - 4-6N	1/4	6.35	3/8	4.82	7/8	22.22	9/16	14.28	15.24	17.78	30.22	37.59
SCF - 4-8N	1/4	6.35	1/2	4.82	1-1/16	26.98	9/16	14.28	15.24	17.78	35.05	42.41
SCF - 5-2N	5/16	7.93	1/8	6.35	9/16	14.28	5/8	15.87	16.25	18.54	24.63	32.00
SCF - 5-4N	5/16	7.93	1/4	6.35	3/4	19.05	5/8	15.87	16.25	18.54	29.46	36.83
SCF - 6-2N	3/8	9.52	1/8	7.11	5/8	15.87	11/16	17.46	16.76	19.30	25.40	32.76
SCF - 6-4N	3/8	9.52	1/4	7.11	3/4	19.05	11/16	17.46	16.76	19.30	30.22	37.59
SCF - 6-6N	3/8	9.52	3/8	7.11	7/8	22.22	11/16	17.46	16.76	19.30	31.75	39.11
SCF - 6-8N	3/8	9.52	1/2	7.11	1-1/16	26.98	11/16	17.46	16.76	19.30	36.57	43.94
SCF - 6-12N	3/8	9.52	3/4	7.11	1-5/16	33.33	11/16	17.46	16.76	19.30	40.38	47.75
SCF - 8-4N	1/2	12.70	1/4	10.41	1-3/16	20.64	7/8	22.22	22.86	21.84	30.22	40.38
SCF - 8-6N	1/2	12.70	3/8	10.41	7/8	22.22	7/8	22.22	22.86	21.84	31.75	41.91
SCF - 8-8N	1/2	12.70	1/2	10.41	1-1/16	26.98	7/8	22.22	22.86	21.84	36.57	46.73
SCF - 8-12N	1/2	12.70	3/4	10.41	1-5/16	33.33	7/8	22.22	22.86	21.84	38.10	48.26
SCF - 10-6N	5/8	15.87	3/8	12.70	15/16	23.81	1	25.40	24.38	21.84	31.75	41.91
SCF - 10-8N	5/8	15.87	1/2	12.70	1-1/16	26.98	1	25.40	24.38	21.84	36.57	46.73
SCF - 10-12N	5/8	15.87	3/4	12.70	1-5/16	33.33	1	25.40	24.38	21.84	38.10	48.26
SCF - 12-8N	3/4	19.05	1/2	15.74	1-1/16	26.98	1-1/8	28.58	24.38	21.84	36.57	46.73
SCF - 12-12N	3/4	19.05	3/4	15.74	1-5/16	33.33	1-1/8	28.58	24.38	21.84	38.10	48.26
SCF - 14-12N	7/8	22.22	3/4	18.28	1-5/16	33.33	1-1/4	31.75	25.90	21.84	39.62	49.78
SCF - 16-12N	1	25.40	3/4	22.35	1-3/8	34.92	1-1/2	38.10	31.24	26.41	41.14	53.34
SCF - 16-16N	1	25.40	1	22.35	1-5/8	41.27	1-1/2	38.10	31.24	26.41	50.03	62.23
SCF - 20-20N	1-1/4	31.75	1-1/4	27.68	2-1/8	53.98	1-7/8	47.63	41.14	38.86	52.57	74.87
SCF - 24-24N	1-1/2	38.10	1-1/2	34.03	2-3/8	60.33	2-1/4	57.15	50.03	45.21	56.13	83.31
SCF - 32-32N	2	50.80	2	45.97	2-1/8	73.03	3	76.20	67.56	62.73	64.26	101.60

Female Connector SCF

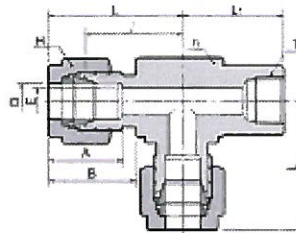


Connects metric tube to male ISO tapered thread

Part No.	Tube O.D.	T R(PT)	E Min.	Width across flat		A	B	l	L
	D			h	H				
SCF-3M-2R	3	1/8	2.4	14	12	12.9	15.3	22.1	28.7
SCF-3M-4R	3	1/4	2.4	19	12	12.9	15.3	26.9	33.5
SCF-4M-2R	4	1/8	2.4	14	12	13.7	16.1	23.1	29.7
SCF-6M-2R	6	1/8	4.8	14	14	15.3	17.7	23.9	31.3
SCF-6M-4R	6	1/4	4.8	19	14	15.3	17.7	28.4	35.8
SCF-6M-6R	6	3/8	4.8	22	14	15.3	17.7	29.5	36.9
SCF-6M-8R	6	1/2	4.8	27	14	15.3	17.7	35.1	42.5
SCF-8M-2R	8	1/8	6.4	15	16	16.2	18.6	24.6	32.1
SCF-8M-4R	8	1/4	6.4	19	16	16.2	18.6	29.5	37.0
SCF-8M-6R	8	3/8	6.4	22	16	16.2	18.6	30.2	37.7
SCF-8M-8R	8	1/2	6.4	27	16	16.2	18.6	35.8	43.3
SCF-10M-2R	10	1/8	7.9	18	19	17.2	19.5	25.4	33.0
SCF-10M-4R	10	1/4	7.9	19	19	17.2	19.5	30.2	37.8
SCF-10M-6R	10	3/8	7.9	22	19	17.2	19.5	31.0	38.6
SCF-10M-8R	10	1/2	7.9	27	19	17.2	19.5	36.6	44.2
SCF-12M-2R	12	1/8	8.3	22	22	22.8	22.0	28.4	38.5
SCF-12M-4R	12	1/4	9.5	22	22	22.8	22.0	30.2	40.3
SCF-12M-6R	12	3/8	9.5	22	22	22.8	22.0	31.0	41.1
SCF-12M-8R	12	1/2	9.5	27	22	22.8	22.0	36.6	46.7
SCF-12M-12R	12	3/4	9.5	35	22	22.8	22.0	38.9	49.0
SCF-15M-8R	15	1/2	11.9	27	25	24.4	22.0	36.6	46.7
SCF-16M-8R	16	1/2	12.7	27	25	24.4	22.0	36.6	46.9
SCF-20M-8R	20	1/2	15.9	30	32	26.0	22.0	37.8	47.9
SCF-20M-12R	20	3/4	15.9	35	32	26.0	22.0	39.6	49.7
SCF-22M-12R	22	3/4	18.3	35	32	26.0	22.0	39.6	49.7
SCF-22M-16R	22	1	18.3	41	32	26.0	22.0	47.8	57.9
SCF-25M-12R	25	3/4	21.8	35	38	31.3	26.5	41.1	53.4
SCF-25M-16R	25	1	21.8	41	38	31.3	26.5	50.0	62.3

Appendix 9. Detail information of S-LOK tube fittings – STRF, Female Run Tee

Female Run Tee
STRF



Connects fractional tube to male NPT thread

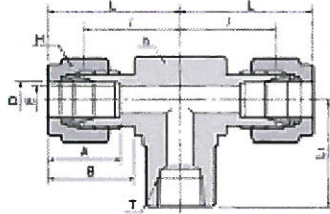
Part No.	Tube O.D. D		T (NPT)	E Min.	Width across flat				A	B	I	L	L1
	in	mm			h	H	in	mm					
STRF-2-2N	1/8	3.17	1/8	2.28	1/2	12.70	7/16	11.11	12.70	15.24	18.03	24.63	19.05
STRF-2-4N	1/8	3.17	1/4	2.28	11/16	17.46	7/16	11.11	12.70	15.24	20.82	27.43	22.35
STRF-3-2N	3/16	4.76	1/8	3.04	1/2	12.70	1/2	12.70	13.71	16.00	18.79	25.40	19.05
STRF-4-2N	1/4	6.35	1/8	4.82	1/2	12.70	9/16	14.28	15.24	17.78	19.55	26.92	19.05
STRF-4-4N	1/4	6.35	1/4	4.82	11/16	17.46	9/16	14.28	15.24	17.78	22.86	29.71	22.35
STRF-4-6N	1/4	6.35	3/8	4.82	13/16	20.64	9/16	14.28	15.24	17.78	24.38	31.75	22.35
STRF-4-8N	1/4	6.35	1/2	4.82	1	25.40	9/16	14.28	15.24	17.78	27.17	34.54	28.44
STRF-5-2N	5/16	7.94	1/8	6.35	9/16	14.28	5/8	15.87	16.25	18.54	21.33	28.70	19.05
STRF-5-4N	5/16	7.94	1/4	6.35	11/16	17.46	5/8	15.87	16.25	18.54	23.11	30.48	22.35
STRF-6-2N	3/8	9.52	1/8	7.11	5/8	15.87	11/16	17.46	16.76	19.30	23.11	30.48	19.05
STRF-6-4N	3/8	9.52	1/4	7.11	11/16	17.46	11/16	17.46	16.76	19.30	23.87	31.24	22.35
STRF-6-6N	3/8	9.52	3/8	6.35	13/16	20.64	11/16	17.46	16.76	19.30	25.90	33.27	22.35
STRF-6-8N	3/8	9.52	1/2	7.11	1	25.40	11/16	17.46	16.76	19.30	28.70	36.06	28.44
STRF-8-4N	1/2	12.70	1/4	10.41	13/16	20.64	7/8	22.22	22.86	21.84	25.90	36.06	22.35
STRF-8-6N	1/2	12.70	3/8	10.41	13/16	20.64	7/8	22.22	22.86	21.84	25.90	36.06	22.35
STRF-8-8N	1/2	12.70	1/2	10.41	1	25.40	7/8	22.22	22.86	21.84	29.71	39.87	28.44
STRF-10-6N	5/8	15.87	3/8	12.70	15/16	23.81	1	25.40	24.38	21.84	27.94	38.10	22.35
STRF-10-8N	5/8	15.87	1/2	12.70	1	25.40	1	25.40	24.38	21.84	28.70	38.86	28.44
STRF-12-8N	3/4	19.05	1/2	15.74	1-1/16	26.98	1-1/8	28.58	24.38	21.84	29.71	39.87	28.44
STRF-12-12N	3/4	19.05	3/4	15.74	1-1/4	31.75	1-1/8	28.58	24.38	21.84	34.54	44.70	31.75
STRF-14-12N	7/8	22.22	3/4	18.28	1-1/4	31.75	1-1/4	31.75	31.75	21.84	34.54	44.70	31.75
STRF-16-12N	1	25.40	3/4	22.35	1-27/64	36.12	1-1/2	38.10	38.10	26.41	36.83	49.02	31.75
STRF-16-16N	1	25.40	1	22.35	1-1/16	42.86	1-1/2	38.10	38.10	26.41	41.40	50.29	38.10

Connects metric tube to male NPT thread

Part No.	Tube O.D. D		T (NPT)	E Min.	Width across flat				A	B	I	L	L1
	in	mm			h	H	in	mm					
STRF-6M-2N	6	1/8	4.8	4.8	12.70	14	15.3	17.7	19.6	27.0	19.00		
STRF-6M-4N	6	1/4	4.8	4.8	17.46	14	15.3	17.7	22.4	29.8	22.40		
STRF-6M-6N	6	3/8	4.8	4.8	20.64	14	15.3	17.7	24.4	31.7	22.40		
STRF-6M-8N	6	1/2	4.8	4.8	25.40	14	15.3	17.7	27.2	34.5	28.40		
STRF-8M-2N	8	1/8	6.4	6.4	15.87	16	16.2	18.6	23.1	29.9	19.00		
STRF-8M-4N	8	1/4	6.4	6.4	17.46	16	16.2	18.6	23.1	30.6	22.40		
STRF-8M-6N	8	3/8	6.4	6.4	20.64	16	16.2	18.6	25.2	32.4	22.40		
STRF-8M-8N	8	1/2	6.4	6.4	25.40	16	16.2	18.6	28.0	35.2	28.40		
STRF-10M-2N	10	1/8	7.9	7.9	20.64	19	17.2	19.5	23.9	31.5	19.00		
STRF-10M-4N	10	1/4	7.9	7.9	20.64	19	17.2	19.5	25.9	33.6	22.40		
STRF-10M-6N	10	3/8	7.9	7.9	20.64	19	17.2	19.5	25.9	33.6	22.40		
STRF-10M-8N	10	1/2	7.9	7.9	25.40	19	17.2	19.5	26.2	33.6	28.40		
STRF-12M-4N	12	1/4	9.5	9.5	20.64	22	22.8	22.0	25.9	36.0	22.40		
STRF-12M-6N	12	3/8	9.5	9.5	20.64	22	22.8	22.0	25.9	36.0	22.40		
STRF-12M-8N	12	1/2	9.5	9.5	25.40	22	22.8	22.0	29.7	40.0	28.40		
STRF-16M-8N	16	1/2	12.7	12.7	25.40	25	24.4	22.0	29.7	40.0	28.40		

Appendix 10. Detail information of S-LOK tube fittings – STBF, Female Branch Tee

Female Branch Tee
STBF



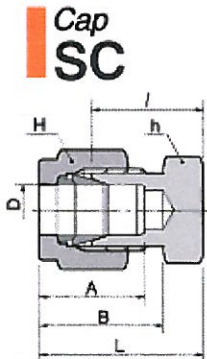
Connects fractional tube to male NPT thread

Part No.	Tube O.D. D		T (NPT)	E Min.	Width across flat				A	B	L	L ₁	
	in	mm			h	H	in	mm					
STBF-2-2N	1/8	3.17	1/8	2.25	1/2	12.70	7/16	11.11	12.70	15.24	18.03	24.38	19.05
STBF-2-4N	1/8	3.17	1/4	2.28	11/16	17.46	7/16	11.11	12.70	15.24	20.82	27.43	22.35
STBF-3-2N	3/16	4.76	1/8	3.04	1/2	12.70	1/2	12.70	13.71	16.00	18.79	25.40	19.05
STBF-4-2N	1/4	6.35	1/8	4.82	1/2	12.70	9/16	14.28	15.24	17.78	19.55	26.92	19.05
STBF-4-4N	1/4	6.35	1/4	4.82	11/16	17.46	9/16	14.28	15.24	17.78	22.35	29.71	22.35
STBF-4-6N	1/4	6.35	3/8	4.82	13/16	20.64	9/16	14.28	15.24	17.78	24.38	31.75	22.35
STBF-4-8N	1/4	6.35	1/2	4.82	1	25.40	9/16	14.28	15.24	17.78	27.17	34.54	28.44
STBF-5-2N	5/16	7.94	1/8	6.35	9/16	14.28	5/8	15.87	16.25	18.54	21.33	28.70	19.05
STBF-5-4N	5/16	7.94	1/4	6.35	11/16	17.46	5/8	15.87	16.25	18.54	23.11	30.48	22.35
STBF-6-2N	3/8	9.52	1/8	7.11	5/8	15.87	11/16	17.46	16.76	19.30	23.11	30.48	19.05
STBF-6-4N	3/8	9.52	1/4	7.11	11/16	17.46	11/16	17.46	16.76	19.30	23.87	31.24	22.35
STBF-6-6N	3/8	9.52	3/8	6.35	13/16	20.64	11/16	17.46	16.76	19.30	25.90	33.27	22.35
STBF-6-8N	3/8	9.52	1/2	7.11	1	25.40	11/16	17.46	16.76	19.30	28.70	36.06	28.44
STBF-8-4N	1/2	12.70	1/4	10.41	13/16	20.64	7/8	22.22	22.86	21.84	25.90	36.06	22.35
STBF-8-6N	1/2	12.70	3/8	10.41	13/16	20.64	7/8	22.22	22.86	21.84	25.90	36.06	22.35
STBF-8-8N	1/2	12.70	1/2	10.41	1	25.40	7/8	22.22	22.86	21.84	29.71	39.87	28.44
STBF-10-6N	5/8	15.87	3/8	12.70	15/16	23.81	1	25.40	24.38	21.84	27.94	38.10	22.35
STBF-10-8N	5/8	15.87	1/2	12.70	1	25.40	1	25.40	24.38	21.84	28.70	38.86	28.44
STBF-12-8N	3/4	19.05	1/2	15.74	1-1/16	28.98	1-1/8	28.58	24.38	21.84	29.71	39.87	28.44
STBF-12-12N	3/4	19.05	3/4	15.74	1-1/4	31.75	1-1/8	28.58	24.38	21.84	34.54	44.70	31.75
STBF-14-12N	7/8	22.22	3/4	18.28	1-1/4	31.75	1-1/4	31.75	25.90	21.84	34.54	44.70	31.75
STBF-16-12N	1	25.40	3/4	22.35	1-27/64	36.00	1-1/2	38.10	31.24	26.41	36.83	49.02	31.75
STBF-16-16N	1	25.40	1	22.35	1-11/16	42.86	1-1/2	38.10	31.24	26.41	41.40	53.59	38.10

Connects metric tube to male NPT thread

Part No.	Tube O.D. D		T (NPT)	E Min.	Width across flat		A	B	L	L ₁	
	in	mm			h	H					
STBF-6M-2N	6	1/8	1/8	4.8	12.70	14	15.3	17.7	19.6	27.0	19.00
STBF-6M-4N	6	1/4	1/4	4.8	17.46	14	15.3	17.7	22.4	29.8	22.40
STBF-6M-6N	6	3/8	3/8	4.8	20.64	14	15.3	17.7	24.4	31.7	22.40
STBF-6M-8N	6	1/2	1/2	4.8	25.40	14	15.3	17.7	27.2	34.5	28.40
STBF-8M-2N	8	1/8	1/8	6.4	15.87	16	16.2	18.6	23.1	29.9	19.00
STBF-8M-4N	8	1/4	1/4	6.4	17.46	16	16.2	18.6	23.1	30.6	22.40
STBF-8M-6N	8	3/8	3/8	6.4	20.64	16	16.2	18.6	25.2	32.4	22.40
STBF-8M-8N	8	1/2	1/2	6.4	25.40	16	16.2	18.6	28.0	35.2	28.40
STBF-10M-2N	10	1/8	1/8	7.9	17.50	19	17.2	19.5	23.9	31.5	19.00
STBF-10M-4N	10	1/4	1/4	7.9	20.64	19	17.2	19.5	25.9	33.5	22.40
STBF-10M-6N	10	3/8	3/8	7.9	20.64	19	17.2	19.5	25.9	33.5	22.40
STBF-10M-8N	10	1/2	1/2	9.5	25.40	19	17.2	19.5	26.2	33.6	22.40
STBF-12M-4N	12	1/4	1/4	9.5	20.64	22	22.8	22.0	25.9	36.0	22.40
STBF-12M-6N	12	3/8	3/8	9.5	20.64	22	22.8	22.0	25.9	36.0	22.40
STBF-12M-8N	12	1/2	1/2	9.5	25.40	22	22.8	22.0	29.7	40.0	28.40
STBF-16M-8N	16	1/2	1/2	12.7	25.40	25	24.4	22.0	29.7	40.0	28.70

Appendix 11. Detail information of S-LOK tube fittings – SC, Cap

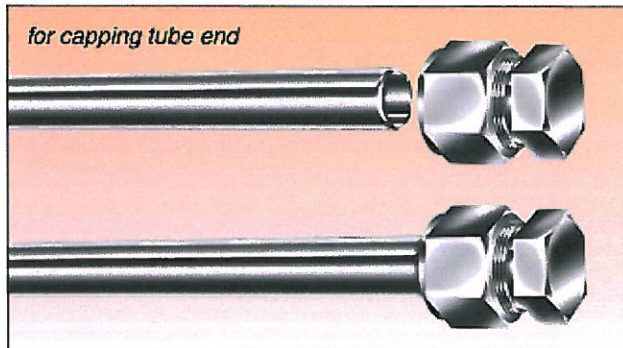


Cap end of fractional tube

Part No.	Tube O.D.		Width across flat				A	B	I	L
	in	mm	h	mm	in	mm				
SC-1	1/16	1.59	5/16	7.93	5/16	7.93	8.63	10.92	11.20	14.18
SC-2	1/8	3.17	7/16	11.11	7/16	11.11	12.70	15.24	13.46	20.06
SC-3	3/16	4.76	7/16	11.11	1/2	12.70	13.71	16.00	14.73	21.33
SC-4	1/4	6.35	1/2	12.70	9/16	14.28	15.24	17.78	16.00	23.26
SC-5	5/16	7.93	9/16	14.28	5/8	15.87	16.25	18.54	17.01	24.38
SC-6	3/8	9.52	5/8	15.87	11/16	17.46	16.76	19.30	18.28	25.65
SC-8	1/2	12.70	13/16	20.63	7/8	22.22	22.86	21.84	19.05	29.21
SC-10	5/8	15.87	15/16	23.81	1	25.40	24.38	21.84	19.81	29.97
SC-12	3/4	19.05	1-1/16	26.98	1-1/8	28.57	24.38	21.84	21.33	31.49
SC-14	7/8	22.22	1-3/16	30.16	1-1/4	31.75	25.90	21.84	23.87	34.03
SC-16	1	25.40	1-3/8	34.92	1-1/2	38.10	31.24	26.41	26.16	38.35
SC-20	1-1/4	31.75	1-3/4	44.45	1-7/8	47.63	41.14	38.86	31.24	53.34
SC-24	1-1/2	38.10	2-1/8	53.98	2-1/4	57.15	50.15	45.21	37.33	64.51
SC-32	2	50.80	2-3/4	69.85	3	76.20	67.56	62.73	49.27	86.61

Installation Instructions

1. Insert the tube end into the Cap
2. With a wrench, 1-1/4 turns from the finger-tight position, (3/4 turn for 1/8", 3/16" 3mm and 4mm)



Cap end of metric tube

Part No.	Tube O.D.		Width across flat				A	B	I	L
	D	mm	h	mm	H	mm				
SC-2M	2	12	12	12.9	15.3	13.5	20.1			
SC-3M	3	12	12	12.9	15.3	13.5	20.1			
SC-4M	4	12	12	13.7	16.1	14.7	21.3			
SC-6M	6	14	14	15.3	17.7	15.7	23.1			
SC-8M	8	15	16	16.2	18.6	17.0	24.5			
SC-10M	10	18	19	17.2	19.5	19.0	26.6			
SC-12M	12	22	22	22.8	22.0	19.0	29.1			
SC-15M	15	24	25	24.4	22.0	19.8	29.9			
SC-16M	16	24	25	24.4	22.0	19.8	29.9			
SC-18M	18	27	30	24.4	22.0	21.3	31.4			
SC-20M	20	30	32	26.0	22.0	23.9	34.0			
SC-22M	22	30	32	26.0	22.0	23.9	34.0			
SC-25M	25	35	38	31.3	26.5	26.2	38.5			
SC-28M	28	41	46	36.6	36.6	27.7	48.5			
SC-32M	32	46	50	42.0	41.6	32.8	55.8			
SC-38M	38	55	60	49.4	47.9	37.8	65.4			