

Global Flex Mfg.

1580 Charles Drive Redding, CA 96003

METAL HOSE PRODUCT LINE

SN SERIES

The standard of the industry when a Type 321 or 316 stainless steel hose is required, *SN* is constructed with a close-pitch “omega” design annular corrugation to provide a high degree of flexibility and long life, available in lengths up to fifty feet, depending on diameter.

BN SERIES

Designed specifically as flexible connections in bronze or copper lines, *BN* is built with bronze, butt-welded, close pitch corrugated hose, covered with bronze braid. Available in sized ¼ up to 4”

UN SERIES

UN is the most flexible metal hose available anywhere. The unique hydro-formed annular hose construction provides unequalled cycle life. *UN* is the only ISO 10380 approved hose in the world – far surpassing international standards for cycle life and reliability. Available in Type 321 or 316 stainless steel.

UNHP SERIES

When a higher-pressure metal hose is required, *UNHP* will provide ultra high-pressure resistance and much better flexibility than other high-pressure hoses. *UNHP* is constructed with a Type 316 stainless steel, hydro-formed convoluted hose 321 & 316 stainless steel with series 300 stainless steel braids.

GF SERIES

The Global-Flex line of interlocked hose is available in most stainless steel alloys, aluminum, bronze, brass, aluminized, galvanized, and tin plate. Various packings are available to withstand high pressures and temperature extremes. A complete assortment of fittings, flanges, and couplers are also available.

Global-Flex Mfg.

1580 Charles Drive Redding, CA 96003

MATERIAL:

Hose: 321 or 316 stainless steel

Braid: 300 series stainless steel

Pressure applications:

Full vacuum to working pressures listed below.

Style SN Data Sheet

CONSTRUCTION:

Annular butt-welded, mechanically formed close pitch corrugated hose.

USN – UNBRAIDED HOSE

SN – SINGLE BRAIDED HOSE

DSN – DOUBLE BRAIDED HOSE

NOMINAL DIAMETER (INCHES)	ACTUAL ID (INCHES)	NUMBER OF BRAIDS	NOMINAL OD (INCHES)	STATIC		DYNAMIC		BURST PRESSURE @ 70° F. (PSIG)	WEIGHT PER FOOT (POUNDS)
				MINIMUM BEND RADIUS (INCHES)	MAXIMUM WORKING PRESSURE @ 70° F (PSIG)	MINIMUM BEND RADIUS (INCHES)	MAXIMUM WORKING PRESSURE @ 70° F. (PSIG)		
1/4	0.32	0	.46	4	140	6	140	9500	0.09
		1	.51		2375		2375		0.18
		2	.56		3125		3125		0.27
3/8	0.42	0	.61	2	100	4	100	6600	0.12
		1	.67		1650		1650		0.23
		2	.73		2200		2200		0.35
1/2	0.52	0	.76	3	75	5	75	4400	0.16
		1	.81		1100		1100		0.26
		2	.87		1625		1625		0.37
3/4	0.81	0	1.05	4	43	6	43	3200	0.26
		1	1.10		898		898		0.43
		2	1.16		1347		1347		0.62
1	1.03	0	1.34	4.5	43	7	43	3000	0.36
		1	1.42		718		718		0.62
		2	1.50		1077		1077		0.91
1-1/4	1.30	0	1.64	4	43	11	43	2900	0.45
		1	1.72		645		645		0.82
		2	1.80		968		968		0.23
1-1/2	1.53	0	1.88	4.5	28	12	28	2260	0.48
		1	1.95		531		531		0.82
		2	2.02		797		797		1.23
2	2.50	0	2.48	5	14	13	14	2000	0.70
		1	2.58		449		449		1.38
		2	2.69		674		674		2.14
2-1/2	2.61	0	3.33	5	12	16	18	1600	1.28
		1	3.45		400		400		2.09
		2	3.57		600		600		2.98
3	3.10	0	3.89	7.5	8	18	8	1150	1.53
		1	4.01		288		288		2.39
		2	4.13		431		431		3.35
4	3.98	0	4.83	10	5	22	5	1000	1.95
		1	5.03		250		250		3.14
		2	5.23		375		375		4.46
5	5.03	0	5.94	12	3.5	28	3.5	800	2.76
		1	6.10		200		200		4.08
		2	6.14		245		245		5.53
6	5.98	0	6.95	15	3	32	3	700	3.34
		1	7.15		175		175		4.79
		2	7.35		225		225		6.39
8	7.96	0	9.08	20	2.7	42	2.7	850	5.32
		1	9.44		212		212		8.73
		2	9.80		230		230		12.14
10	9.78	0	11.10	25	2.2	56	2.2	700	8.71
		1	11.49		175		175		12.65
		2	11.88		200		200		16.59
12	11.76	0	13.22	30	1.8	58	1.8	640	11.58
		1	13.51		160		160		17.53
		2	13.80		188		188		23.48

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MATERIAL:

Hose: 321 or 316 stainless steel

Braid: 300 series stainless steel

Style BN Data Sheet

CONSTRUCTION:

Annular butt-welded, mechanically formed close pitch corrugated hose.

Pressure applications:

Full vacuum to working pressures listed below.

UBN – UNBRAIDED HOSE

BN – SINGLE BRAIDED HOSE

DBN – DOUBLE BRAIDED HOSE

Nominal Diameter (Inches)	Actual ID (MM)	Number of Braids	Nominal OD (Inches)	STATIC		DYNAMIC		Burst Pressure @ 70° F (PSIG)	Weight Per Foot (Pounds)
				Minimum Bend Radius (Inches)	Maximum Working Pressure @ 70° F (PSIG)	Minimum Bend Radius (Inches)	Maximum Working Pressure @ 70° F (PSIG)		
1/4"	.25	0	.49	1.0	100	5.50	100	4,142	.13
		1	.57		1,035		1,035		.23
		2	.65		1,656		1,656		.33
3/8	.38	0	.67	1.25	40	6.00	40	2,738	.25
		1	.75		685		685		.36
		2	.83		1,095		1,095		.47
1/2	.50	0	.82	1.50	40	7.00	40	2,825	.38
		1	.90		706		706		.57
		2	.98		1,130		1,130		.76
3/4	.75	0	1.21	2.25	30	8.00	30	2,307	.50
		1	1.31		577		577		.83
		2	1.41		923		923		1.16
1	1.0	0	1.51	3.00	20	10.00	20	1,881	.68
		1	1.61		470		470		1.12
		2	1.71		752		752		1.56
1-1/4	1.25	0	1.85	3.50	15	12.00	15	1,443	.80
		1	1.95		361		361		1.31
		2	2.05		577		577		1.82
1-1/2	1.50	0	2.18	4.00	10	13.50	10	1,317	1.03
		1	2.31		329		329		1.73
		2	2.43		526		526		2.43
2	2.0	0	2.50	5.00	8	17.0	8	1,267	1.81
		1	2.63		317		317		2.73
		2	2.75		507		507		3.65
2-1/2	2.5	0	3.18	8.00	8	22.00	8	1,090	1.39
		1	3.31		272		272		2.66
		2	3.43		435		435		3.93
3	3.0	0	3.65	12.00	10	24.00	10	805	1.44
		1	3.78		201		201		2.84
		2	3.91		322		322		4.11
4	4.0	0	4.81	14.00	8	26.00	8	568	3.45
		1	4.94		142		142		5.03
		2	5.06		227		227		6.61

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Style UN Data Sheet

MATERIAL:

Hose: 321 or 316 Stainless Steel

Braid: 300 Series Stainless Steel

CONSTRUCTION:

Annular butt-welded, hydro-formed close pitch corrugated hose

CHARACTERISTICS:

Extremely flexible – ISO 10380 conformance, 50,000 cycle rated and pressure rated as per ISO 10380. Available in long lengths on reels.

UN20 - UNBRAIDED HOSE

UN21 - SINGLE BRAIDED HOSE

UN22- DOUBLE BRAIDED HOSE

* Contact Global-Flex for Specifications

Nominal Diameter (Inches)	Actual ID (MM)	Number of Braids	Nominal OD (Inches)	STATIC		DYNAMIC		Burst Pressure @ 70° F (PSIG)	Weight Per Foot (Pounds)
				Minimum Bend Radius (Inches)	Maximum Working Pressure @ 70° F (PSIG)	Minimum Bend Radius (Inches)	Maximum Working Pressure @ 70° F (PSIG)		
1/4"	6	0	.39	.35	392	5.50	2,030	11,165	.04
		1	.45	.75	4,829				
3/8	10	0	.63	.55	174	6.00	1,450	8,004	.23
		1	.70	1.14	3,727				
1/2	12	0	.73	.83	131	4.88	1,160	6,104	.10
		1	.79	1.34	2,973				
3/4	20	0	1.11	1.26	32	6.65	725	3,509	.15
		1	1.18	2.09	1,421				
1	25	0	1.37	1.46	26	7.68	580	2,755	.20
		1	1.43	2.52	972				
1-1/4	32	0	1.71	1.81	22	8.86	580	2,973	.33
		1	1.79	3.11	1,131				
1-1/2	40	0	2.06	2.16	17	10.04	465	2,465	.40
		1	2.14	3.86	885				
2	50	0	2.55	2.56	13	11.54	465	2,436	.64
		1	2.65	4.72	928				
2-1/2	65	0	3.19	3.15	10	13.58	363	1,871	.79
		1	3.28	5.90	623				
3	80	0	3.81	3.82	9	15.35	290	1,595	.94
		1	3.93	7.09	522				
4	100	0	4.63	4.45	7	17.72	218	1,247	1.12
		1	4.74	8.58	406				
5	125	0	5.98	5.20	6	25.60	232	928	3.04
		1	6.10	10.04	276				
6	150	0	6.85	5.98	4	32.08	210	841	3.48
		1	6.97	11.42	232				

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UNHP Data Sheet

MATERIAL:

Hose: 316L Stainless Steel

Braid: 300 Series Stainless Steel

CONSTRUCTION:

Butt-welded, hydro-formed, heavy wall compressed hose with double braid

CHARACTERISTICS:

Ultra high-pressure hose for the most demanding pressure and flexing conditions.

UNHP:

Double braided hose

Nominal Diameter (Inch)	Actual ID (MN)	Number Of Braids	Nominal OD (Inch)	Minimum Static Bend Radius (Inches)	Minimum Dynamic Bend Radius (Inches)	Maximum Working Pressure @ 70° F (PSIG)	Burst Pressure @ 70° F (PSIG)	Weight Per Foot (Pounds)
1/4	6	2	.51	2.80	5.20	3,988	15,950	.21
3/8	10	2	.76	3.00	5.50	3,117	12,470	.39
1/2	12	2	.86	4.00	7.10	3,165	12,658	.49
3/4	20	2	1/21	5.20	7.50	2,066	8,265	.74
1	25	2	1.57	6.70	9.00	2,004	8,018	1.23
1-1/4	32	2	1.93	7.50	10.00	1,653	6,612	1.68
1-1/2	40	2	2.26	8.50	12.80	1,334	5,336	2.08
2	50	2	2.75	10.80	16.00	1,294	5,176	2.82

Contact Global-Flex Mfg. for maximum test pressures

Global-Flex Mfg.

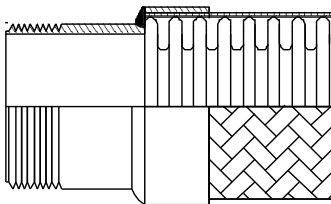
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FITTINGS

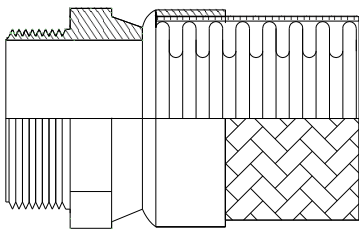
Various fittings can be attached to metal hose. The fittings can be made of any material compatible with the hose and the media. Some of the most common ones are illustrated below.

Male Pipe Thread

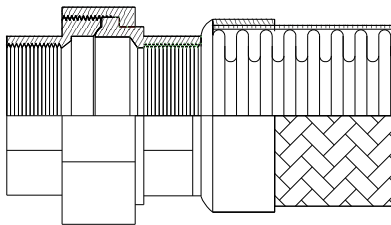
Plain Nipples



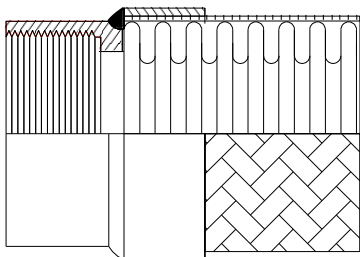
Male Pipe Hex



Female Union

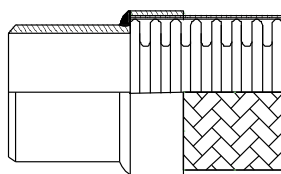


Half Coupling

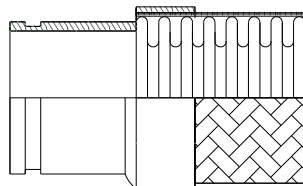


Plain Weld Nipples

Beveled For Welding

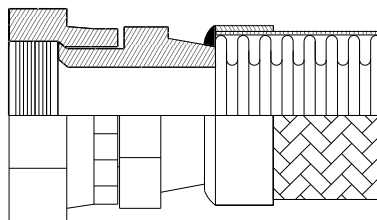


Grooved End



AN 818 Or J.I.C.

Female Swivel
And
Other Tube Fittings



Other Fittings:

Cam Lock Quick Disconnect
Elbows Socket Weld
Flanged Union Tees
Hydraulic

Stub Ends With Floating Flanges

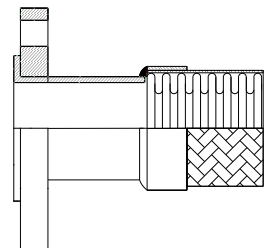
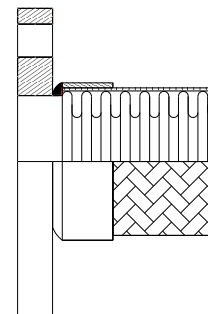
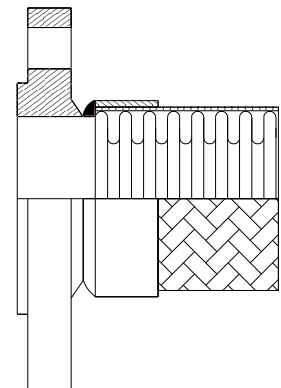


Plate Class D Fixed



Slip-On Raised Face 150,
300,600 lb Drilling



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SPECIAL HOSE ASSEMBLIES *FABRICATION*

JACKETED ASSEMBLY

Jacketed Assemblies are normally used in one of the following applications:

1. As a heated transfer line for those products such as sulphur, which must be maintained at an elevated temperature in order to flow readily. Steam or hot oil is circulated through the jacket, which in turn heats the products being conveyed in the core hose.
2. As a cryogenic transfer line. Maintaining a high vacuum in the jacket effectively insulates cryogenic liquids being conveyed in the core hose.

TRACED ASSEMBLY

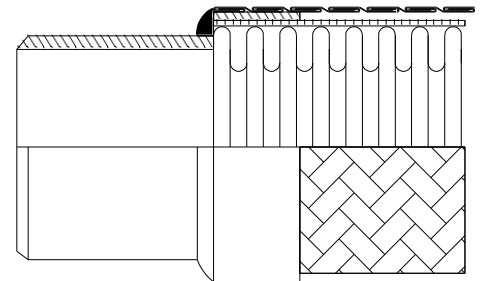
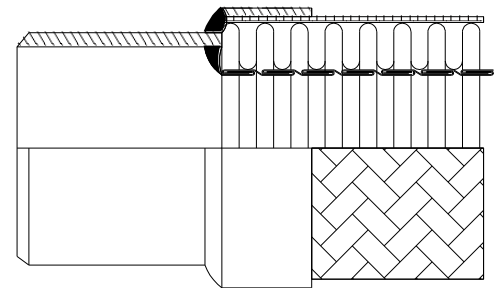
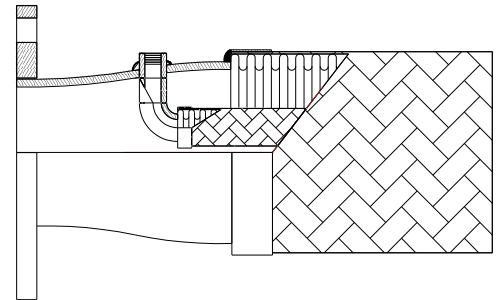
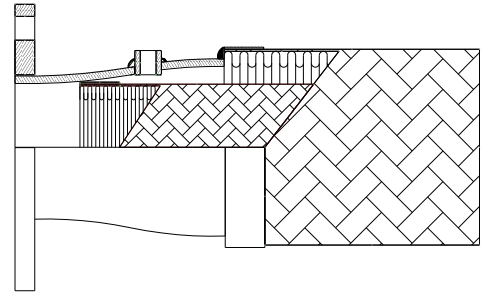
Traced Assemblies are used when the product being conveyed must be heated in order to flow freely. Steam or hot oil circulated through the inner tracer hose heats the product in order to maintain high flow rates.

LINED ASSEMBLY

Product being conveyed through an unlined corrugated metal hose at high velocity can set up resonant vibration within the hose causing it to prematurely fail. This may be eliminated by adding a liner to the hose.

GUARDED ASSEMBLY

Guarded Assemblies are used where rough handling, abrasion, or flexing past its minimum bend radius could easily damage a corrugated metal hose.



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SELECTING METAL HOSE

Consider these selection factors for a particular application

1. Size of Connecting Pipe

The size of metal hose for a given application is usually determined by the size of the existing piping and mating fittings. However, other considerations such as pressure drop, rate of flow, and velocity also influence your selection of the proper size of hose.

2. Temperature of Operation in Relation to Pressure and Material

Temperature affects the physical properties of any material. This factor must be taken into account, as well as the working pressure and the specific applications. Hose type, metal alloy, fittings, and attachments determine the temperature limit.

3. Media in Relation to Corrosion of Hose Material

A primary consideration in specifying metal hose is to select a material, which is resistant to the media to be conveyed through the hose; this is possible in most applications. Remember to consider the corrosive effects of the outside environment, as well as the media conveyed within. *Both factors are significant.* Remember also that metal hose, a thin walled material, will not have the same life as pipe or tube that is a heavier-walled material, even though they are both of the same material.

4. Pressures – Operating, Test and Burst Needed for the Application

The pressure rating for each type of flexible metal hose is affected by the conditions of actual use, such as, shock or pulsating conditions, temperature, and bending stresses. The maximum operating pressure is 25% of the *Nominal Burst Pressure*, while the maximum test pressure is 50% of the *Maximum Operating Pressure*. The Nominal Burst Pressure is the pressure at which the hose can be expected to rupture. When pulsating, surge or shock pressures exist, from conditions such as fast closing valves, the peak pressure should not exceed 50% of the Maximum Operating Pressure. Refer to our catalog that specifies the pressure ratings for each of these conditions, as it relates to both braided and unbraided hose. In addition, you should refer to the temperature chart for the pressure ratings as affected by temperatures in excess of 70° Fahrenheit.

5. Motion Type Affecting Hose and Amount of Motion

Flexible metal hose is specified for several different applications; whenever there is excessive vibration; whenever misaligned pipe or tube is encountered or whenever flexibility is needed for manual handling situations. To select the proper hose for any of these applications requires careful consideration of the inherent flexibility of the material in regards to the design of the assembly, installation and versatility expected of the hose.

6. Length of Hose Needed to Absorb Motion in Relation to Space Available.

The type of motion, the offset motion, vibration, as well as live length required, are all factors to consider in determining the proper hose selection. Refer to our catalog for exact specifications of these conditions.

7. Fittings Needed to Connect to Existing Connections Compatible with Media, Temperature, and Pressure

End linings may have male or female threads. In addition to conventional unions – flanges, flared tube fittings – special designs or custom connectors are available. The appropriate type of hose, alloy and temperature determines the attachment method welding, soldering, silver brazing, or mechanical. Contact Global-Flex Mfg. for custom fitting information.

8. Flow Velocity

High flow velocities in metal hose can cause vibration resulting in noise and premature failure.

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INSTALLATION INFORMATION

Avoid Torque

Do not twist the hose assembly during installation when aligning the bolt holes in a flange or in mating up pipe threads. The utilization of lap joint flanges or pipe unions will minimize this condition. It is recommended that two wrenches be used in making the union connection: one to prevent the hose from twisting and the other to tighten the coupling.

Prevent Out-of Plane-Flexing in an installation

Always install the hose so that the flexing takes place in only one plane – this being the plane in which the bending occurs.

Avoid Over Bending

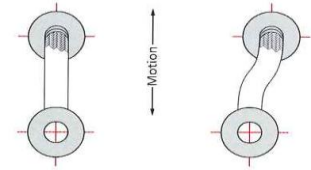
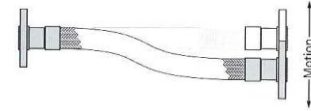
The repetitive bending of a hose to a radius smaller than the radius listed in the specification tables for corrugated hose will result in early hose failure. Always provide sufficient length to prevent over bending and to eliminate strain on the hose.

Avoid Careless Handling of the Hose Assembly

Always lift or carry metal hose to prevent abrasion damage particularly to braided corrugated hose. Store metal hose assemblies away from areas where it can be subjected to spillage, corrosive fumes or sprays, weld splatter, etc.

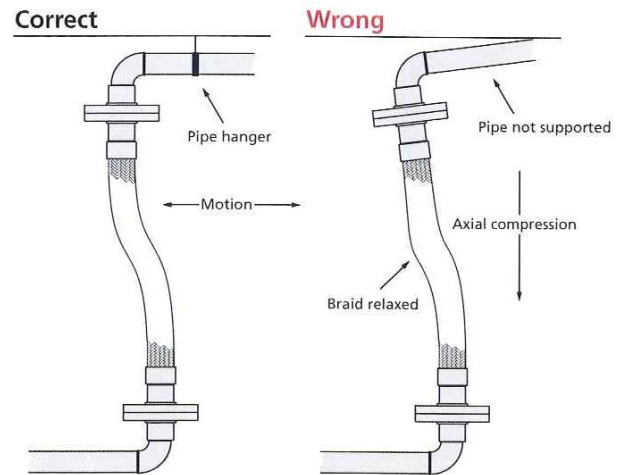
Always Support the Piping

A piping system, which utilizes metal hose to absorb movement, must be properly anchored and/or guided. Always support the piping to prevent excessive weight from compressing the hose and relaxing the braid tension.



Correct
in plane
flexing

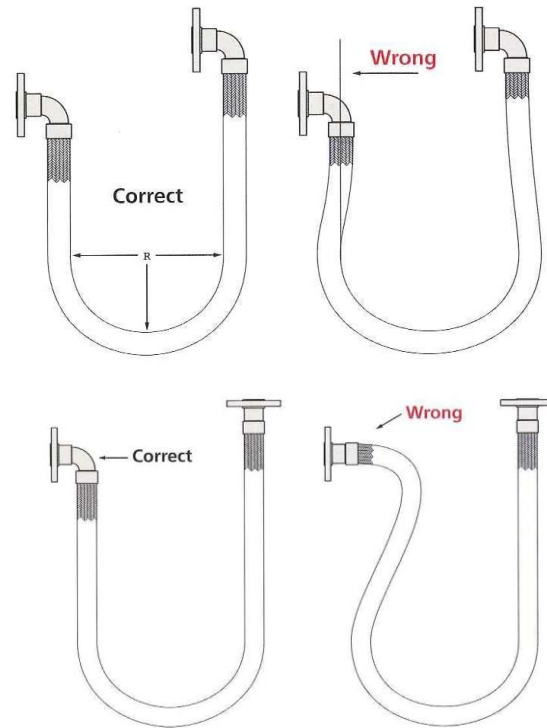
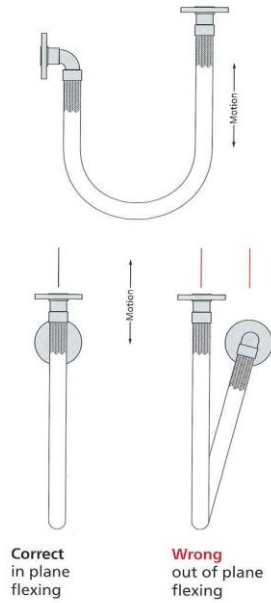
Wrong
out of plane
flexing



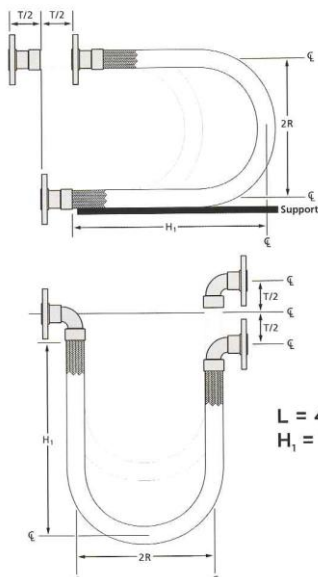
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In plane traveling loop installation

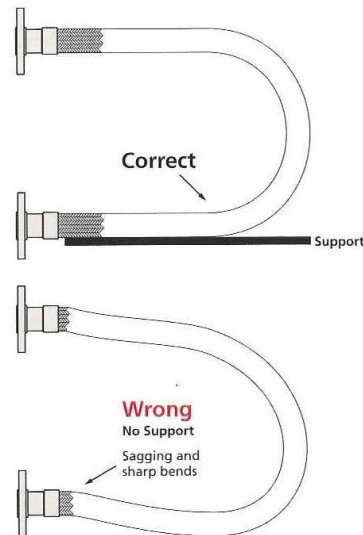


Constant Radius Traveling Loop - Class A



$$L = 4R + T/2$$

$$H_1 = 1.43R + T/2$$



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DO.....

DON'T....

Follow any instructions included with the flexible connector

Follow industry-recommended practices and use care in handling and installing flexible connectors

Install flexible connectors so the bend is as close to the center of the connector possible

Observe the minimum bend radius as specified by the connector manufacture

Trial-fit threaded connections by hand, unmake and then make permanent

Use a flexible connector of proper length to suite the installation

Only wrench on the fitting hex flats as provided

Design the installation to allow for ground movement after installation, such as settling or frost heave

Install the proper length connector to allow a 2" straight rub of hose at each end of fitting

Use pipe wrenches on both mating hexes to avoid twisting the hose

Keep hose free from all objects and debris

Handle and store connectors carefully prior to installation

Check for leaks before covering the installation

Install in such a manner that the connector can be removed

Make sure the pressure rating of connector is not exceeded

Apply a wrench to the hose, or collar of the assembly

Twist hose assemblies during or when aligning the bolt holes in a flange or when making up pipe threads

"Pre-flex" a flexible connector to limber it up. Over-bending could cause damage and result in leakage.

Over-bend a flexible connector. A 45-90 degree bend should be sufficient to install any flexible connector.

Install a flexible connector with the bend next to the end fitting. This could cause damage and result in leakage.

Lay the flexible connector on rocks or other objects which could puncture the hose and cause leakage

Attempt to stretch or compress a flexible connector to fit an installation

Restrict flexibility by allowing connectors to come into contact with other components or equipment during installation

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WORKING PRESSURE DERATING FACTOR FOR ELEVATED TEMPERATURES

TEMPERATURE IN DEGREES F.	WORKING PRESSURE DERATING FACTOR			
	T321/T316L	T304	Carbon Steel	Bronze
70	1.00	1.00	1.00	1.00
150	.97	.96	.99	.92
200	.94	.92	.97	.89
250	.92	.91	.96	.86
300	.88	.86	.93	.83
350	.86	.85	.91	.81
400	.83	.82	.87	.78
450	.81	.80	.86	.75
500	.78	.77	.81	
600	.74	.73	.74	
700	.70	.69	.66	
800	.66	.64	.52	
900	.62	.58	.50	
1000	.60			
1100	.58			
1200	.55			
1300	.50			
1400	.44			
1500	.40			

To calculate a working pressure de-rated for elevated temperature: Multiply the hose working pressure shown in the catalog by the appropriate de-rating factor from above.

Note: The working pressure of an assembly at elevated temperatures may be affected by fittings type, material, and method of attachment.

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OFFSET CHART

To determine the required live length of an application:

Find the specific bend radius from the general data sheet. Now, locate that bend radius on the chart below. From the offset (Y) across the top of the chart, locate the offset in inches. Read down to the bend radius and the number will be the live length required. Remember to always go to the next highest number in all calculations.

Example: UN series 1” diameter with an 1” offset is required.

Find the bend radius from the General Data Sheet for 1” hose – it is 7.68. Under bend radius on this chart go to 8. Follow across to the required offset, which is 1”. The live length in this case would be 7”. Note: If the offset (Y) occurs on both sides of the centerline, the live length is based on **the total travel or 2 times Y.**

BEND RADIUS	Offset Y (Inches)														
	.25	.50	.76	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00	6.00	8.00	10.00	12.00
.50	0.9	1.3	1.7	2.0	2.3	2.6	3.2	3.7	4.2	5.3	6.3	7.3	9.4	11.4	13.4
1	1.3	1.8	2.3	2.6	3.0	3.4	4.0	4.6	5.2	6.3	7.4	8.5	10.6	12.6	14.7
2	1.8	2.5	3.1	3.6	4.1	4.5	5.3	6.0	6.7	8.0	9.2	10.5	12.6	14.8	17.0
3	2.1	3.0	3.8	4.4	4.9	5.4	6.3	7.2	7.9	9.4	10.7	12.0	14.4	16.7	19.0
4	2.5	3.5	4.3	5.0	5.6	6.2	7.2	8.1	9.0	10.6	12.0	13.4	16.0	18.4	20.8
5	2.8	3.9	4.8	5.6	6.3	6.9	8.0	9.0	9.9	11.7	13.21	14.7	17.4	20.0	22.4
6	3.0	4.3	5.3	6.1	6.8	7.5	8.7	9.8	10.8	12.6	14.3	15.9	18.8	21.4	24.0
7	3.3	4.6	5.7	6.6	7.4	8.1	9.4	10.5	11.6	13.6	15.3	17.0	20.0	22.8	25.5
8	3.5	4.9	6.0	7.0	7.8	8.6	10.0	11.2	12.4	14.4	16.3	18.0	21.2	24.1	26.6
9	3.7	5.2	6.4	7.4	8.3	9.1	10.6	11.9	13.1	15.2	17.2	19.0	22.3	25.3	28.1
10	3.9	5.5	6.8	7.8	8.8	9.6	11.1	12.5	13.7	16.0	18.0	19.9	23.3	26.5	29.4
12	4.3	6.0	7.4	8.5	9.6	10.5	12.2	13.6	15.0	17.4	19.6	21.6	25.3	28.6	31.7
14	4.6	6.5	8.0	9.2	10.3	11.3	13.1	14.7	16.2	18.8	21.1	23.2	27.1	30.7	33.9
16	4.9	6.7	8.5	9.8	11.0	12.1	14.0	15.7	17.2	20.0	22.5	24.7	28.8	32.6	36.0
18	5.2	7.4	9.0	10.4	11.7	12.8	14.8	16.6	18.3	21.2	23.8	26.2	30.5	34.4	37.9

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METAL HOSE NOTE PAD

S IZE

T EMPERATURE

A PPLICATION

M EDIUM

P RESSURE

E NDS

D ELIVERY