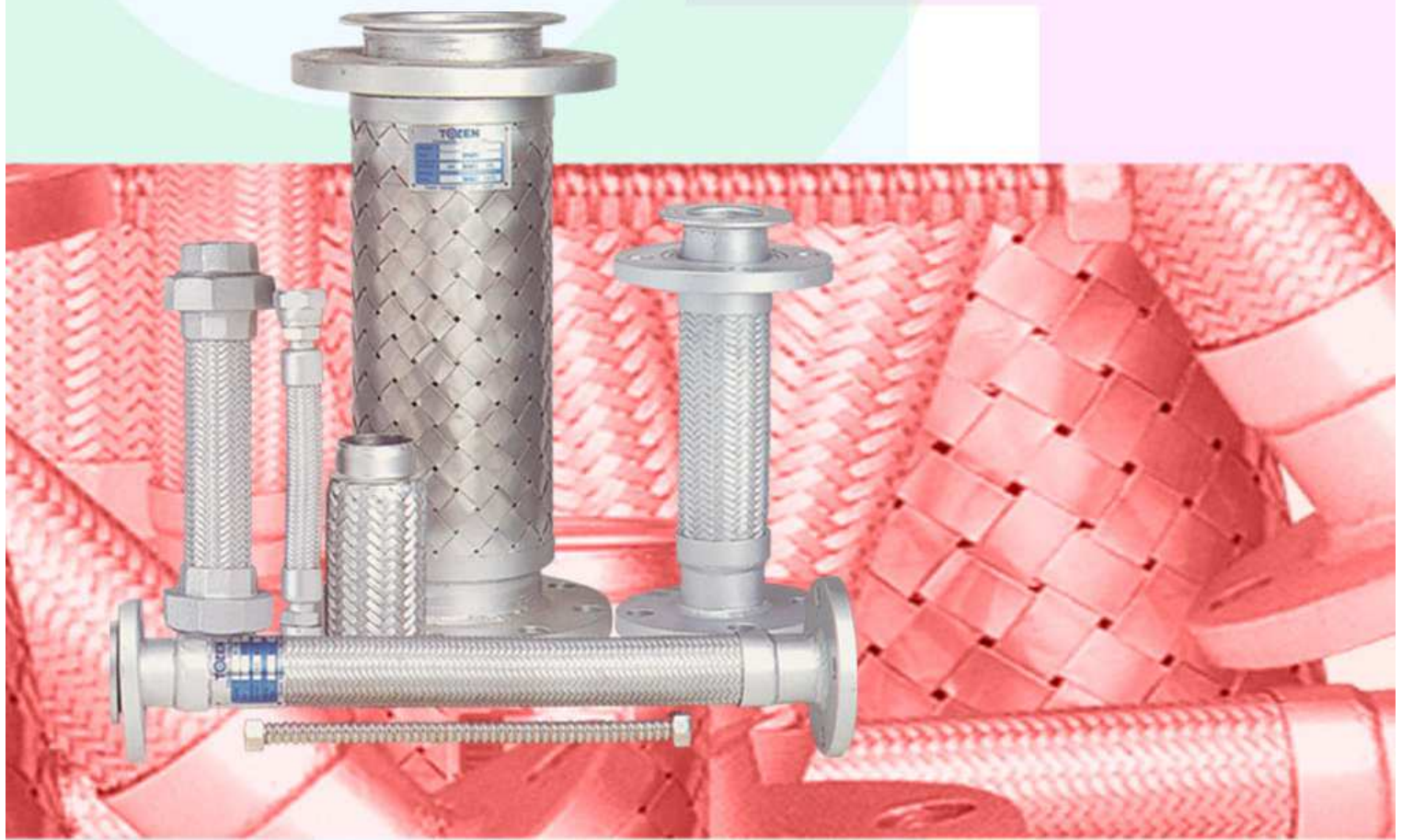
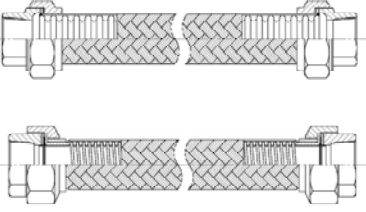
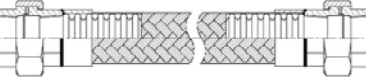
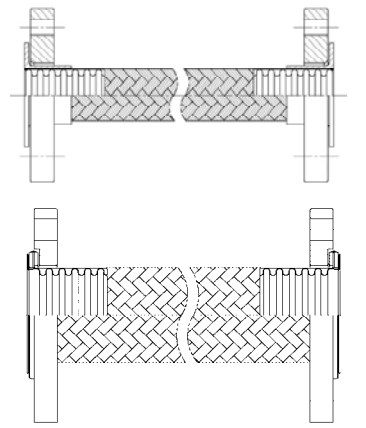
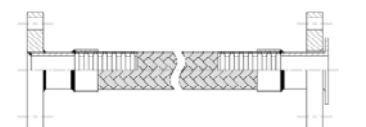
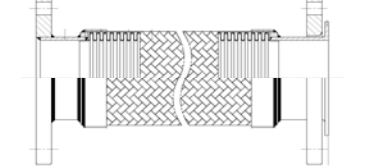


FLEXIBLE HOSE

STAINLESS STEEL FLEXIBLE HOSE



Selection Criteria for Flexible Hose

Type	Construction	Nominal Diameter (A)	Max. Working Temperature °C	Features
SF100		15-50 (Welding Type) 15-50 (Non Welding Type)	200	Both ends union female thread. Material FCMB. Easy piping work and low cost. Standard length: 300mm., 400mm., 500mm.
SF300		15-50	250	Both ends union female thread and suitable for high pressure. Both union material can be selected depending on fluids. (Example: Material of SS400, S25C, SUS304) Standard length: 300mm., 400mm., 500mm.
SF6700		15-100 (Socket Welded Type) 65-300 (Non Welding Type)	250	Both ends loose flange. All contacting fluid parts are stainless steel. Longer effective length enable higher lateral movement.
SF7800		25-400	250	One end fixed and the other loose flange high pressure type for more than 0.98MPa {10kgf/cm ² }. Besides, it can be matched to high pressure inserting steel ring to the waist of tube. Standard length: 300mm., 400mm., 500mm.
SF9800		350-600 And above	250	One end fixed and the other loose flange. Construction of ribbon braid tightened with braid band. Large diameter and suitable for absorption of large movement. Standard length: 800mm., 1000mm., 1200mm.

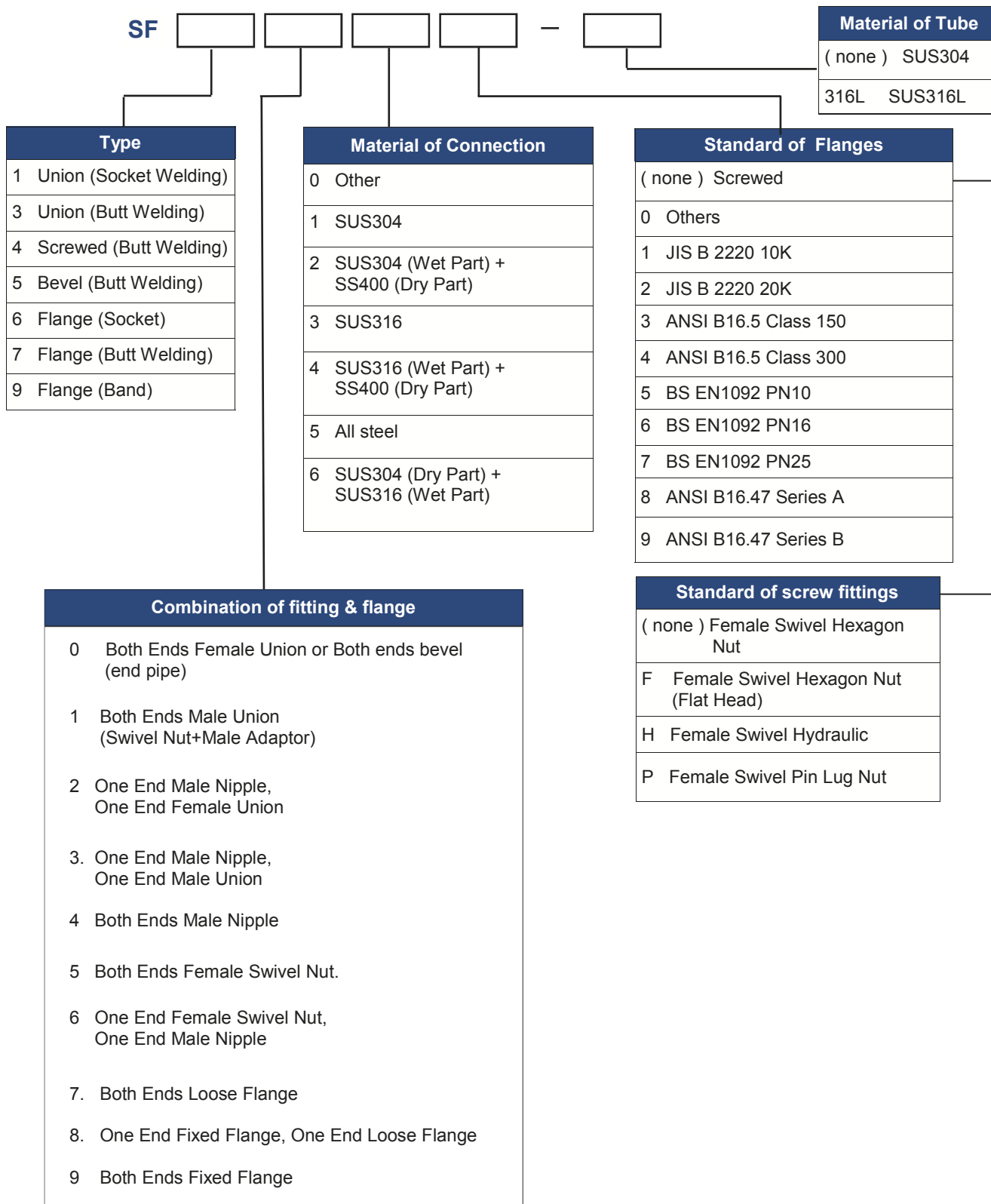
Applicable Fluid:

Oil, Water, Hot Water, Steam, Gas, Air

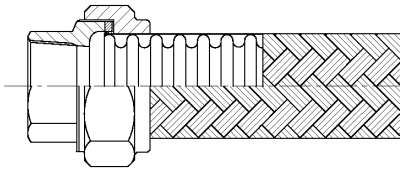
Purpose of Application:

- Making pipe alignment.
- Absorption of pipe thermal deformation.
- Absorption of machine vibration.
- Connection with machine and pipe.
- Prevention for damage of pipe and equipment by ground sinking, earthquake, etc

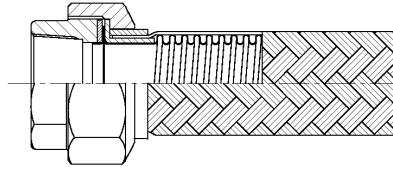
Classification of Stainless Steel Flexible Hose



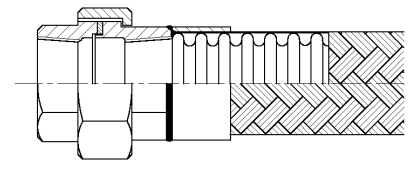
Available Type of Connection



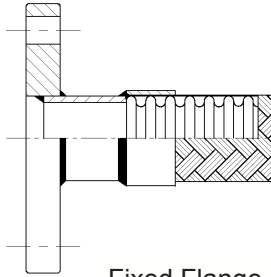
Female Union (Socket Welded)



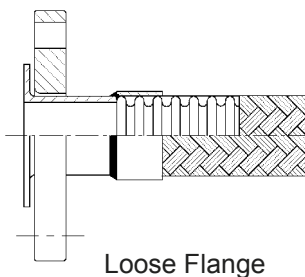
Union (Non Welding)



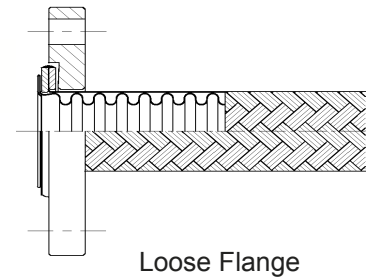
Union (Butt Welded)



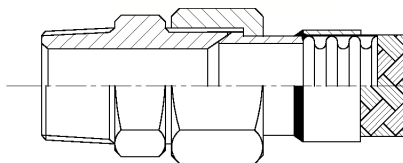
Fixed Flange



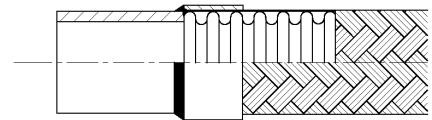
Loose Flange
(Socket Welded)



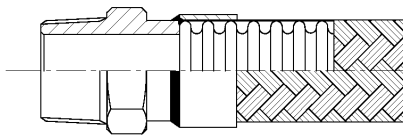
Loose Flange
(Non Welding)



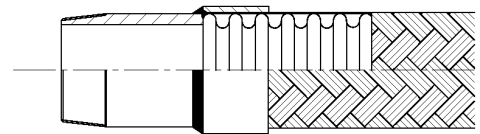
Male Union
(Swivel Nut + Male Adaptor)



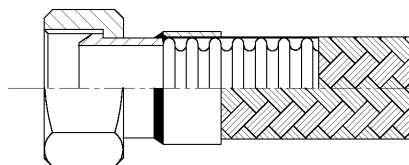
Bevelled End



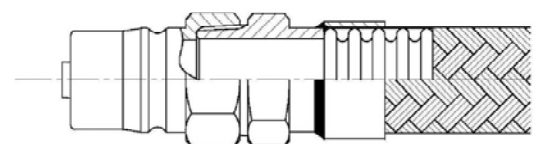
Male Nipple



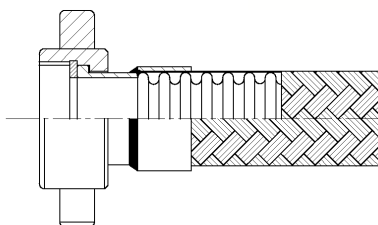
Thread End



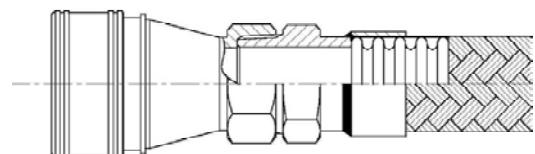
Female Swivel Nut



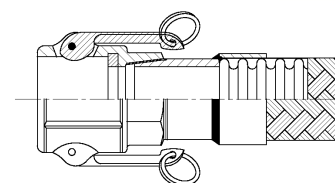
Male Nipple + Quick Release Coupling-Male



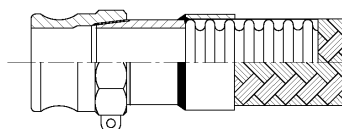
Pinlug Swivel Nut



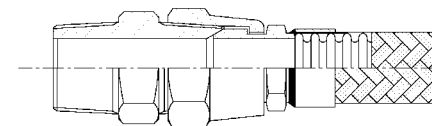
Male Nipple + Quick Release Coupling-Female



Thread End +
Camlock Part D



Thread End +
Camlock Part A



(Male Union)
Hydraulic Fitting

Specification of Stainless Steel Tube

Spiral and Spiral-X Tube (SUS304,SUS316L) with SUS 304 wire braid



- SUS304 (1 Braid) - Minimum pressure rating 20 bars or up

Size A (Inch)	Type code	Type	ID (mm)	OD (mm)	Minimum Bending Radius (mm)	Max. W/P at room temp. (kgf/cm ²)
8A(1/4")	SP-008	Spiral	7.9	10.9	100	145.1
10A(3/8")	SP-010	Spiral	10.8	15.2	150	66.7
15A(1/2")	SP-015	Spiral	13.4	17.1	200	56.4
20A(3/4")	SP-020	Spiral	19.1	25.6	200	27.4
25A(1")	SP-025	Spiral	24.5	32.6	200	26.1
32A (1-1/4")	SP-032	Spiral	32.9	40.6	250	27.5
40A (1-1/2")	SP-040	Spiral	39.3	47.6	250	28.4
50A (2")	SP-050	Spiral	50.8	61.0	350	21.9
50A (2")	SP-050X	Spiral-X	50.8	61.0	350	25.0

Annular Tube (SUS304,SUS316L) with SUS 304 wire braid



- SUS304 (1 Braid) - Minimum pressure rating 10 bars or up

Size A (Inch)	Type code	Type	ID (mm)	OD (mm)	Minimum Bending Radius (mm)	Max. W/P at room temp. (kgf/cm ²)
20A(3/4")	AN-020	Annular	20.0	27.5	200	40.7
25A(1")	AN-025	Annular	25.0	34.0	200	31.8
32A (1-1/4")	AN-032	Annular	32.0	42.5	250	23.4
40A (1-1/2")	AN-040	Annular	40.0	50.5	250	24.9
50A (2")	AN-050	Annular	50.0	62.0	350	18.9
65A (2-1/2")	AN-065	Annular	65.0	77.0	410	19.5
80A (3")	AN-080	Annular	78.0	93.0	450	12.0
100A (4")	AN-100	Annular	100.0	116.5	560	10.0
125A (5")	AN-125	Annular	125.0	146.7	660	10.1
150A (6")	AN-150	Annular	150.0	177.0	815	10.1
200A (8")	AN-200	Annular	200.0	232.7	1015	10.0
250A (10")	AN-250	Annular	250.0	290.0	1220	10.4
300A (12")	AN-300	Annular	300.0	340.0	1420	10.5
350A (14")	AN-350	Annular	350.0	390.0	n/a	10.5
400A (16")	AN-400	Annular	400.0	440.0	n/a	10.5

Hose specification will change without noticed

Specification of Stainless Steel Tube

Annular-S Tube (SUS304,SUS316L) with SUS 304 wire braid

- SUS304 (1 Braid) - Minimum pressure rating 16 bars or up



Size A (Inch)	Type code	Type	ID (mm)	OD (mm)	Minimum Bending Radius (mm)	Max. W/P at room temp. (kgf/cm ²)
80A (3")	AN-080S	Annular-S	77.9	93.0	450	16.6
100A (4")	AN-100S	Annular-S	99.9	116.5	560	18.4
125A (5")	AN-125S	Annular-S	124.8	151.1	660	16.0
150A (6")	AN-150S	Annular-S	150.0	177.0	815	16.5
200A (8")	AN-200S	Annular-S	200.0	234.7	1015	16.0
250A (10")	AN-250S	Annular-S	250.0	285.0	1220	16.0
300A (12")	AN-300S	Annular-S	300.0	340.0	1420	16.2
350A (14")	AN-350S	Annular-S	349.8	389.8	n/a	16.4
400A (16")	AN-400S	Annular-S	400.0	440.0	n/a	16.5

Annular-X Tube (SUS304,SUS316L) with SUS 304 wire braid

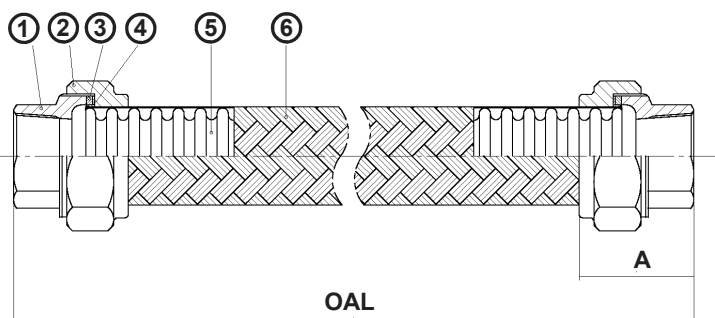
- SUS304 (1 Braid) - Minimum pressure rating 25 bars or up



Size A (Inch)	Type code	Type	ID (mm)	OD (mm)	Minimum Bending Radius (mm)	Max. W/P at room temp. (kgf/cm ²)
65A (2-1/2")	AN-065X	Annular-X	65.0	77.0	410	25.2
80A (3")	AN-080X	Annular-X	77.8	93.0	450	27.2
100A (4")	AN-100X	Annular-X	99.8	116.5	560	28.0
125A (5")	AN-125X	Annular-X	124.6	152.3	660	26.3
150A (6")	AN-150X	Annular-X	150.0	177.0	815	25.0
200A (8")	AN-200X	Annular-X	199.5	235.2	1015	25.0
250A (10")	AN-250X	Annular-X	250.0	285.4	1220	25.0
300A (12")	AN-300X	Annular-X	300.0	335.6	1420	25.0

Hose specification will change without noticed

SF100 Union Type Flexible Hose (Welding Type)



No.	Parts	Materials
1	Union End	FCMB
2	Union Nut	FCMB
3	Gasket	Non Asbestos
4	Union Ring	SUS304
5	Flexible Tube	SUS304
6	Wire Braid	SUS304

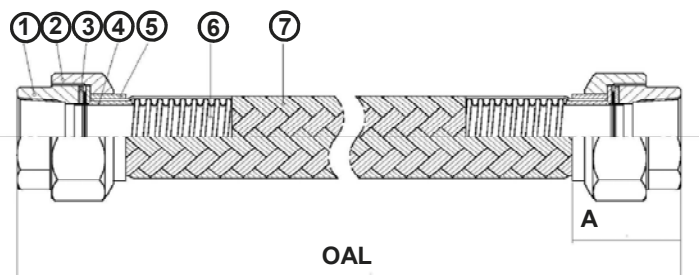
Max Working Temperature : 200°C
(For higher temperature, please consult us)

SUS 304/SUS316L also available upon requested
Max Working Pressure : 25 bars

Nominal Diameter A (Inch)	Thread Rc (Inch)	Min.Bending Radius (mm)	Overall Length			Ineffective Length Ax2 (mm)
			300mm	400mm	500mm	
			Lateral Movement (mm)			
15A (1/2")	1/2	200	43	85	138	70
20A (3/4")	3/4	200	37	78	130	85
25A (1")	1	200	36	75	127	90
32A (1.1/4")	1.1/4	250	26	58	100	100
40A (1.1/2")	1.1/2	250	24	54	95	110
50A (2")	2	350	15	37	67	120

Size 50A used spiral-X hose

SF100 NW Union Type Flexible Hose (Non Welding)



No.	Parts	Materials
1	Union End	FCMB
2	Union Nut	FCMB
3	Union Gasket	Non Asbestos
4	Lap Ring	SS400
5	Collar	SS400
6	Flexible Tube	SUS304,SUS316L
7	Wire Braid	SUS304

Max Working Temperature : 200°C
(For higher temperature, please consult us)

Max Working Pressure : 16bars

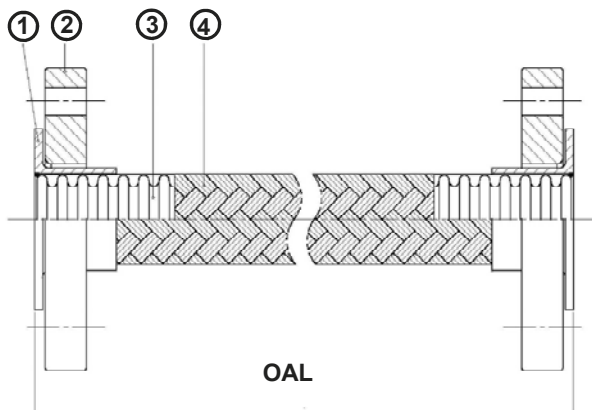
Nominal Diameter A (Inch)	Thread Rc (Inch)	Min.Bending Radius (mm)	Overall Length			Ineffective Length Ax2 (mm)
			300mm	400mm	500mm	
			Lateral Movement (mm)			
15A (1/2")	1/2	200	41	83	136	74
20A (3/4")	3/4	200	41	83	136	74
25A (1")	1	200	37	77	129	86
32A (1.1/4")	1.1/4	250	28	60	103	94
40A (1.1/2")	1.1/2	250	26	58	100	99
50A (2")	2	350	17	39	70	110

Applicable fluid
Working pressure
Standard test pressure
Bursting pressure

Oil, Water, Hot Water, Steam, Gas, Air
Please refer to spiral & annular tube and fitting.
1.5 Times of working pressure
4 Times of working pressure

SF 6700 Series Stainless Steel Flexible Hose (Contacting Fluid All Stainless Steel)

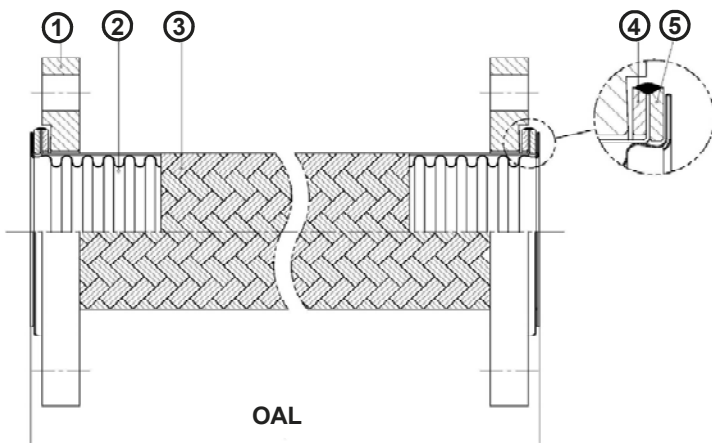
For 15A-100A (SW Type)



SF67X1, FLANGE JIS10K
 SF67X2, FLANGE JIS20K
 SF67X3, FLANGE ANSI150
 SF67X4, FLANGE ANSI 300
 SF67X5, FLANGE PN10
 SF67X6, FLANGE PN16
 SF67X7, FLANGE PN25

No.	Parts	Materials
1	Lap Ring	SUS304
2	Loose Flange	SS400 (Zinc-plate)
3	Flexible Tube	SUS304, SUS316L
4	Wire Braid	SUS304

For 65A-300A (NW Type)



No.	Parts	Materials
1	Non Welding Flange	SS400 (Zinc-Plated)
2	Flexible tube	SUS304 or SUS316L
3	Wire braid	SUS 304
4	Back rings	SS400 (NickelPlated)
5	Front rings	SS400 (NickelPlated)

Max Working Temperature : 250°C
 Max working pressure: 25 bars

Type	Nominal Diameter A (Inch)	Min bending radius (mm)	Max static Lateral Movement			Ineffective Length (mm)
			300mm OAL	400mm OAL	500mm OAL	
SW	15A(1/2")	200	56	102	158	36
	20A(3/4")	200	56	102	158	36
	25A(1")	200	56	102	158	36
	32A(1.1/4")	250	44	82	130	40
	40A(1.1/2")	250	43	81	129	41
	50A(2")	350	31	60	96	41
	65A(2.1/2")	410	25	49	80	50
	80A(3")	450	22	44	72	54
NW	100A(4")	560	18	35	58	54
	65A(2.1/2")	410	24	48	78	58
	80A(3")	450	22	43	71	58
	100A(4")	560	17	34	57	58
	125A(5")	660	15	29	49	58
	150A(6")	815	12	23	39	61
	200A(8")	1015	9	18	31	67
	250A(10")	1220	7	15	25	71
	300A(12")	1420	6	12	21	74

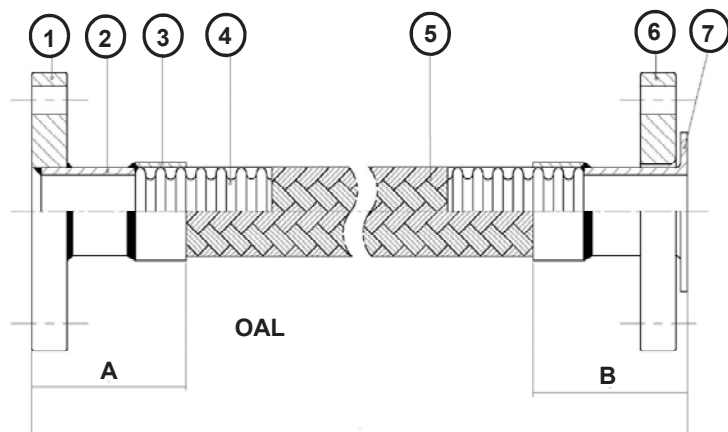
- Protect Galvanic Corrosion of contacting fluid steel parts.

Applicable fluid
 Limited Working pressure
 Standard test pressure
 Bursting pressure

Oil, Water, Hot Water, Steam, Gas, Air
 Limited of flange and hose rating
 1.5 times of working pressure
 4 times of working pressure

Noted: SF6700 have more lateral movement than 7800 & 7700 for the same size and total length.

SF 7700 & 7800 Series Flange Type Flexible Hose (Wire Braid Type)



SF77X1, SF78X1 FLANGE JIS10K
 SF77X2, SF78X2 FLANGE JIS20K
 SF77X3, SF78X3 FLANGE ANSI150
 SF77X4, SF78X4 FLANGE ANSI 300
 SF77X5, SF78X5 FLANGE PN10
 SF77X6, SF78X6 FLANGE PN16
 SF77X7, SF78X7 FLANGE PN25

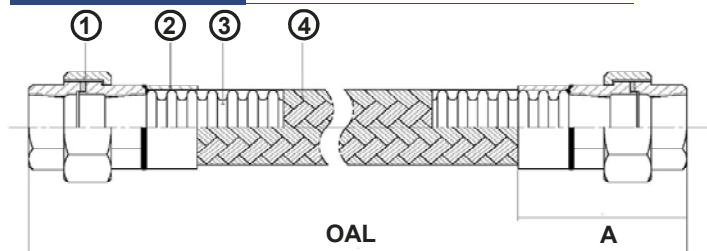
No.	Part	Material
1	Fixed Flange	SS400, SUS304
2	Short Pipe	SS400, SUS304
3	Collar	SUS304
4	Flexible Tube	SUS304
5	Wire Braid	SUS304
6	Loose Flange	SS400,SUS304
7	Lap Joint / Stub End	CS,SUS304

Max Working Temperature : 250°C
 Max working pressure: 25 bars
 (16 bar for size 350A-400A)

Nominal Diameter A (Inch)	Min. Bending Radius (mm)	Overall Length			Ineffective Length A + B (mm)
		300mm	400mm	500mm	
		Eccentric (mm)			
25A (1")	200	20	52	97	145
32A (1.1/4")	250	13	38	74	159
40A (1.1/2")	250	10	33	67	175
50A (2")	350	7	24	49	175
65A (2.1/2")	410	6	20	42	175
80A (3")	450	4	15	34	195
100A (4")	560	3	12	27	195
125A (5")	660	3	11	23	195
150A (6")	815	2	8	18	200
200A (8")	1015	1	5	13	220
250A (10")	1220	-	4	11	220
300A (12")	1420	-	4	9	220

Precaution : "The use of mild steel lap joint and pipe collar in water system may cause galvanic corrosion a severe corrosion on the base metal and cause leakage in very short period. The joint with all stainless steel wet parts is strongly recommended."

SF300 Series Union Type Flexible Hose



No.	Part	Material
1	Female Union	SUS304 ,SS400,S25C
2	Collar	SUS304
3	Flexible Tube	SUS304
4	Wire Braid	SUS304

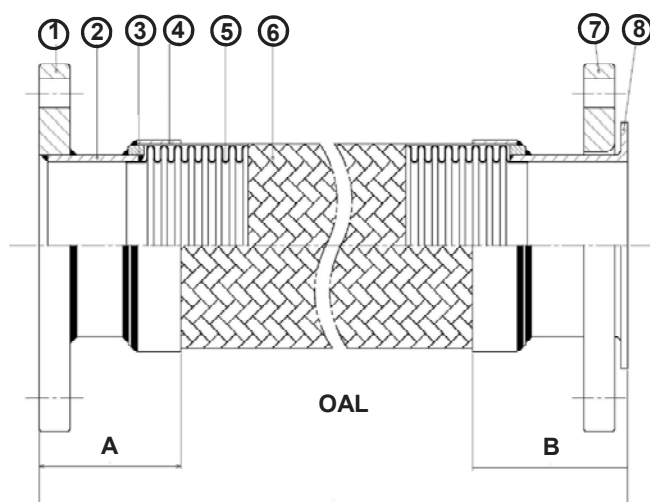
Max Working Temperature : 250°C

Max working pressure: 25 bars

Nominal Diameter A (Inch)	Min. Bending Radius (mm)	Overall Length			Ineffective Length A x 2 (mm)
		300mm	400mm	500mm	
		Eccentric (mm)			
15A (1/2")	200	28	65	113	114
20A (3/4")	200	21	55	101	138
25A (1")	200	17	47	91	158
32A (1.1/4")	250	9	30	64	184
40A (1.1/2")	250	6	25	56	206
50A (2")	350	3	15	37	220

SF 9800 Series Flange Type Flexible Hose (Ribbon Braid Type)

SF98X1- FLANGE JIS10K
SF98X3- FLANGE ANSI150



No.	Parts	Materials
1	Fixed Flanges	SS400, SUS304
2	Short pipe	SS400, SUS304
3	Band	SS400,SUS304
4	Collar	SUS304
5	Flexible Tube	SUS304
6	Ribbon Braid	SUS304
7	Loose Flange	SS400,SUS304
8	Lap Joint / Stub End	SS400.SUS304

Max. Working Temperature : 250°C

Max working pressure: 150 PSI (10 bars)

* Please consult us for bigger size

Nominal Diameter A (Inch)	Min.Bending Radius (mm)	Overall Length			Ineffective Length A x B (mm)
		800mm	1000mm	1200mm	
		Eccentric (mm)			
350A(14")	1680	17	32	52	280
400A(16")	1900	14	26	43	280
450A(18")	2000	13	30	53	400
500A(20")	2200	12	27	48	400
600A(24")	2400	11	25	44	400

Applicable Fluid
Limited Working pressure
Standard test pressure
Bursting pressure

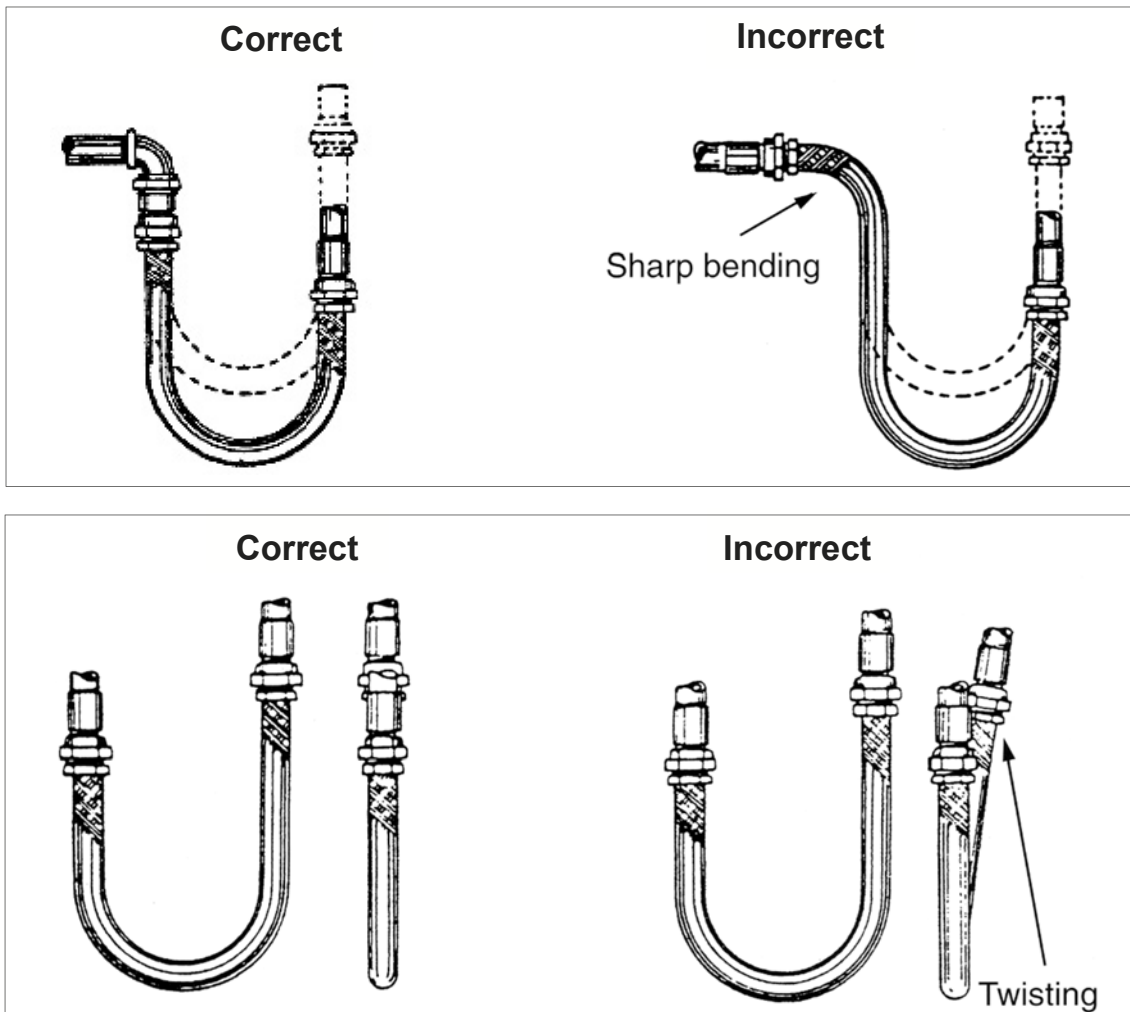
Oil, Water,Hot Water,Steam, Gas,Air
Limited of flange and hose rating
1.5 Times of working pressure
4 Times of working pressure

Precaution in Piping Method

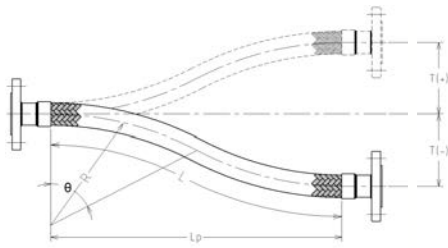
To make flexible hoses function properly and last longer, the followings are guides to correct installation.

- Metal flexible hoses should not be bent to a radius smaller than recommended in their specifications, otherwise fatigue and premature failure will occur.
- Avoid twisting of metal flexible hoses.
- Always install metal flexible hoses so that movement originates in the same plane as the centerline.

1 Proper Flexible Hose Installation



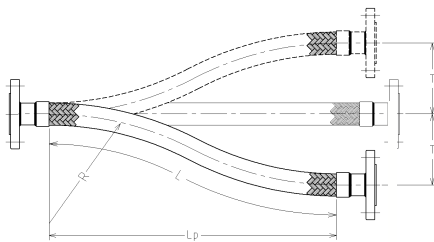
2 Calculation for Hose Length (L) with Movement



1. Lateral offset Movement

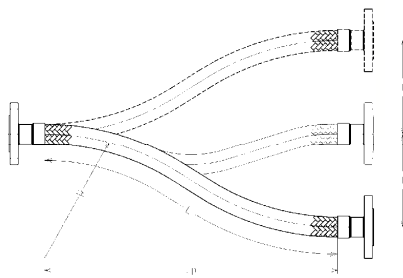
1.1 Max. offset distance by geometric calculation

$$\begin{aligned} \text{Bend Angle } \theta &= 28.65 \text{ L/R} \\ T &= 2R(1\cos \theta) \\ L_p &= 2R \sin \theta \end{aligned}$$



1.2. Recommended Length (L) for offset movement (Static with one end free)

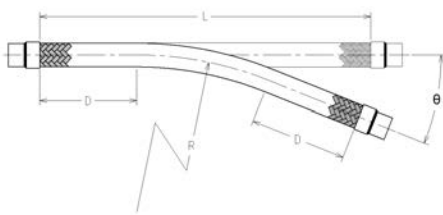
$$\begin{aligned} L &= \sqrt{6(RT) + T^2} \\ L_p &= \sqrt{L^2 - T^2} \end{aligned}$$



1.3 Recommend Length (L) for offset movement (Static with both end fixed)

$$\begin{aligned} L &= \sqrt{20(RT)} \\ L_p &= \sqrt{L^2 - T^2} \end{aligned}$$

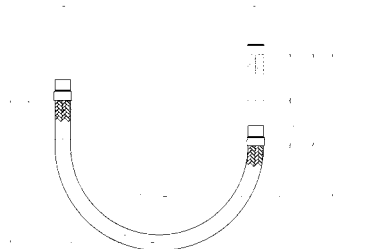
(For repeatedly or dynamic movement “T” should not exceed 25% of “R”)



2. Angular Movement

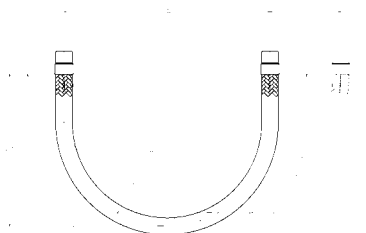
$$L = 2D + (\theta/57.3)R$$

3. U-Loop arrangement



3.1 Traveling Loop “A”

$$\begin{aligned} L &= 4R + 0.5T \\ K &= 1.43R + 0.5T \end{aligned}$$

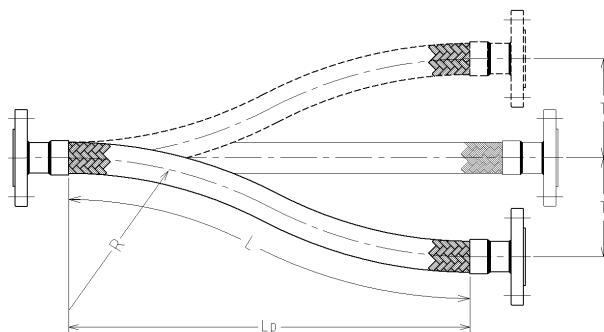


3.2 Travelling Loop “B”

$$\begin{aligned} L &= 4R + 1.57T \\ K1 &= 1.43R + 0.785T \\ K2 &= 1.43R + 0.5T \end{aligned}$$

Recommend Effective Length for Lateral offset Movement

Static application 1: with one end free or allowed to pull in

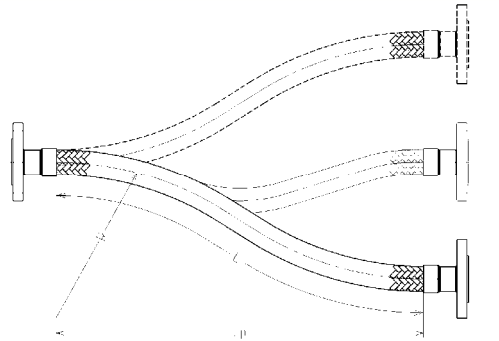


Nominal Diameter A (B)	Minimum Bending Radius (mm)	Lateral Movement in mm (T)									
		25	50	75	100	150	200	250	300	400	500
8A (1/8")	100	125	180	225	265	335	437	546	655	874	1092
10A (3/8")	150	152	218	270	316	397	469	546	655	874	1092
15A (1/2")	200	175	250	309	361	450	529	602	671	874	1092
20A (3/4")	200	175	250	309	361	450	529	602	671	874	1092
25A (1")	200	175	250	309	361	450	529	602	671	874	1092
32A (1-1/4")	250	195	278	344	400	497	583	661	735	874	1092
40A(1-1/2")	250	195	278	344	400	497	583	661	735	874	1092
50A (2")	350	230	328	404	469	581	678	766	849	1000	1140
65A (2-1/2")	410	249	354	436	506	626	729	823	910	1070	1217
80A (3")	450	261	371	456	529	654	762	859	949	1114	1265
100A (4")	560	291	413	508	588	726	844	950	1048	1226	1389
125A (5")	660	316	448	550	637	785	912	1026	1130	1321	1493
150A (6")	815	351	497	610	706	869	1009	1134	1248	1455	1642
200A (8")	1015	391	554	680	787	967	1122	1259	1385	1611	1815
250A (10")	1220	429	607	745	861	1059	1226	1376	1512	1757	1977
300A (12")	1420	462	655	803	928	1140	1321	1481	1627	1889	2124

- Figures in blue color cells are limited for static movement
- Figures in bold fonts are adjusted with length retraction below 10%

Recommend Effective Length for Lateral offset Movement

Static application 2: Crowded position with both end fixed and not allowed to move in



Nominal Diameter A (B)	Minimum Bending Radius (mm)	Lateral Movement in mm (T)									
		25	50	75	100	150	200	250	300	400	500
8A (1/8")	100	224	316	387	447	610	812	1014	1217	1623	2028
10A (3/8")	150	274	387	474	548	671	812	1014	1217	1623	2028
15A (1/2")	200	316	447	548	632	775	894	1000	1217	1623	2028
20A (3/4")	200	316	447	548	632	775	894	1000	1217	1623	2028
25A (1")	200	316	447	548	632	775	894	1000	1217	1623	2028
32A (1-1/4")	250	354	500	612	707	866	1000	1118	1225	1623	2028
40A(1-1/2")	250	354	500	612	707	866	1000	1118	1225	1623	2028
50A (2")	350	418	592	725	837	1025	1183	1323	1449	1673	2028
65A (2-1/2")	410	453	640	784	906	1109	1281	1432	1568	1811	2028
80A (3")	450	474	671	822	949	1162	1342	1500	1643	1897	2121
100A (4")	560	529	748	917	1058	1296	1497	1673	1833	2117	2366
125A (5")	660	574	812	995	1149	1407	1625	1817	1990	2298	2569
150A (6")	815	638	903	1106	1277	1564	1806	2019	2211	2553	2855
200A (8")	1015	712	1007	1234	1425	1745	2015	2253	2468	2850	3186
250A (10")	1220	781	1105	1353	1562	1913	2209	2470	2706	3124	3493
300A (12")	1420	843	1192	1459	1685	2064	2383	2665	2919	3370	3768

- Figures in blue color cells are limited for static movement
- Figures in bold fonts are adjusted with length elongation below 3%



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