US HOSE
TITEFLEX

10th Edition

ENGINEERING GUIDE NO. 350

Flexible Metallic Hose, Braid and Assemblies

U.S. Hose® Corp

Romeoville, Illinois

Houston, Texas

Springfield, Massachusetts

One source for all your flexible hose needs: Metal, Composite and Fluoropolymer hose and assemblies

For over 100 years, the US Hose® Corp has remained the preeminent manufacturer of metal, fluoropolymer and composite hose products. As part of US Hose/Titeflex, our factories in Romeoville, Illinois, Houston, Texas and Springfield, Massachusetts complement an impressive global network of specialty hose manufacturing facilities throughout North America and Europe..

Our diverse product line coupled with unparalleled engineering and customer service support enables us to provide our customers with a flexible hose solution for nearly any liquid and gaseous transfer application.

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Quick Reference Hose Pressure Chart

Maximum Working Pressure in PSI at 70° F

	Diameter																
Product Type	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	3-1/2"	4"	5"	6"	8"	10"	12"
T321 pg. 4	-	1100	796	597	455	441	370	370	-	-	-	-	-	-	-	-	-
Series 461/861 pg. 5	2240	1450	1040	600	580	450	410	-	-	-	-	-	-	-	-	-	-
Series 462/862 pg. 5	-	2430	1665	1080	1035	820	650	-	-	-	-	-	-	-	-	-	-
UFBX-1 T321 pg. 6	2420	1450	1075	950	725	563	500	478	377	320	-	-	-	-	-	-	-
UFBX-2 T321 pg. 6	3190	2580	1500	1250	1110	825	800	638	667	580	-	-	-	-	-	-	-
UFBX-1 T316 pg. 7	2420	1450	1375	1040	940	667	580	478	-	-	-	-	-	-	-	-	-
UFBX-2 T316 pg. 7	3190	2580	2230	1900	1480	1230	1045	870	-	-	-	-	-	-	-	-	-
AFBX-1 pg. 8	1825	1350	1200	875	900	515	435	425	-	-	-	-	-	-	-	-	-
AFBX-2 pg. 8	-	-	-	-	-	800	800	600	-	-	-	-	-	-	-	-	-
480 pg. 9	-	-	-	-	-	-	-	450	390	250	-	210	167	-	-	-	-
481 pg. 9	-	-	-	-	-	-	-	380	450	450	305	315	310	200	295	210	200
482 pg. 9	-	-	-	-	-	-	-	580	670	770	340	460	310	200	345	380	365
881 pg. 10	-	-	-	-	-	-	-	400	500	375	340	260	340	210	220	185	180
882 pg. 10	-	-	-	-	-	-	-	580	670	550	620	465	435	310	340	330	315
401M pg. 11	2660	1610	1310	915	645	545	560	450	570	450	265	285	265	240	217	210	200
402M pg. 11	4500	2435	2355	1650	1165	980	1000	810	750	560	265	375	265	285	270	375	360
401H pg. 12	2660	1610	1310	915	645	545	560	450	570	450	340	285	350	240	275	250	180
402H pg. 12	4500	2900	2355	1650	1165	980	1000	810	1030	820	600	515	385	430	350	375	320
402X pg. 13	5300	3900	3600	3550	2800	2480	2200	1675	-	-	-	-	-	-	-	-	-
403XM pg. 13	-	-	-	-	-	-	-	-	-	1200	-	-	-	-	-	-	-
403XM-I pg. 13	-	-	-	-	-	-	-	-	-	1800	-	-	-	-	-	-	-
404XM pg. 13	-	-	-	-	-	-	-	-	-	-	-	1200	-	-	-	-	-
RF67-XFC pg. 14	12000	9000	8500	6800	6250	5500	5200	4350	-	3000	-	-	-	-	-	-	-
Bronze CP pg. 15	1310	975	735	595	460	430	390	280	-	-	-	-	-	-	-	-	-
USCX pg. 16	1825	1350	1200	875	900	515	435	425	-	-	-	-	-	-	-	-	-
280X/286X pg. 16	2240	1374	1028	598	567	447	392	-	-	-	-	-	-	-	-	-	-
501 Monel 400 pg. 17	2250	1575	835	600	420	315	565	415	-	225	-	-	-	-	-	-	-
502 Monel 400 pg. 17	3025	2050	1500	1080	755	570	1015	745	-	425	-	-	-	-	-	-	-
INCO1 Inconel 625 pg. 18	2660	1610	1310	915	645	545	560	460	-	440	-	270	-	-	-	-	-
HAS01 Hastelloy pg. 18	-	-	1550	915	645	575	585	470	-	-	-	-	-	-	-	-	-

US HOSE TITEFLEX

Braded Table

T-321 Stainless Steel Slip-On Braid Specification

TYPICAL HOSE O.D. (IN.)	NOMINAL HOSE O.D. (IN.)	BRAID I.D. (IN.)	BRAID CONSTRUCTION	BRAID ANGLE	COVERAGE (%)	WORKING PRESSURE (LB/FT)	WEIGHT (LB/FT)
0.49	1/4	0.48	24x5x.0126	52	84.0	2600	0.07
0.49	1/4	.055	24x6x.016	52	96.1	4250	0.13
0.66	3/8	0.66	24x6x.0126	52	78.7	1610	0.08
0.66	3/8	0.79	24x7x.016	52	88.7	2340	0.15
0.84	1/2	0.84	24x8x.0126	52	80.8	1310	0.11
0.84	1/2	0.84	24x6x.024	52	95.3	3350	0.29
1.21	3/4	1.20	48x6x.0126	52	83.7	915	0.16
1.21	3/4	1.24	48x4x.024	52	92.4	2000	0.38
1.53	1	1.50	48x5x.024	52	93.8	1600	0.48
1.53	1	1.53	48x7x.0126	52	79.7	645	0.19
1.86	1 1/4	1.86	48x9x.0126	52	82.6	545	0.24
1.86	1 1/4	1.86	48x6x.024	52	92.8	1200	0.58
2.19	1 1/2	2.19	48x8x.016	52	80.5	560	0.34
2.19	1 1/2	2.61	48x8x.024	52	91.0	950	0.77
2.83	2	2.83	48x12x.016	52	92.5	450	0.57
2.83	2	3.11	48x10x.024	52	93.1	760	0.96
3.00	2 1/2	3.00	64x9x.020	52	94.5	570	0.73
3.57	3	3.57	64x10x.020	52	91.3	450	0.89
4.72	4	4.72	64x13x.020	45	95.5	285	1.29
7.00	6	7.00	64x15x.024	46	92.0	240	2.08
9.00	8	9.00	(96x17x.025)	55	89.0	261	3.39
11.25	10	11.25	(96x29x.020)	57	84.0	186	3.64
13.25	12	13.25	(96x29x.025)	47	97.0	179	6.54
14.50	14	14.50	(96x29x.025)	50	95.0	149	6.16
16.50	16	16.50	(96x29x.025)	48	92.0	111	6.37

460 and 860 Series

Construction:

460/T321 stainless steel hose
860/T316L stainless steel hose
Series 300 stainless steel braid
Helical construction
Also available 1/4″–1 1/2″ direct braided

Sizes:

1/4″ through 1 1/2″

Maximum Working Pressure:

Full vacuum up to 2240 psig depending on size and braid construction

Temperature:

Cryogenic to 1250˚F.

461 One Braid
462 Two Braid

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
1/4″	460	0.42	0.06	3.50	0.625	3.500	75	110	—
	461	0.48	0.13	3.50	0.625	3.500	2240	3360	8960
3/8″	460	0.57	0.09	4.00	0.875	4.000	50	75	—
	461	0.63	0.17	4.00	0.875	4.000	1450	2175	5800
	462	0.69	0.25	4.00	0.875	4.000	2430	3645	9720
1/2″	460	0.75	0.12	4.50	1.125	5.500	50	75	—
	461	0.81	0.21	4.50	1.125	5.500	1040	1560	4160
	462	0.87	0.30	4.50	1.125	5.500	1665	2498	6660
3/4″	460	1.04	0.18	5.50	1.500	6.000	30	45	—
	461	1.10	0.30	5.50	1.500	6.000	600	900	2400
	462	1.16	0.33	5.50	1.500	6.000	1080	1620	4320
1	460	1.36	0.28	6.25	2.000	7.000	25	37	—
	461	1.42	0.45	6.25	2.000	7.000	580	870	2320
	462	1.48	0.62	6.25	2.000	7.000	1035	1550	4140
1 1/4″	460	1.68	0.46	7.00	2.500	11.500	20	30	—
	461	1.74	0.66	7.00	2.500	11.500	450	675	1800
	462	1.80	0.86	7.00	2.500	11.500	820	1230	3275
1 1/2″	460	2.02	0.59	7.75	3.000	14.000	15	23	—
	461	2.09	0.83	7.75	3.000	14.000	410	615	1640
	462	2.16	1.07	7.75	3.000	14.000	650	975	260

Annular Hose Construction

One Braid Shown

UFBX (T321 SS)

Construction:

T321 stainless steel hose
Series 300 stainless steel braid
Direct braided 1/4″ through 2″ on **reels**
Annular construction

Sizes:

1/4″ through 3″

Maximum Working Pressure:

Full vacuum up to 3190 psig depending on size and braid configuration

Temperature:

Cryogenic to 1250˚F

UFBX0 Unbraided
UFBX1 One Braid
UFBX2 Two Braid

The UFBX product is designed and certified to ISO 10380 specifications.

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
1/4″	UFBX0	0.40	0.05	3.00	0.630	4.300	145	218	—
	UFBX1	0.45	0.11	3.00	1.000	4.300	2420	3630	9680
	UFBX2	0.50	0.16	3.00	1.000	4.300	3190	4785	12760
3/8″	UFBX0	0.59	0.11	3.50	0.870	6.000	80	120	—
	UFBX1	0.64	0.18	3.50	1.500	6.000	1450	2175	5800
	UFBX2	0.69	0.25	3.50	1.500	6.000	2580	3870	10320
1/2″	UFBX0	0.77	0.11	4.25	0.940	6.500	80	120	—
	UFBX1	0.83	0.22	4.25	1.750	6.500	1075	1615	4300
	UFBX2	0.88	0.33	4.25	1.750	6.500	1500	2250	6000
3/4″	UFBX0	1.02	0.18	4.50	1.200	8.000	60	90	—
	UFBX1	1.08	0.35	4.50	2.750	8.000	950	1425	3800
	UFBX2	1.14	0.52	4.50	2.750	8.000	1250	1875	5000
1″	UFBX0	1.33	0.21	5.50	1.700	8.000	60	90	—
	UFBX1	1.41	0.47	5.50	3.500	8.000	725	1087	2900
	UFBX2	1.49	0.73	5.50	3.500	8.000	1110	1650	4470
1 1/4″	UFBX0	1.62	0.27	6.00	2.200	10.000	50	75	—
	UFBX1	1.70	0.57	6.00	4.500	10.000	563	845	2252
	UFBX2	1.78	0.87	6.00	4.500	10.000	825	1237	3300
1 1/2″	UFBX0	1.88	0.45	6.25	2.700	10.000	35	53	—
	UFBX1	1.95	0.94	6.25	5.000	10.000	500	750	2000
	UFBX2	2.05	1.43	6.25	5.000	10.000	800	1200	3200
2″	UFBX0	2.45	0.55	7.50	3.500	14.000	15	23	—
	UFBX1	2.53	1.00	7.50	7.630	14.000	478	717	1912
	UFBX2	2.61	1.50	7.50	7.630	14.000	638	957	2552
2 1/2″	UFBX0	3.01	1.30	7.50	4.500	16.000	15	23	—
	UFBX1	3.09	1.90	7.50	7.900	16.000	377	566	1508
	UFBX2	3.18	2.50	7.50	7.900	16.000	667	1001	2668
3″	UFBX0	3.54	1.50	8.75	5.100	18.000	15	23	—
	UFBX1	3.62	2.20	8.75	9.000	18.000	320	480	1280
	UFBX2	3.70	3.00	8.75	9.000	18.000	580	870	2320

UFBX (T316L)

Construction:

T316L stainless steel hose
Series 300 stainless steel braid
Direct braided 1/4" through 2" on **reels**
Annular construction

Sizes:

1/4" through 2"

Maximum Working Pressure:

Full vacuum up to 3190 psig depending on size and braid configuration

Temperature:

Cryogenic to 1250˚F

The UFBX product is designed and certified to ISO 10380 specifications.

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
1/4"	UFBXO	0.40	0.06	3.00	0.630	4.000	145	218	—
	UFBX1	0.45	0.11	3.00	1.000	4.000	2420	3630	9680
	UFBX2	0.50	0.16	3.00	1.000	4.000	3190	4785	12760
3/8"	UFBXO	0.59	0.11	4.25	0.870	6.000	80	120	—
	UFBX1	0.64	0.183	4.25	1.500	6.000	1450	2175	5800
	UFBX2	0.69	0.256	4.25	1.500	6.000	2580	3870	10320
1/2"	UFBXO	0.75	0.13	4.25	0.950	6.500	80	120	—
	UFBX1	0.81	0.24	4.25	1.750	6.500	1375	2063	5500
	UFBX2	0.87	0.35	4.25	1.750	6.500	2230	3345	8920
3/4"	UFBXO	1.00	0.24	4.50	1.200	7.900	60	90	—
	UFBX1	1.07	0.91	4.50	2.750	8.000	1040	1560	4160
	UFBX2	1.14	0.58	4.50	2.750	8.000	1900	2850	7600
1"	UFBXO	1.29	0.35	5.50	1.700	8.000	60	90	—
	UFBX1	1.39	0.61	5.50	3.500	8.000	940	1410	3760
	UFBX2	1.49	0.87	5.50	3.500	8.000	1480	2220	5920
1 1/4"	UFBXO	1.60	0.43	6.00	2.200	10.000	50	75	—
	UFBX1	1.69	0.73	6.00	4.250	10.000	667	1000	2668
	UFBX2	1.78	1.03	6.00	4.250	10.000	1230	1845	4920
1 1/2"	UFBXO	1.87	0.60	6.25	2.750	10.000	35	53	—
	UFBX1	1.96	1.09	6.25	5.000	10.000	580	870	2320
	UFBX2	2.05	1.58	6.25	5.000	10.000	1045	1568	4180
2"	UFBXO	2.43	0.77	7.50	3.500	14.000	15	23	—
	UFBX1	2.53	1.25	7.50	7.000	14.000	478	717	1912
	UFBX2	2.63	1.75	7.50	7.000	14.000	870	1305	3480
2-1/2""	UFBXO	3.01	1.30	7.50	4.500	16.000	15	23	—
	UFBX1	3.09	1.90	7.50	7.900	16.000	377	566	1508
	UFBX2	3.18	2.50	7.50	7.900	16.000	667	1001	2668
3"	UFBXO	3.54	1.50	8.75	5.100	18.000	15	23	—
	UFBX1	3.62	2.20	8.75	9.000	18.000	320	480	1280
	UFBX2	3.70	3.00	8.75	9.000	18.000	580	870	2320

AFBX

Construction:

T321 and ***T316L*** stainless steel hose
Series 300 stainless steel braid
Annular construction
Direct braided on reels - up to 500 feet

Sizes:

1/4″ through 2″

Maximum Working Pressure:

Full vacuum up to 1825 psig depending on size

Temperature:

Cryogenic to 1250˚F

USBX Unbraided USBX-1 One Braid
USBX-2 Two Braid

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
1/4″	USBX0	0.38	0.05	3.50	0.591	3.150	145	218	—
	USBX1	0.43	0.06	3.50	0.984	3.150	1825	2738	7300
3/8″	USBX0	0.56	0.07	4.50	0.709	5.039	80	120	—
	USBX1	0.61	0.16	4.50	1.496	5.039	1350	2025	5400
1/2″	USBX0	0.79	0.12	4.75	1.102	6.300	80	120	—
	USBX1	0.84	0.26	4.75	2.284	6.300	1200	1800	4800
3/4″	USBX0	1.06	0.17	5.25	1.260	6.614	60	90	—
	USBX1	1.11	0.33	5.25	2.756	6.614	875	1313	3500
1″	USBX0	1.27	0.23	5.50	1.575	7.480	60	90	—
	USBX1	1.34	0.52	5.50	3.346	7.480	900	1350	3600
1 1/4″	USBX0	1.62	0.29	7.50	1.969	10.039	50	75	—
	USBX1	1.67	0.53	7.50	4.134	10.039	515	773	2060
	USBX2	1.72	0.77	7.50	4.134	10.039	800	1200	3200
1 1/2″	USBX0	1.96	0.47	8.00	2.362	11.614	36	54	—
	USBX1	2.03	0.85	8.00	5.118	11.614	435	653	1740
	USBX2	2.10	1.23	8.00	5.118	11.614	800	1200	3200
2″	USBX0	2.38	0.60	9.50	2.756	12.598	15	23	—
	USBX1	2.44	1.06	9.50	6.299	12.598	425	638	1700
	USBX2	2.50	1.52	9.50	6.299	12.598	600	900	2400

480 Large Diameter Hose

Construction:
T321 stainless steel hose
Series 300 stainless steel braid
Annular construction

Sizes:
2″ through 12″

Maximum Working Pressure:
Full vacuum up to 670 psig depending on size and braid configuration

Temperature:
Cryogenic to 1500˚F

480 Unbraided
481 One Braid
482 Two Braid

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
2 1/2″	480	3.11	1.00	11.00	7.000	16.000	6	9	—
	481	3.21	1.77	11.00	7.000	16.000	450	675	1800
	482	3.30	2.54	11.00	7.000	16.000	670	1005	2680
3″	480	3.57	1.35	11.00	8.250	19.000	4	6	—
	481	3.69	1.83	11.00	8.250	19.000	445	670	1780
	482	3.76	2.57	11.00	8.250	19.000	560	850	2240
3 1/2″	480	4.14	1.69	11.50	9.750	20.500	3	4	—
	481	4.26	1.91	11.50	9.750	20.500	265	400	1060
4″	480	4.72	1.66	12.00	11.000	22.000	2	3	—
	481	4.82	2.59	12.00	11.000	22.000	285	425	1140
	482	4.91	3.52	12.00	11.000	22.000	375	565	1500
5″	480	5.86	2.27	13.00	13.500	28.000	2.8	4	—
	481	5.96	3.57	13.00	13.500	28.000	265	500	1060
6″	480	7.00	3.53	14.00	16.000	34.000	3	4.5	—
	481	7.10	5.22	14.00	16.000	34.000	195	290	780
	482	7.19	6.91	14.00	16.000	34.000	195	290	780
8″	480	9.06	4.59	16.00	20.000	42.000	2	3	—
	481	9.16	7.91	16.00	20.000	42.000	220	325	870
	482	9.26	11.23	16.00	20.000	42.000	270	405	1080
10″	480	11.19	5.93	24.00	34.000	69.000	2	3	—
	481	11.29	10.30	24.00	34.000	69.000	210	315	840
	482	11.39	14.67	24.00	34.000	69.000	375	565	1500
12″	480	13.25	7.08	27.00	37.000	74.000	1.8	2.8	—
	481	13.35	13.62	27.00	37.000	74.000	200	300	800
	482	13.45	20.16	27.00	37.000	74.000	360	540	1440

880 Large Diameter Hose

Construction:

T316L stainless steel hose
Series 300 stainless steel braid
Annular construction

Sizes:

2″ through 12″

Maximum Working Pressure:

Full vacuum up to 670 psig depending on size and braid configuration

Temperature:

Cryogenic to 1500˚F

880 Unbraided
881One Braid
882 Two Braid

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
2 1/2″	880	3.11	1.24	11.00	7.000	16.000	6	9	—
	881	3.21	3.01	11.00	7.000	16.000	500	750	2000
	882	3.30	2.78	11.00	7.000	16.000	670	1005	2680
3″	880	3.57	1.35	11.00	8.250	19.000	4	6	—
	881	3.69	2.78	11.00	8.250	19.000	375	560	1500
	882	3.76	4.21	11.00	8.250	19.000	550	825	2200
3 1/2″	880	4.14	1.69	11.50	9.750	20.500	3	4	—
	881	4.26	2.54	11.50	9.750	20.500	340	510	1360
	882	4.48	3.40	11.50	9.750	20.500	620	930	2480
4″	880	4.72	2.06	12.00	11.000	22.000	2	3	—
	881	4.82	3.00	12.00	11.000	22.000	260	390	1050
	882	4.91	3.94	12.00	11.000	22.000	465	695	1860
5″	880	5.86	2.68	13.00	13.500	28.000	3	4	—
	881	5.96	3.98	13.00	13.500	28.000	340	510	1360
	882	6.06	5.28	13.00	13.500	28.000	435	650	1740
6″	880	7.00	4.44	14.00	16.000	34.000	3	4.5	—
	881	7.10	6.14	14.00	16.000	34.000	210	315	850
	882	7.19	7.87	14.00	16.000	34.000	310	465	1240
8″	880	9.06	5.70	16.00	20.000	42.000	2	3	—
	881	9.16	9.02	16.00	20.000	42.000	220	330	875
	882	9.26	12.34	16.00	20.000	42.000	340	510	1360
10″	880	11.19	5.93	24.00	34.000	69.000	2	3	—
	881	11.29	10.30	24.00	34.000	69.000	185	275	740
	882	11.39	14.67	24.00	34.000	69.000	330	495	1320
12″	880	13.25	7.08	27.00	37.000	74.000	2	3	—
	881	13.35	13.62	27.00	37.000	74.000	175	260	700
	882	13.45	20.16	27.00	37.000	74.000	315	470	1260

400M Hose

Construction:

T321 stainless steel hose
Series T321 stainless steel braid
Annular construction

Sizes:

1/4" through 12"

Maximum Working Pressure:

Full vacuum up to 4500 psig depending on size and braid configuration

Temperature:

Cryogenic to 1500˚F

400M Unbraided
401M One Braid
402M Two Braid

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
1/4"	400M	0.49	0.14	3.75	0.875	5.500	200	300	—
	401M	0.55	0.21	3.75	0.875	5.500	2660	4000	10650
	402M	0.61	0.28	3.75	0.875	5.500	4500	6750	18000
3/8"	400M	0.66	0.18	4.25	1.125	5.500	100	150	—
	401M	0.73	0.25	4.25	1.125	5.500	1610	2415	6440
	402M	0.79	0.35	4.25	1.125	5.500	2435	3650	9750
1/2"	400M	0.84	0.27	4.50	1.500	6.000	80	120	—
	401M	0.90	0.38	4.50	1.500	6.000	1310	1965	5240
	402M	0.96	0.49	4.50	1.500	6.000	2355	3530	9420
3/4"	400M	1.21	0.51	5.50	2.125	8.000	70	105	—
	401M	1.27	0.67	5.50	2.125	8.000	915	1370	3660
	402M	1.33	0.84	5.50	2.125	8.000	1650	2475	6600
1"	400M	1.53	0.75	6.50	2.750	9.000	43	65	—
	401M	1.59	0.93	6.50	2.750	9.000	645	965	2580
	402M	1.65	1.13	6.50	2.750	9.000	1165	1745	4660
1 1/4"	400M	1.86	0.96	7.00	3.250	10.500	29	43	—
	401M	1.92	1.20	7.00	3.250	10.500	545	820	2180
	402M	1.98	1.45	7.00	3.250	10.500	980	1470	3920
1 1/2"	400M	2.19	1.47	7.50	3.750	12.000	31	47	—
	401M	2.27	1.85	7.50	3.750	12.000	560	840	2240
	402M	2.35	2.20	7.50	3.750	12.000	1000	1500	4000
2"	400M	2.83	1.97	9.00	5.000	15.000	17	26	—
	401M	2.91	2.44	9.00	5.000	15.000	450	675	1800
	402M	2.99	2.90	9.00	5.000	15.000	810	1215	3240
2 1/2"	400M	3.00	1.42	7.00	7.000	14.000	6.5	10	—
	401M	3.12	2.19	7.00	7.000	14.000	570	855	2280
	402M	3.24	2.96	7.00	7.000	14.000	750	1125	3000
3"	400M	3.57	1.82	8.00	8.250	17.000	4.5	6.8	—
	401M	3.69	2.70	8.00	8.250	17.000	450	675	1800
	402M	3.81	3.58	8.00	8.250	17.000	560	840	2240
3 1/2"	400M	4.14	1.57	9.00	9.500	19.000	3	5	—
	401M	4.26	2.43	9.00	9.500	19.000	265	398	1060
	402M	4.38	3.29	9.00	9.500	19.000	265	398	1060
4"	400M	4.72	2.38	10.00	11.000	22.000	2	3	—
	401M	4.84	3.34	10.00	11.000	22.000	285	425	1140
	402M	4.96	4.30	10.00	11.000	22.000	375	563	1500
5"	400M	5.93	3.20	17.50	11.000	28.000	2.8	4.3	—
	401M	6.03	4.50	17.50	11.000	28.000	265	400	1060
	402M	6.13	5.80	17.50	11.000	28.000	265	400	1060
6"	400M	7.00	4.46	17.00	16.500	33.000	3.5	5.3	—
	401M	7.19	6.20	17.00	16.500	33.000	240	360	960
	402M	7.38	7.94	17.00	16.500	33.000	285	428	1140
8"	400M	9.06	5.85	19.00	21.500	43.000	2.7	4.1	—
	401M	9.31	9.39	19.00	21.500	43.000	217	326	868
	402M	9.56	12.93	19.00	21.500	43.000	270	405	1080
10"	400M	11.19	9.17	21.00	27.000	54.000	2.2	3.3	—
	401M	11.44	13.54	21.00	27.000	54.000	210	315	840
	402M	11.69	17.91	21.00	27.000	54.000	375	563	1500
12"	400M	13.25	10.93	23.00	32.000	64.000	1.8	2.8	—
	401M	13.50	16.94	23.00	32.000	64.000	200	300	800
	402M	13.75	22.95	23.00	32.000	64.000	360	540	1440

400H Hose

Construction:

T316L stainless steel hose
Series T321 stainless steel braid
Annular construction

Sizes:

1/4" through 12"

Maximum Working Pressure:

Full vacuum up to 4500 psig depending on size and braid configuration

Temperature:

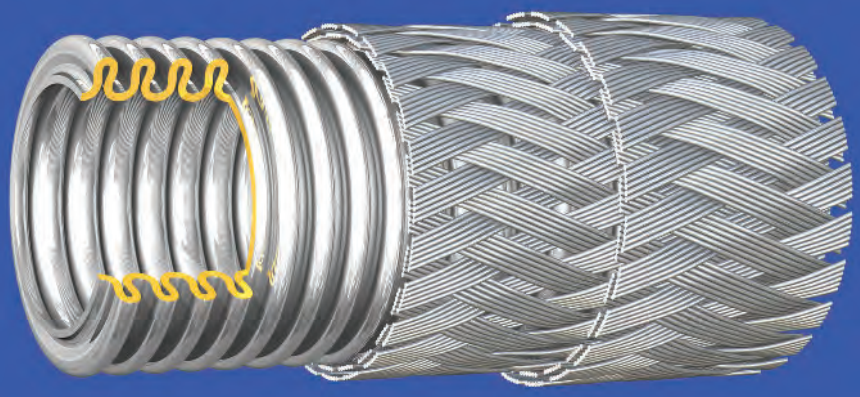
Cryogenic to 1500˚F

400H Unbraided
401H One Braid
402H Two Braid

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
1/4"	400H	0.49	0.14	3.75	0.875	5.500	265	400	—
	401H	0.55	0.21	3.75	0.875	5.500	2660	4000	10650
	402H	0.61	0.28	3.75	0.875	5.500	4500	6750	18000
3/8"	400H	0.66	0.21	4.50	1.125	6.000	133	200	—
	401H	0.73	0.29	4.50	1.125	6.000	1610	2415	6440
	402H	0.79	0.38	4.50	1.125	6.000	2900	4325	11600
1/2"	400H	0.84	0.36	5.00	1.500	7.000	133	200	—
	401H	0.90	0.47	5.00	1.500	7.000	1310	1965	5240
	402H	0.96	0.58	5.00	1.500	7.000	2355	3530	9420
3/4"	400H	1.21	0.71	5.75	2.125	8.500	100	150	—
	401H	1.27	0.87	5.75	2.125	8.500	915	1370	3660
	402H	1.33	1.04	5.75	2.125	8.500	1650	2475	6600
1"	400H	1.53	0.92	7.00	2.750	10.000	63	95	—
	401H	1.59	1.11	7.00	2.750	10.000	645	965	2580
	402H	1.65	1.30	7.00	2.750	10.000	1165	1745	4660
1 1/4"	400H	1.86	1.45	7.50	3.250	11.500	60	90	—
	401H	1.92	1.69	7.50	3.250	11.500	545	820	2180
	402H	1.98	1.94	7.50	3.250	11.500	980	1470	3920
1 1/2"	400H	2.19	1.78	8.00	3.750	13.000	43	65	—
	401H	2.27	2.10	8.00	3.750	13.000	560	840	2240
	402H	2.35	2.50	8.00	3.750	13.000	1000	1500	4000
2"	400H	2.83	2.38	9.50	5.000	16.000	23	34	—
	401H	2.91	2.84	9.50	5.000	16.000	450	675	1800
	402H	2.99	3.38	9.50	5.000	16.000	810	1215	3240
2 1/2"	400H	3.00	2.06	7.75	7.000	17.000	14	20	—
	401H	3.12	2.83	7.75	7.000	17.000	570	855	2280
	402H	3.24	3.74	7.75	7.000	17.000	1030	1545	4120
3"	400H	3.57	2.44	9.00	8.250	21.000	9	14	—
	401H	3.69	3.32	9.00	8.250	21.000	450	675	1800
	402H	3.81	4.30	9.00	8.250	21.000	820	1230	3280
3 1/2"	400H	4.14	2.95	10.00	9.500	25.000	7	10	—
	401H	4.26	3.81	10.00	9.500	25.000	340	510	1360
	402H	4.38	4.67	10.00	9.500	25.000	600	900	2400
4"	400H	4.72	3.20	10.75	11.000	27.000	4	6	—
	401H	4.84	4.16	10.75	11.000	27.000	285	425	1140
	402H	4.96	5.24	10.75	11.000	27.000	515	770	2060
5"	400H	5.93	3.20	17.50	11.000	28.000	4	6	—
	401H	6.03	4.50	17.50	11.000	28.000	350	525	1400
	402H	6.13	5.80	17.50	11.000	28.000	385	578	1540
6"	400H	7.00	5.58	19.00	16.500	41.000	6.5	9	—
	401H	7.19	7.32	19.00	16.500	41.000	240	360	960
	402H	7.38	9.06	19.00	16.500	41.000	430	645	1720
8"	400H	9.06	7.37	21.00	21.500	54.000	5	7.5	—
	401H	9.31	10.91	21.00	21.500	54.000	275	410	1100
	402H	9.56	14.45	21.00	21.500	54.000	350	525	1400
10"	400H	11.19	8.29	27.00	34.000	68.000	2.2	3.3	—
	401H	11.44	12.66	27.00	34.000	68.000	250	375	1000
	402H	11.69	17.03	27.00	34.000	68.000	375	563	1500
12"	400H	13.25	9.94	31.00	42.000	83.000	1.8	2.8	—
	401H	13.45	16.48	31.00	42.000	83.000	180	270	720
	402H	13.65	23.02	31.00	42.000	83.000	320	480	1280

Annular Hose Construction

Two Braid Shown



402X

Construction:
- ***T316L*** stainless steel heavy weight hose
- ***T321*** direct double braid
- Annular construction
- For ultra high pressure and hydraulic applications

Sizes:
- 1/4" through 2"

Maximum Working Pressure:
- Full vacuum up to 5300 psig depending on size

Temperature:
- Cryogenic to 1500˚F

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
1/4"	402X	0.63	0.39	4.25	2.00	8.250	5300	7950	21200
3/8"	402X	0.81	0.53	5.00	2.50	9.000	3900	5850	15600
1/2"	402X	1.05	0.75	6.00	3.00	10.500	3600	5400	14400
3/4"	402X	1.43	1.63	7.00	4.00	12.750	3550	5325	14200
1"	402X	1.75	2.07	8.25	5.25	15.000	2800	4200	11200
1 1/4"	402X	2.08	2.93	9.00	6.50	17.250	2480	3720	9920
1 1/2"	402X	2.41	3.62	10.00	8.00	19.500	2200	3300	8800
2"	402X	3.05	4.63	12.00	11.50	24.000	1675	2512	6700

403XM – T321 Ultra Heavy Hose with Special Tri Stainless Steel Braids

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
3"	403XM	3.94	5.47	15.00	25.00	TBA	1200	1800	4800

403XM-I – NEW PRODUCT

Inconel® 625 Ultra Heavy Hose with Special Tri Stainless Steel Braids

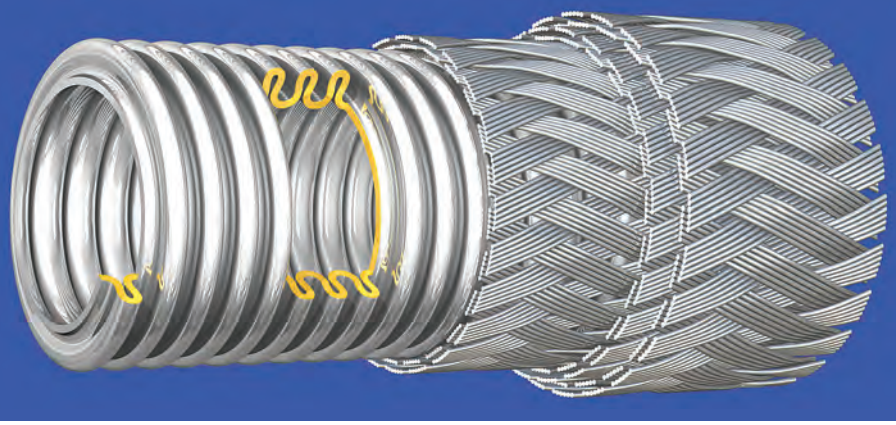
NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
3"	403XM-I	3.99	6.88	15.75	25.00	TBA	1800	2700	7200

404XM – T321 Ultra Heavy Hose with Special Quad Stainless Steel Braids

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
4"	404XM	5.20	9.19	17.00	33.00	114.000	1200	1800	4800

Helical Hose Construction

Multi Braid Layers



RF67-XFC

Construction:
Ultra Heavy ***T321*** hose with multi stainless steel braid layers
Helical construction
For ultra high pressure applications

Sizes:
1/4" through 3"

Maximum Working Pressure:
Full vacuum up to 12000 psig depending on size

Temperature:
Cryogenic to 1500˚F

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE
1/4"	RF67-XFC	0.68	0.62	6.00	2.500	11.500	12000	18000
3/8"	RF67-XFC	0.90	0.97	7.00	3.750	15.000	9000	13500
1/2"	RF67-XFC	1.04	1.34	8.00	4.500	16.500	8500	12750
3/4"	RF67-XFC	1.52	2.56	9.00	6.500	30.500	6800	10200
1"	RF67-XFC	1.93	3.69	10.00	9.000	35.000	6250	9375
1 1/4"	RF67-XFC	2.15	5.08	12.00	10.000	38.000	5500	8250
1 1/2"	RF67-XFC	2.54	6.63	14.00	12.000	41.000	5200	7800
2"	RF67-XFC	3.04	8.07	18.00	15.000	48.000	4350	6525
3"	RF67-XFC	4.06	14.81	24.00	25.000	65,000	3000	4500

Consult US Hose Corp Engineering team for pressure rating support
Pressure rating achieved in controlled environment with custom fittings
Actual pressure rating is Dependant on fittings and other aspects of the application.

AFCX

Construction:
T321 and ***T316L*** stainless steel hose
Series 300 stainless steel braid
Annular construction

Sizes:
Direct braided on reels - up to 500 feet

Maximum Working Pressure:
Full vacuum to 1825 psig depending on use

Temperature:
Cryogenic to 1250˚ F

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
1/4″	USCX0	0.38	0.08	3.50	0.591	3.150	145	218	—
	USCX1	0.43	0.09	3.50	0.984	3.150	1825	2738	7300
3/8″	USCX0	0.56	0.11	4.50	0.709	5.039	80	120	—
	USCX1	0.61	0.20	4.50	1.496	5.039	1350	2025	5400
1/2″	USCX0	0.79	0.18	4.75	0.905	5.728	80	120	—
	USCX1	0.84	0.27	4.75	2.022	5.728	1200	1800	4800
3/4″	USCX0	1.06	0.26	5.25	1.260	6.614	60	90	—
	USCX1	1.11	0.27	5.25	2.756	6.614	875	1313	3500
1″	USCX0	1.27	0.35	5.50	1.575	7.480	60	90	—
	USCX1	1.34	0.63	6.50	3.346	7.480	900	1350	3600
1 1/4″	USCX0	1.62	0.44	7.50	1.969	10.039	50	75	—
	USCX1	1.67	0.68	7.50	4.134	10.039	515	773	2060
	USCX2	1.72	0.92	7.50	4.134	10.039	800	1200	3200
1 1/2″	USCX0	1.96	0.71	8.00	2.362	11.614	36	54	—
	USCX1	2.03	1.09	8.00	5.118	11.614	435	653	1740
	USCX2	2.10	1.47	8.00	5.118	11.614	800	1200	3200
2″	USCX0	2.38	0.90	9.50	2.756	12.598	15	23	—
	USCX1	2.44	1.36	9.50	6.299	12.598	425	638	1700
	USCX2	2.50	1.82	9.50	6.299	12.598	600	900	2400

280X/286X

Construction:
T321 (280X) or ***T316L (286X)*** hose
Series 300 stainless steel braid
Helical construction

Sizes:
1/4″ through 1-1/2″

Maximum Working Pressure:
Full vacuum to 2240 psig depending on use

Temperature:
Cryogenic to 1500˚ F

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
1/4″	280	0.44	0.12	4.50	0.625	3.500	75	113	—
	281	0.51	0.18	4.50	0.625	3.500	2240	3360	8960
3/8″	280	0.59	0.16	5.50	0.825	4.000	50	75	—
	281	0.65	0.24	5.50	0.825	4.000	1374	2061	5496
1/2″	280	0.77	0.21	6.50	1.125	5.500	50	75	—
	281	0.83	0.30	6.50	1.125	5.500	1028	1542	4112
3/4″	280	1.07	0.41	7.00	1.500	6.000	30	45	—
	281	1.13	0.54	7.00	1.500	6.000	598	897	2392
1″	280	1.40	0.55	7.50	2.000	7.000	25	38	—
	281	1.46	0.73	7.50	2.000	7.000	567	851	2268
1 1/4″	280	1.73	0.91	9.00	2.500	11.500	20	30	—
	281	1.79	1.11	9.00	2.500	11.500	447	671	1788
1 1/2″	280	2.07	1.10	9.00	3.000	14.000	15	23	—
	281	2.13	1.36	9.00	3.000	14.000	392	588	1568

Monel® 400

Construction:
Monel® 400 hose and braid
Annular construction

Maximum Working Pressure:
Full vacuum up to 3025 psig depending on size

Sizes:
1/2" through 3"

Temperature:
Cryogenic to 800˚F

					500 Unbraided 502 Two Braid				501 One Braid
				MIN.LIVE	MINIMUM BEND RADIUS		MAXIMUM	MAXIMUM	NORMAL
NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	LENGTH FOR VIBRATION	STATIC BEND	DYNAMIC FLEXING	WORKING PRESSURE	TEST PRESSURE	BURST PRESSURE
1/4"	500	0.49	0.16	3.75	0.875	5.500	180	270	—
	501	0.55	0.23	3.75	0.875	5.500	2250	3375	9000
	502	0.61	0.31	3.75	0.875	5.500	3025	4535	12100
3/8"	500	0.66	0.24	4.50	1.125	6.000	140	210	—
	501	0.73	0.34	4.50	1.125	6.000	1575	2360	6300
	502	0.79	0.44	4.50	1.125	6.000	2050	3075	8200
1/2"	500	0.84	0.40	5.00	1.500	7.000	120	180	—
	501	0.90	0.51	5.00	1.500	7.000	835	1250	3340
	502	0.96	0.64	5.00	1.500	7.000	1500	2250	6000
3/4"	500	1.21	0.79	5.75	2.125	8.500	90	135	—
	501	1.27	0.96	5.75	2.125	8.500	600	900	2400
	502	1.33	1.15	5.75	2.125	8.500	1080	1620	4320
1"	500	1.53	1.02	7.00	2.750	10.000	56	85	—
	501	1.59	1.22	7.00	2.750	10.000	420	630	1680
	502	1.65	1.44	7.00	2.750	10.000	755	1130	3025
1 1/4"	500	1.86	1.61	7.50	3.250	11.500	53	80	—
	501	1.92	1.84	7.50	3.250	11.500	315	420	1270
	502	1.98	2.08	7.50	3.250	11.500	570	855	2285
1 1/2"	500	2.19	1.97	8.00	3.750	13.000	37	55	—
	501	2.29	2.55	8.00	3.750	13.000	565	850	2260
	502	2.39	3.16	8.00	3.750	13.000	1015	1526	4060
2"	500	2.83	2.63	9.50	5.000	16.000	20	30	—
	501	2.93	3.37	9.50	5.000	16.000	415	620	1660
	502	3.03	4.11	9.50	5.000	16.000	745	1015	2985
3"	500	3.57	1.69	9.00	8.250	21.000	4	6	—
	501	3.67	2.50	9.00	8.250	21.000	225	335	900
	502	3.77	3.32	9.00	8.250	21.000	425	635	1700

Monel® Slip-On Braid Specifications

TYPICAL HOSE O.D. (IN.)	NOMINAL HOSE I.D. (IN.)	BRAID I.D. (IN.)	BRAID CONSTRUCTION	BRAID ANGLE	COVERAGE (%)	WORKING PRESSURE (PSIG)	WEIGHT (LB/FT)
0.49	1/4	0.48	24x5x.0126	52	84.0	1665	0.07
0.66	3/8	0.66	24x7x.0126	52	86.1	1160	0.10
0.84	1/2	0.84	24x8x.0126	52	80.8	830	0.12
1.21	3/4	1.20	48x6x.0126	52	83.7	605	0.17
1.53	1	1.53	48x8x.0126	52	86.2	415	0.23
1.86	1 1/4	1.86	48x10x.0126	52	97.6	315	0.29
2.19	1 1/2	2.19	48x8x.020	52	90.8	570	0.58
2.83	2	2.83	48x10x.020	52	89.5	415	0.73
3.57	3	3.57	48x10x.020	45	94.3	185	0.64

Inconel® 625

Construction:
Inconel® 625 hose
T321 braid (Inconel braid also available)
Annular construction

Sizes:
1/4" through 4"
**** Contact factory for other grades***

Maximum Working Pressure:
Full vacuum up to 2660 psig depending on size and braid construction

Temperature:
Cryogenic to 1500˚F with T321 braid
Cryogenic to 1800˚F with Inconel braid

INC00 Unbraided INC01 Single Braid

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
1/4"	INC00	0.49	0.11	3.50	0.875	5.000	228	342	
	INC01	0.55	0.18	3.50	0.875	5.000	2660	3990	10640
3/8"	INC00	0.66	0.15	4.25	1.125	5.500	150	225	
	INC01	0.73	0.23	4.25	1.125	5.500	1610	2415	6440
1/2"	INC00	0.84	0.21	4.50	1.500	6.000	79	119	
	INC01	0.90	0.32	4.50	1.500	6.000	1310	1965	5240
3/4"	INC00	1.21	0.34	5.50	2.125	8.000	32	48	
	INC01	1.27	0.50	5.50	2.125	8.000	915	1373	3660
1"	INC00	1.53	0.59	6.50	2.750	9.000	38	57	
	INC01	1.59	0.78	6.50	2.750	9.000	645	968	2580
1 1/4"	INC00	1.86	0.78	7.00	3.250	10.500	22	33	
	INC01	1.92	1.02	7.00	3.250	10.500	545	818	2180
1 1/2"	INC00	2.19	0.93	7.50	3.750	12.000	26	39	
	INC01	2.27	1.27	7.50	3.750	12.000	560	840	2240
2"	INC00	2.72	1.23	7.75	5.000	15.000	14	21	
	INC01	2.80	1.68	7.75	5.000	15.000	460	675	1800
2 1/2"	INCO0	3.11	1.08	11.00	7.000	16.000	7	10	
	INCO1	3.23	1.87	11.00	7.000	16.000	545	815	2180
3"	INC00	3.57	1.07	9.00	8.250	17.000	5	7.5	
	INC01	3.69	1.93	9.00	8.250	17.000	440	660	1760
4"	INC00	4.72	2.57	10.75	11.000	27.000	4	6	
	INC01	4.84	3.53	10.75	11.000	27.000	270	405	1080

Hastelloy® C276

Construction:
Hastelloy® hose
Series 300 stainless steel or Hastelloy braid
Annular construction

Sizes:
1/2" through 2"

Maximum Working Pressure:
Full vacuum to 1550 psig depending on size and braid construction

Temperature:
Cryogenic to 2000˚F with Hastelloy braid
Cryogenic to 1500˚F with T321 stainless steel braid

HAS00 Unbraided HAS01 One Braid

NOMINAL HOSE I.D.	HOSE TYPE	HOSE O.D.	WEIGHT PER FT.	MIN.LIVE LENGTH FOR VIBRATION	MINIMUM BEND RADIUS STATIC BEND	MINIMUM BEND RADIUS DYNAMIC FLEXING	MAXIMUM WORKING PRESSURE	MAXIMUM TEST PRESSURE	NORMAL BURST PRESSURE
1/2"	HAS00	0.84	0.31	4.50	1.500	6.000	80	120	-
	HAS01	0.90	0.42	4.50	1.500	6.000	1550	2325	6200
3/4"	HAS00	1.21	0.49	5.50	2.130	8.000	70	105	-
	HAS01	1.27	0.67	5.50	2.130	8.000	915	1370	3660
1"	HAS00	1.53	0.80	6.50	2.750	9.000	43	65	-
	HAS01	1.59	0.98	6.50	2.750	9.000	645	965	2580
1 1/4"	HAS00	1.86	1.05	7.00	3.250	10.500	29	42	-
	HAS01	1.92	1.29	7.00	3.250	10.500	575	860	2300
1 1/2"	HAS00	2.19	1.59	7.50	3.750	12.000	31	47	-
	HAS01	2.27	1.97	7.50	3.750	12.000	585	875	2340
2"	HAS00	2.83	2.08	9.00	5.000	15.000	17	26	-
	HAS01	2.91	2.55	9.00	5.000	15.000	470	705	1880

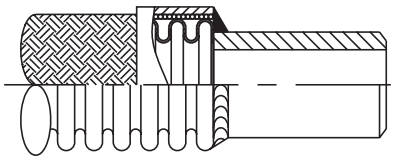
Welded Pipe End with 37-1/2 degree bevel

Size Availability: 1/8" diameter to 12" diameter

Material Availability: Carbon Steel, T304 Stainless Steel, T304L Stainless Steel, T321 Stainless Steel, T316 Stainless Steel, T316L Stainless Steel

Schedule Availability: 5, 10, 40, 80, 160, XX

Note: Not all sizes and schedules are available in combination - consult factory for details



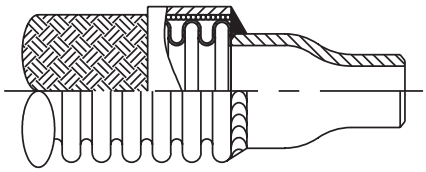
Welded Concentric Reducer

Size Availability: 1/2" diameter to 12" diameter and combinations thereof

Material Availability: Carbon Steel, T304 Stainless Steel, T304L Stainless Steel, T321 Stainless Steel, T316 Stainless Steel, T316L Stainless Steel, Monel 400, Hastelloy, Incoloy, Inconel

Schedule Availability: 5, 10, 40, 80, 160, XX

Note: Not all sizes and schedules are available in combination - consult factory for details



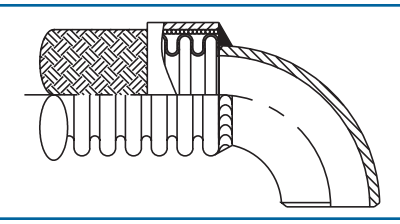
Welded Long Radius 90 Degree Elbow

Size Availability: 1/2" diameter to 12" diameter

Material Availability: Carbon Steel, T304 Stainless Steel, T304L Stainless Steel, T321 Stainless Steel, T316 Stainless Steel, T316L Stainless Steel, Monel 400, Hastelloy, Incoloy, Inconel

Schedule Availability: 5, 10, 40, 80, 160, XX

Note: Not all sizes and schedules are available in combination. Short radius, 45's and other angles are available - consult factory for details



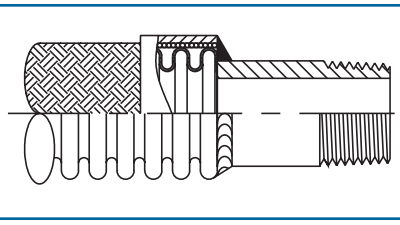
Welded NPT male nipple

Size Availability: 1/8" diameter to 8" diameter

Material Availability: Carbon Steel, T304 Stainless Steel, T304L Stainless Steel, T321 Stainless Steel, T316 Stainless Steel, T316L Stainless Steel

Schedule Availability: 5, 10, 40, 80, 160, XX

Note: Not all sizes and schedules are available in combination - consult factory for details



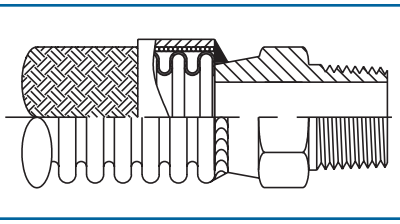
NPT Male Nipple with Integral Hex Nut

Size Availability: 1/4" diameter to 2" diameter

Material Availability: Carbon Steel, T304 Stainless Steel, T304L Stainless Steel, T321 Stainless Steel, T316 Stainless Steel, T316L Stainless Steel, Monel 400, Hastelloy, Incoloy, Inconel

Schedule Availability: 40, 80, 160, XX

Note: Not all sizes, schedules and materials are available in combination - consult factory for details



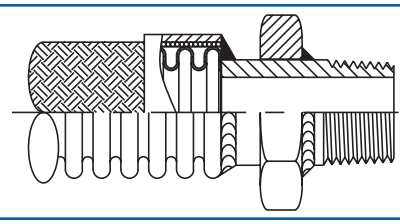
NPT male with welded on Hex Nut

Size Availability: 1/2" diameter to 4" diameter

Material Availability: Carbon Steel, T304 Stainless Steel, T304L Stainless Steel, T321 Stainless Steel, T316 Stainless Steel, T316L Stainless Steel, Monel 400, Hastelloy, Incoloy, Inconel

Manufactured from hexagon bar stock.

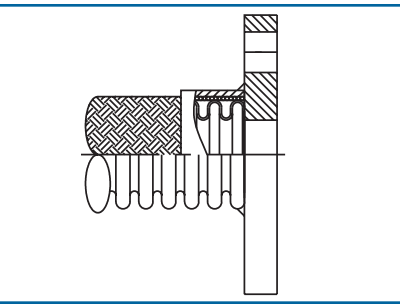
Note: Not all sizes, and materials are available in combination - consult factory for details

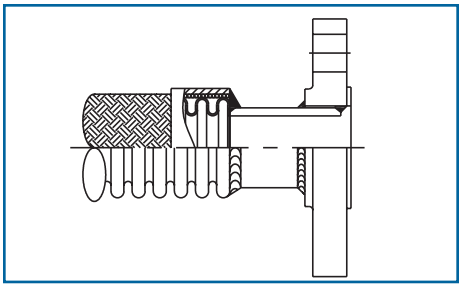


Welded Plate Flange ANSI Class 150 drilling

Size Availability: 1/2" diameter to 12" diameter

Material Availability: Carbon Steel and Stainless Steel





Raised Face Slip-On Flange on Pipe End

Size Availability: 1/2" diameter to 12" diameter

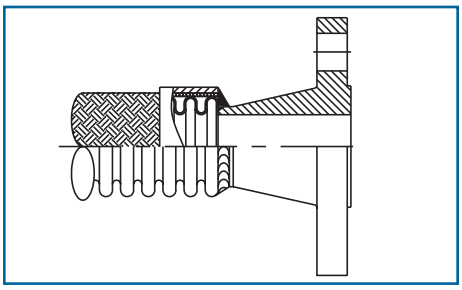
Material Availability: Carbon Steel, T304 Stainless Steel, T304L Stainless Steel, T321 Stainless Steel, T316 Stainless Steel, T316L Stainless Steel, Monel 400, Hastelloy, Inconel

Schedule Availability: 5, 10, 40, 80, 160, XX

ANSI Class Ratings: 150, 300, 600, 900, 1500, 2500

RTJ flanges also available - consult factory for details

Note: Not all sizes and schedules are available in combination - consult factory for details



Welded Raised Face Weldneck Flange

Size Availability: 1/2" diameter to 12" diameter

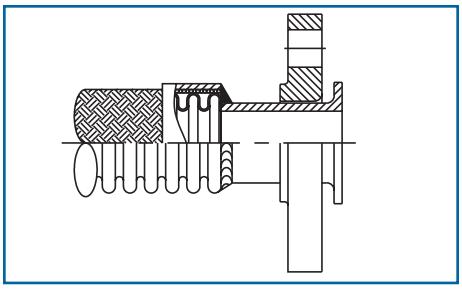
Material Availability: Carbon Steel, T304 Stainless Steel, T304L Stainless Steel, T321 Stainless Steel, T316 Stainless Steel, T316L Stainless Steel, Monel 400, Hastelloy, Incoloy, Inconel

Schedule Availability: 5, 10, 40, 80, 160, XX

ANSI Class Ratings: 150, 300, 600, 900, 1500, 2500

RTJ flanges also available - consult factory for details

Note: Not all sizes and schedules are available in combination - consult factory for details



Lap Joint Floating Flange with Type "A" MSS stub end

Size Availability: 1/2" diameter to 12" diameter

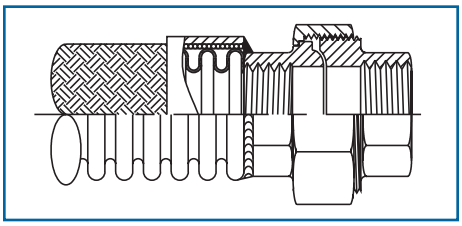
Material Availability: Carbon Steel, T304 Stainless Steel, T304L Stainless Steel, T321 Stainless Steel, T316 Stainless Steel, T316L Stainless Steel, Monel 400, Hastelloy, Incoloy, Inconel

Schedule Availability: 5, 10, 40, 80, 160, XX

ANSI Class Ratings: 150, 300, 600, 900, 1500, 2500

Note: Not all sizes and schedules are available in combination.

Type "C" stub ends are also available - consult factory for details.

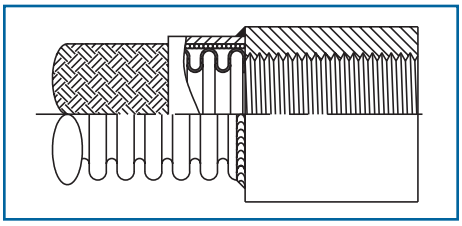


Welded Female Union

Size Availability: 1/2" diameter to 4" diameter

Material Availability: Carbon Steel, T304 Stainless Steel, T304L Stainless Steel, T316 Stainless Steel, T316L Stainless Steel

Pressure: 150, 300, 3000, 6000 pound



Welded Female NPT Half Pipe Coupling

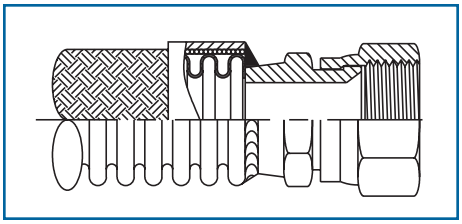
Size Availability: 1/2" diameter to 4" diameter

Material Availability: Carbon Steel, T304 Stainless Steel, T304L Stainless Steel, T321 Stainless Steel, T316 Stainless Steel, T316L Stainless Steel, Monel 400, Hastalloy, Incoloy, Inconel

Pressure: 150, 300, 3000, 6000 pounds

Note: Not all sizes and Pressures are available in combination.

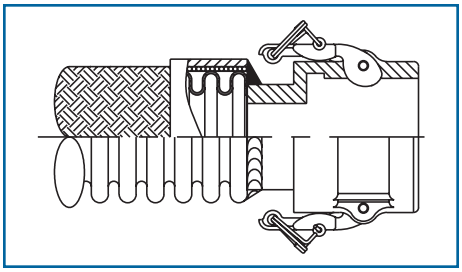
Female NPT Full Pipe Coupling is also available - consult factory for details



Welded JIC Swivel Female

Size Availability: 1/4" diameter to 2" diameter

Material Availability: Carbon Steel & T316 Stainless Steel

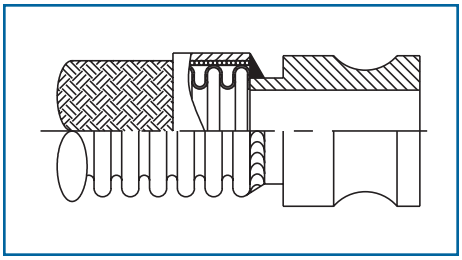


Welded Quick Disconnect Female Part "D" Coupler

Size Availability: 1/2" diameter to 8" diameter

Material Availability: Carbon Steel & T316 Stainless Steel, Hastelloy
- Other materials are available - consult factory for details

Note: Not all sizes and materials are available in combination - consult factory for details



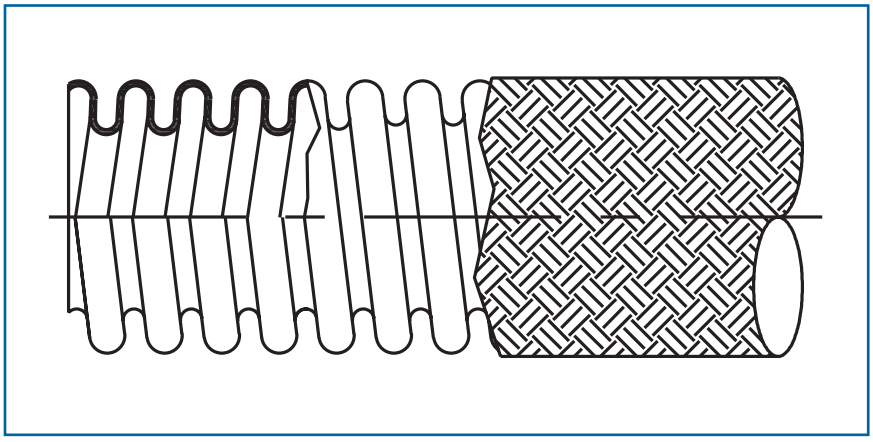
Welded Quick Disconnect Male Part "A" Camlock

Size Availability: 1/2" diameter to 8" diameter

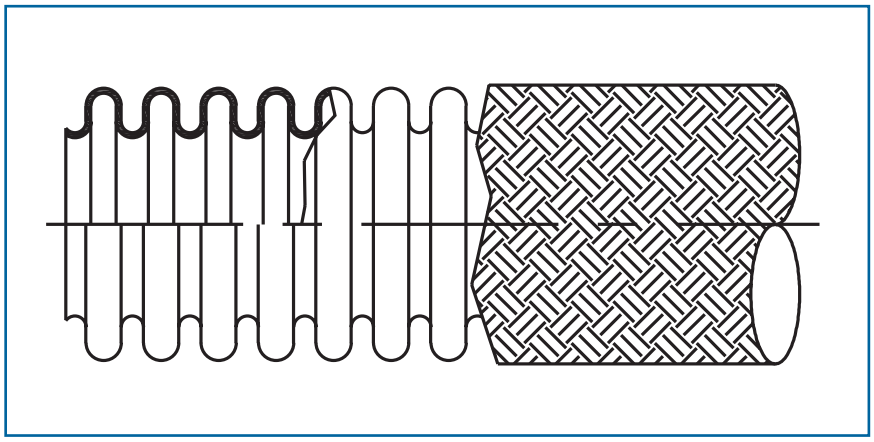
Material Availability: Steel, T316 Stainless Steel and Hastelloy
- other materials available - consult factory for details

Note: Not all sizes and materials are available in combination - consult factory for details

Helical Hose Construction in Profile with Single Layer of Braid



Annular Hose Construction in Profile With Single Braid



I. PRESSURE

US Hose pressure ratings are in accordance with industry-wide good practice and are consistent with the requirements of the USA Standard Code for Pressure Piping and the ASME Boiler and Pressure Vessel Code, Sec. VIII.

Maximum Working Pressure
Maximum operating pressure to which the hose should be subjected. It is established at 25% of the Nominal Design Burst Pressure. The hose may be deflected within the specified bend radius range.

Maximum Proof Pressure
Maximum test pressure to which the hose should be subject. It is established at 150% of the Maximum Working Pressure with the hose installed straight. No harmful deformation shall occur.

Hydrostatic field tests of hose assemblies installed in varying degrees of radial bend or parallel offset should be limited to 120% of the maximum rated working pressure at 70°F, or 150% of the actual operating pressure, whichever is lower.

Nominal Design Burst Pressure
The pressure at which the hose can be expected to rupture, based on the minimum annealed ultimate tensile strength of the braid wire and corrugated hose alloys at 70°F and the hose installed straight.

Pulsating or Shock Pressures
When pulsating, surge or shock pressures exists, such as occur due to fast closing valves, the peak pressure shall not exceed 50% of the Maximum Working Pressure. Installation shall be such that there is no initial slack in the braid when the pressure pulse, surge or shock occurs.

Pressure Relative To Unbraided Hose
At Maximum Working Pressure, 1 to 2½% elastic elongation will occur in unbraided hose assemblies. To avoid squirm, unbraided hose should be unrestrained at one end, or installed in such a manner as to allow free axial expansion due to pressure, as in a 180° loop.

Pressure Relative To Braided Hose
Whenever appreciable internal pressure is applied to a corrugated metal hose, it will elongate unless restrained. Generally this restraint is provided by a wire braid sheath over the hose. The braid has little effect on bending or flexibility of the hose. However, in extremely short lengths of braided and pressurized hose, additional bending forces are required because of braid friction.

Where the strength of the braid sheath is the limiting factor, additional working pressure may be gained by using a heavier than standard single braid, or two or more braids. However, when the hoop rupture strength of the corrugated hose is the limiting factor, no additional pressure resistance is gained with additional braids.

Contact US Hose Engineering Group for braid/hose design assistance to determine maximum pressure ratings at lowest total cost for an application.

Pressure Relative To Temperature
For operating temperatures in excess of 70°F, the tabulated pressures must be decreased in accordance with the "Conversion Factors" listed in the table below. Since the pressure ratings are based on annealed material properties, no reduction in pressure ratings is necessary for fitting attachment by TIG welding, brazing, or soft solder.

Conversion Factors
Apply to pressure rating for elevated temperatures.

TEMPERATURE		MATERIAL				
C°	F°	STAINLESS STEEL	STEEL	MONEL	BRONZE	INCONEL
20	70	1.00	1.00	1.00	1.00	1.00
66	150	0.97	0.99	0.93	0.92	0.97
93	200	0.94	0.97	0.90	0.89	0.94
121	250	0.92	0.96	0.87	0.86	0.92
150	300	0.88	0.93	0.83	0.83	0.88
177	350	0.86	0.91	0.82	0.81	0.86
200	400	0.83	0.87	0.79	0.78	0.83
232	450	0.81	0.86	0.77	0.75	0.81
260	500	0.78	0.81	0.73	—	0.78
316	600	0.74	0.74	0.72	—	0.74
371	700	0.70	0.66	0.71	—	0.70
427	800	0.66	0.52	0.70	—	0.66
482	900	0.62	0.50	—	—	0.62
538	1000	0.60	—	—	—	0.60
593	1100	0.58	—	—	—	0.58
649	1200	0.55	—	—	—	0.55
704	1300	0.50	—	—	—	0.50
760	1400	0.44	—	—	—	0.44
815	1500	0.40	—	—	—	0.40
982	1800	0.40	—	—	—	0.40

Consult US Hose Engineering Group whenever service conditions necessitate consideration of the influence of long time exposure at elevated temperature. Consult factory for maximum temperature of Hastelloy materials.

II. MAXIMUM SERVICE TEMPERATURE OF MATERIAL

Maximum Service Temperature

ALLOY	MAXIMUM TEMP. °F.	ALLOY	MAXIMUM TEMP. °F.
Hastelloy® C-276	2000		
Inconel® 625	1800	Brazing (RCuZn-C or BCuP-2)	
AISI Stainless Steel Type:		Bronze Hose	450
321	1500		
316 ELC	1500	Silver Brazing	
304L	1500	(AWS-BAg-2)	600
304	850		
302	850	Aluminum 52S-0 (5052-0)	600
Mild Steel	850	Galvanizing	450
Malleable Iron	800	Soft Solder (Pb: 60, Sn: 40)	250
Monel®	800	(Pb: 95, Sn: 5)	350
Bronze	450	Silicone Coated Fiberglass	600
Brass	450	Aluminized Fiberglass	1000
Copper	400		

Consult US Hose Engineering Group whenever service conditions necessitate consideration of the influence of long time exposure at elevated temperature.

III. FLOW VELOCITY

1) Where flow velocity exceeds 100 ft/sec gas (50 ft/sec liquid), in unbraided hose, or 150 ft/sec gas (75 ft/sec liquid), in braided hose, a flexible metal liner of fully interlocked (RT) hose should be used. When the hose is installed in a bent condition, these flow values should be reduced by 50% for a 90° bend, 25% for a 45° bend, and so on, proportional to the angle of bend. In cases where velocity exceeds the above values, the next larger size corrugated hose should be used with the flexible RT liner size equivalent to the mating pipe size.

2) Where the amount of pressure drop through longer lengths of hose is a significant factor, a larger diameter hose may be required. As a broad rule of thumb, pressure drop through a corrugated metal hose is approximately three times that in comparable size standard steel pipe. For more accurate calculations of pressure drop, consult US Hose Engineering Group.

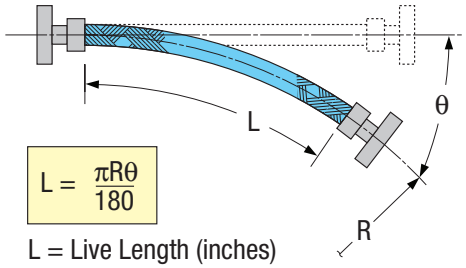
IV. MOTION

Most industrial applications can be reduced to one of five classes of motion: 1) **Angular;** 2) **Axial;** 3) **Offset;** 4) **Radial;** or 5) **Random.**

1. Angular Motion:

Motion that occurs when one end of a hose assembly is deflected in a simple bend with the ends not remaining parallel. Angular motion may be incorporated in an installation to accommodate misalignment and vibration only, but must not be used to accommodate expansion that would result in unloading the braid.

2. Axial Motion:



$$L = \frac{\pi R \theta}{180}$$

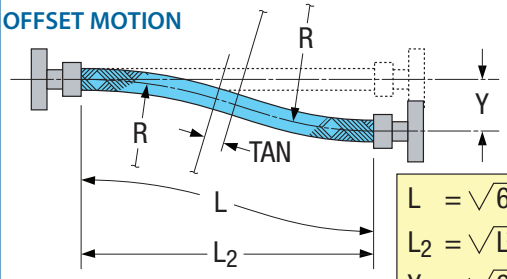
L = Live Length (inches)
R = ℄ Bend Radius (inches)
θ = Angle of Bend (degrees)
π = 3.1416

This type of motion occurs when one end of a hose assembly is deflected along its longitudinal axis. Axial motion is applicable to annular corrugated, unbraided flexible hose only. Neither helical hose nor braided hose should be used in axial motion applications.

3. Offset Motion:

Motion that occurs when one end of the hose assembly is deflected in a plane perpendicular to the longitudinal axis with the end remaining parallel. Offset is measured in inches of displacement of the free end center line from the fixed end center line. In offset motion applications, the offset should never be greater than one-fourth (25%) of the minimum center line bend radius.

OFFSET MOTION



Please refer to chart for live length of hose in offset on page 25

$$L = \sqrt{6YR + Y^2}$$
$$L_2 = \sqrt{L^2 - Y^2}$$
$$Y_M = \sqrt{9R^2 + L^2} - 3R$$

L = Hose Live Length (inches)
L_2 = Projected Linear Length At Offset (inches)
R = ℄ Bend Radius (inches)
Y = ℄ Offset, Motion (inches)
Y_M = ℄ Maximum offset for a given L and R (inches)

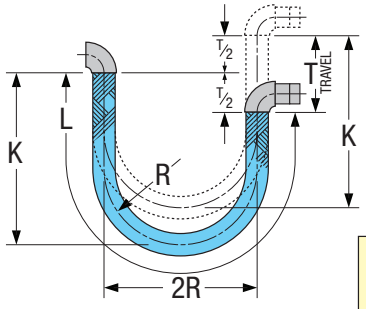
NOTE: Where Offset Motion "Y" occurs both sides of ℄ the Hose Live Length should be based on Total Travel or 2 times Y.

4. Radial Motion:

This type of motion occurs when the center line of a hose assembly is bent in a circular arc. In industrial applications, radial motion is most commonly found in traveling loops.

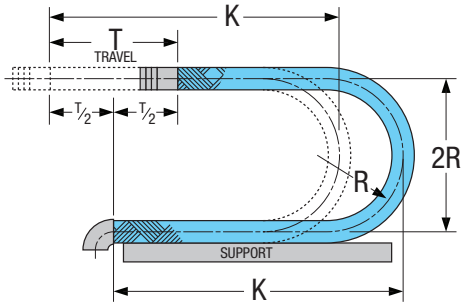
CLASS "A" TRAVELING LOOPS

...For Maximum Vertical Travel



$$L = 4R + T/2$$
$$K = 1.43R + T/2$$

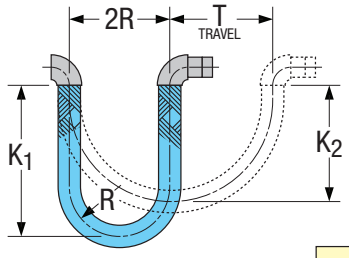
...For Maximum Horizontal Travel



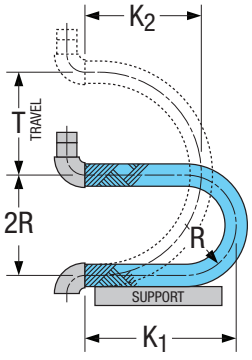
Center line bend radius (in.) K = Loop Length (in.)

CLASS "B" TRAVELING LOOPS

...For Short Horizontal Travel



...For Short Vertical Travel

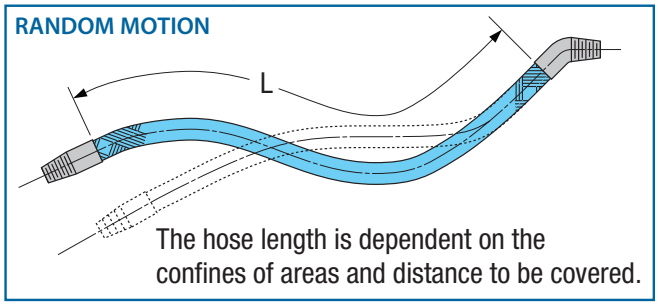


$$L = 4R + 1.57T$$
$$K_1 = 1.43R + .785T$$
$$K_2 = 1.43R + T/2$$

NOTE:
In loop installations both connections and travel should be in same plane as bend.

5. Random Motion:
Non-predictable motion that occurs from manual handling of a assembly. Loading and unloading hose would generally fall into this category. Abusive handling of hose is an important factor to consider in applications involving random motions. The use of an interlocked (RT-6) guard over the corrugated hose is recommended to protect the hose assembly from rough handling and "over-bending" adjacent to the fittings.

V. MOTION FREQUENCY



The frequency of a particular class of motion to which a flexible metal hose may be subjected by repeated flexing or bending. The frequency of motion may be divided into three basic categories: namely vibration, dynamic, and continuous. The minimum live length required for these motion categories may be selected as follows:

1. Vibration:
For the normal vibration encountered in industrial applications, such as pump and compressor discharge lines and engine exhaust installations, the hose live lengths should be taken from the Minimum Live Length For Vibration column on Technical Data Pages.

Normal vibration is shown as the unshaded area of the chart below. If the expected combination of double amplitude (total motion excursion) and frequency falls into the shaded area, consult US Hose Engineering Group.

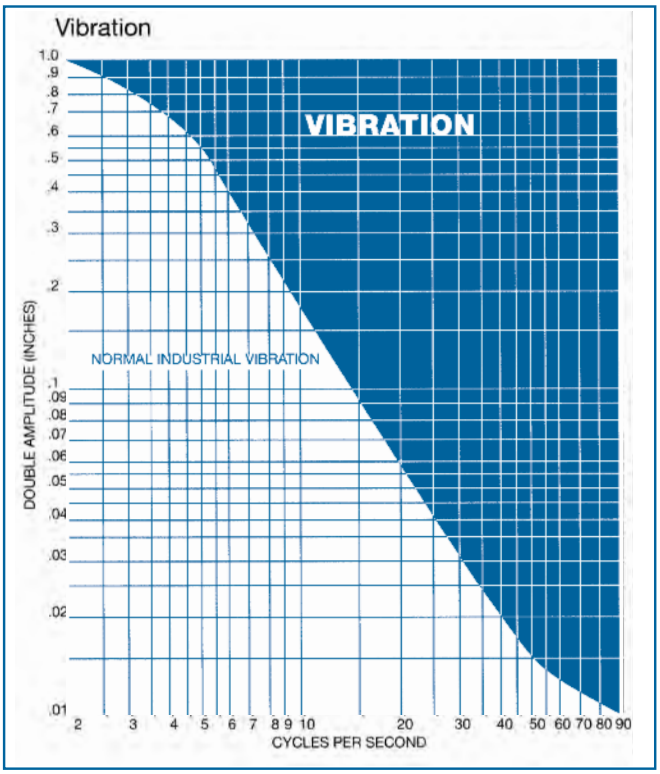
Caution: Avoid hose resonance. If resonance is anticipated, consult US Hose Engineering Group.

2. Dynamic Motion:
Motion that occurs on a regular or irregular basis normally the result of thermal expansion and contraction or other noncontinuous actions.

The dynamic flexing bend radius shown on Hose Technical Data Pages shall be used in the formulas for angular, radial and offset motion when determining hose live length for dynamic motion.

3. Continuous Motion:
Motion that occurs on a regular cyclic basis normally at a slow cyclic rate and constant travel. For Continuous Lateral Offset Motion double the minimum centerline bend radius for Dynamic Flexing shown on Hose Technical Data Pages.

4. Static Bend:
The minimum center line bend radius to which a flexible metal hose may be bent for installation. No further motion is to be imposed other than normal vibration.



VI. CYCLE LIFE

The cycle life expectancy of a metal hose is affected by various factors such as: operating pressure, operating temperature, materials, bend radius (the movement per corrugation due to the flexure), the thickness of the corrugation. Any change in one of these factors will result in a change in the cycle life of a metal hose assembly.

The cycle life of a metal hose assembly is proportional to the sum of the pressure stress range and deflection stress range. The life expectancy can be defined as the total number of competed cycles which can be expected from the metal hose assembly based on S/N curves and data tabulated from tests performed under simulated operating conditions. A cycle is defined as one complete movement from the initial position in the system to some operating point and returning to the original position.

This information should be used as a guide only. We cannot predict every variable which might be encountered in every application nor any misapplication, mechanical damage, and/or any uncontrollable situation.

Chart for Live Length of Hose in Offset

CenterLine
Radius
Inches*Dynamic Offset Motion • Maximum Distance from Centerline • See Sketch, Page 24

	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/2"	2"	3"	4"	5"	6"	8"	10"
2	1 1/4	1 3/4	2 1/4	2 1/2	3 1/4	3 3/4	4 1/4	5 1/4	6 3/4	8	9 1/4	10 1/2	11 3/4	15
4	1 3/4	2 1/2	3	3 1/2	4 1/2	5	6 1/4	7 1/4	9	10 3/4	12	13 1/2	16	18 1/2
6	2 1/4	3 1/4	3 3/4	4 1/4	5 1/4	6 1/4	7 1/2	8 3/4	10 3/4	12 3/4	14 1/4	16	19	21 1/2
8	2 1/2	3 1/2	4 1/4	5	6	7	8 3/4	10	12 1/2	14 1/2	16 1/4	18	21 1/4	24 1/4
10	2 3/4	4	4 3/4	5 1/2	6 3/4	8	9 3/4	11 1/4	13 3/4	16	18	20	23 1/2	26 1/2
12	3	4 1/4	5 1/4	6	7 1/2	8 1/2	10 1/2	12 1/4	15	17 1/2	19 1/2	21 1/2	25 1/2	28 3/4
14	3 1/4	4 3/4	5 3/4	6 1/2	8	9 1/4	11 1/4	13 1/4	16 1/4	18 3/4	21	23 1/2	27 1/4	30 3/4
16	3 1/2	5	6	7	8 1/2	10	12 1/4	14	17 1/4	20	22 1/2	25	29	32 3/4
18	3 3/4	5 1/4	6 1/2	7 1/2	9	10 1/2	13	15	18 1/4	21 1/4	24	26	30 1/2	34
20	4	5 1/2	6 3/4	7 3/4	9 1/2	11	13 1/2	15 3/4	19 1/4	22 1/2	25	27 1/2	32 1/4	36 1/4
25	4 1/2	6 1/4	7 1/2	8 3/4	10 3/4	12 1/4	15	17 1/2	21 1/2	25	28	30 1/2	35 3/4	40
30	4 3/4	6 3/4	8 1/4	9 1/2	11 3/4	13 1/2	16 1/2	19	23 1/2	27 1/4	30 1/2	33 1/2	39	43 3/4
35	5 1/4	7 1/4	9	10 1/4	12 1/2	14 1/2	18	20 3/4	26 1/4	29 1/2	32 3/4	36	42	47
40	5 1/2	7 3/4	9 1/2	11	13 1/2	15 1/2	19	22	27	31 1/4	35	38 1/2	44 3/4	50
45	6	8 1/4	10	11 3/4	14 1/4	16 1/2	20 3/4	23 1/2	28 1/2	33 1/4	37	41	47 1/2	53
50	6 1/4	8 3/4	10 3/4	12 1/4	15	17 1/2	21 1/4	24 1/2	30	35	39	43	50	56
60	6 3/4	9 1/2	11 3/4	13 1/2	16 1/2	19	23 1/4	27	33	38 1/4	43	47	54 1/4	61
70	7 1/4	10 1/4	12 3/4	14 3/4	17 3/4	20 1/2	25 1/4	29	35 1/2	41 1/2	46	51	58 3/4	65 3/4
80	7 3/4	11	13 1/2	15 1/2	19	22	27	31	38	44	49 1/2	54	62 3/4	70
90	8 1/4	11 3/4	14 1/4	16 1/2	20 1/4	23 1/2	28 1/2	33	40 1/2	46 3/4	52	57 1/4	66 1/4	74 1/4
100	8 3/4	12 1/4	15	17 1/2	21 1/4	24 1/2	30	35	42 1/2	49 1/4	55	60 1/2	69 3/4	78 1/4
110	9 1/4	13	15 3/4	18 3/4	22 1/2	25 3/4	31 3/4	36 1/2	44 3/4	51 1/2	58	63 1/4	73 1/4	82
120	9 1/2	13 1/2	16 1/2	19	23 1/4	27	33	38 1/4	46 3/4	54	60 1/2	66	76 1/2	85 1/2
130	10	14	17 1/4	20	24 1/4	28	34 3/4	39 3/4	48 1/2	56	62 3/4	68 3/4	79 1/2	89

*Refer to hose technical pages

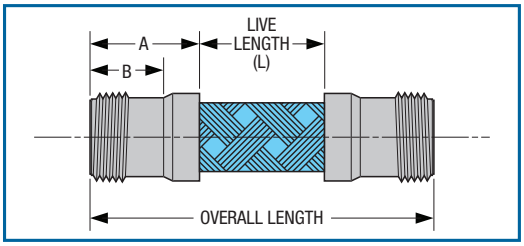
IMPORTANT NOTE:

The values shown are minimum live lengths for most centerline bend radii and total offset travel combinations. If the exact radius or travel are not shown on the chart, then the next larger value may be used or use the lateral offset formula. The values as shown in the shaded portion are applicable to static bends only. The offset motion should never be greater than 1/4 (25%) of the centerline bend radius.

Assembly Length (Live Length and Over-all Length)

After the hose is selected for the application, the live length and over-all length of the assembly must be determined to complete the design. The live length is the flexible portion of an assembly and can be determined for the class of motion from the diagrams and for vibration.

After the live length has been determined, the overall length is calculated by adding the dimensions for the end fittings. Refer to factory for fitting lengths as standard and special lengths can be offered.



Laboratory Corrosion Chart

US HOSE TITEFLEX

Index to Laboratory Corrosion Data Chart

I. <.00035 inches in penetration/month – Corrosion Rate –Resistant – Class 1
.00035-.0035 inches of penetration/month – Corrosion Rate –Partially Resistant – Class 2
>.0035 inches of penetration/month – Corrosion Rate –Not Resistant – Class 3

II. *Subject to decomposition (forming HCl) in presence of moisture
**Subject to pitting at air line or when allowed to dry
***Subject to attack in presence of H_2SO_4

Typical 18-8 Stainless Steels are Types 304, 304L, 321 and 347

Typical 18-8 Mo. Stainless Steels are Types 316 and 316L

(Contact factory for other alloy recommendations)

Chemical	Temp. °F	Stainless Steel 18-8	Stainless Steel 18-8 Mo.	Mild Steel	Brass (80-20)	Bronze (Phos.)	Monel
Acetic Acid 5%-20% Agitated							
or Aerated	70°	1	1	3	3	3	2
50%	70°	1	1	3	3	3	3
50% - 80%	Boiling	3	2	3	3	3	3
80%	70°	1	1	3	3	3	1
100%	70°	1	1	3	3	3	1
100%	Boiling	3	2	3	3	3	2
100% – 150 lbs. pressure	400°	3	3	3	3	3	2
Acetic Anhydride	70°	1	1	3	3	3	2
	Boiling	1	1	3	3	3	2
Acetic Acid Vapors, 30%	Hot	3	2	3	3	3	3
100%	Hot	3	3	3	3	3	2
Acetone	Boiling	1	1	3	1	1	1
Acetyl Chloride	Cold	2	2	3	2	2	1
	Boiling	2	2	3	2	2	3
Acetylene Concentrated	70°	1	1	3	1	1	1
Commercially Pure	70°	1	1	1	3	3	1
Acid Salt Mixture							
10% H_2SO_4 Sp. G. 1.07 +							
10% $CuSO_4 \cdot 5\ H_2O$	Boiling	1	1	3	3	3	3
Acid Salt Mixture							
10% H_2SO_4 Sp. G. 1.07 +							
2% $FeSO_4 \cdot 7\ H_2O$	Boiling	1	1	3	3	3	3
Alcohol, Ethyl, 70° & Boiling	70°	1	1	1	1	1	1
Alcohol, Methyl	70°	1	1	1	1	1	1
	(150°)						
	Boiling	3**	2	3	1	1	1
Aluminum, Molten	1400°	3	3	3	3	3	3
Aluminum Acetate, Saturated	70° &						
	Boiling	1	1	3	3	3	1
Aluminum Chloride							
10% Quiescent	70°	3	3	3	3	3	2
25% Quiescent	70°	1	1	3	3	3	2
Aluminum Fluoride	70°	3	3	3	3	3	2
Aluminum Hydroxide, Saturated	70°	1**	1	1**	1	1	1
Aluminum Sulphate, 5%	150°	1**	1	3	3	3	1
10%	70°	1**	1	3	3	3	1
10%	Boiling	2**	1	3	3	3	1
Saturated	70°	1**	1	3	3	3	1
Saturated	Boiling	2**	1	3	3	3	1
Aluminum Potassium Sulphate							
(Alum) 2% - 10%	70°	1	1	3	2	2	2
10%	Boiling	2	1	3	3	3	2
Saturated	Boiling	3	2	3	3	3	2
Ammonia (Anhydrous)							
All Concentrations	70°	1	1	1	1	1	1
Gas	Hot	3	3	3	3	3	
Ammonia Liquor	70°	1	1	3	3	3	3
	Boiling	1	1	3	3	3	3
Ammonium Bicarbonate	70°	1	1	3	3	3	2
	Hot	1	1	3	3	3	2
Ammonium Bromide	70°	2	1	3	3	3	2
Ammonium Carbonate 1 & 5%	70°	1	1	1	3	3	3
Ammonium Chloride 1%	70°	1	1	2	3	3	1
10%	Boiling	1**	1**		3	3	2
28%	Boiling	2**	1**		3	3	2
50%	Boiling	2**	1**		3	3	2
Ammonium Hydroxide							
All Concentrations	70°	1	1	2	3	3	3
Ammonium Monophosphate	70°	1	1	2	3	3	2
Ammonium Nitrate							
All Concentrate Agitated	70°	1	1	3	3	3	2
All Concentrate Aerated	70°	1	1	3	3	3	2
All Concentrate Saturated	Boiling	1	1	3	3	3	2
Ammonium Oxalate 5%	70°	1	1	2	3	3	-
Ammonium Perchlorate 10%	Boiling	1	1	2	3	3	-
Ammonium Persulphate 5%	70°	1	1		3	3	3
Ammonium Phosphate 5%	70°	1	1	2	3	3	3
Ammonium Sulphate							
1% Aerated or Agitated	70°	1	1	3	3	3	2
Ammonium Sulphate							
5% Aerated & Agitated	70°	1	1	3	3	3	2
10% & Saturated	Boiling	2**	1**	3	3	3	2
Ammonium Sulphite, 70° &							
Boiling	70°	1	1	3	3	3	3
Amyl Acetate Concentrate	70°	1	1	2	1	1	1
Amyl Chloride	70°	1	1	3	2	2	2
Aniline							
3%	70°	1	1	2	3	3	2
Concentrated Crude	70°	1	1	1	3	3	2
Aniline Hydrochloride	70°	3	3		3	3	3
Antimony Trichloride	70°	3	3	3	3	3	3
Barium Carbonate	70°	1	1	2	1	1	2
Barium Chloride							
5% & Saturated	70°	1	1	3	2	2	2
Barium Hydroxide							
Aqueous Solution	Hot	1	1	2	1	1	2
Barium Nitrate							
Aqueous Solution	Hot	1	1	2			-
Barium Sulphate							
(Barytes-Blanc Fixe)	70°	1	1		1	1	2
Barium Sulfide							
Saturated Solution	70°	1	1	3	3	3	-
Beer (Barley Malt & Hops)	70°	1	1	3	1	1	1
3.5% - 4.5% Alcohol	160°	1	1	3	1	1	1
Benzene (Benzol) 70° or Hot	70°	1	1	2	1	1	2
Benzoic Acid	70°	1	1	1	1	1	-
Blood (Meat Juices)	Cold	1**	1	2			2
Borax 5%	Hot	1	1	2	1	1	2
Boracic Acid 5%	Hot or						
	Cold	1	1				
Boric Acid,							
5% Solution, 70° or Hot	70°	1	1	3	1	1	2
5% Solution	Boiling	1	1**	3	2	1	2
Saturated Solution	70°	1**	1**	3	3	2	2
Saturated Solution	Boiling	1**	1**	3	3	3	2
Bromine, Bromine Water	70°	3	3	3	3	3	3
Buttermilk	70°	1	1	3	3	3	2
Butyl Acetate		1	1	2			2
Butyric Acid 5%	70°-150°	1	1	3	2	2	2
Aqueous Soln. Sp. G. .964	Boiling	1	1	3	3	3	2
Calcium Carbonate	70°	1	1	1			1
Calcium Chlorate							
Dilute Solution	70° or						
	Hot	1	1	2			2
Calcium Chloride							
Dilute or Concen. Solution	70°	2**	1**	3	2	2	3
Calcium Chlorohypochlorite							
(Bleaching Powder) 1%	70°	3	3	3	2	2	3
(Bleaching Powder) 5%	70°	3	3	3	2	2	3
Calcium Hypochlorite, 2%	70°	2**	1**	3	2	2	3
Calcium Hydroxide, 10-20%	Boiling	1	1	3	1	1	1
Calcium Sulphate, Saturated	70°	1	1	3	1	1	2
Carbonic Acid Saturated Soln.	70°	1	1	3	3	1	3
Carbolic Acid C.P.	70° or						
	Boiling	1	1	3	2	2	1
Carbonated Water		1	1	3	2	2	3
Carbon Bisulfide	70°	1	1	2	1	2	2
Carbon Monoxide Gas	1400°						
	1600°	1	1	1	3	3	1
Carbon Tetrachloride							
C.P.	70°	1	1	2	1	1	1
Dry C.P.	Boiling	1	1	2	1	1	2
Commercial + 1% Water		3**	3	3	2	2	2
Carnallite - Cold Saturated Soln.							
($KCl \cdot MgCl_2 \cdot 6H_2O$)	Boiling	3	1**				
Cellulose		1	1				1
Chloracetic Acid	70°	3	3	3	2	2	2
Chlorbenzol Conc. Pure Dry	70°	1	1	2	2	2	2
Chloric Acid	70°	3	3	3	3	3	3
Chlorine Gas (Dry)	70°	3	2	2	1	1	2
Chlorine Gas (Moist)	70°	3	3	3	3	3	3
Chlorinated Water, Saturated		3**	2**	3			2
Chloroform	70°	1	1	1	1	1	1
Chromic Acid							
5% C.P.	70°	1	1	3	3	3	3
10%	70°	3	2	3	3	3	3
Chromic Acid							
10% C.P.	Boiling	3	2	3	3	3	3
50% C.P.	70°	3	2	3	3	3	3
50% C.P.	Boiling	3	3	3	3	3	3
Commercial 50% (Cont. SO_3)	70°	3	3	3	3	3	3
Commercial 50% (Cont. SO_3)	Boiling	3	3	3	3	3	3
Chromium Plating Bath	70°	1	1	2			3
Cidar	70°	1	1	3	1	1	1
Citric Acid, 5% Still	70°-150°	1	1	3	2	1	2
15% Still	70°	1	1	3	3	2	2
15% or Concentrated	Boiling	2	1	3	3	2	3
Coca-Cola Syrup® (Pure)	70°	1	1	3			2
Coffee	Boiling	1	1	3	1	1	1
Cooper Acetate (Sat. Sol.)	70°	1	1	3			2
Copper Carbonate (Sat. Sol.)							
in 50% NH_4OH		1	1		3	3	-
Copper Chloride, 1% Agitated	70°	2**	1**	3	3	3	3
1% Agitated	158°	3	3	3	3	3	3
1% Aerated	70°	2**	1**	3	3	3	3
5% Agitated	70°	3**	2**	3	3	3	3
5% Aerated	70°	3**	3**	3	3	3	3
Copper Cyanide (Sat. Sol.)	Boiling	1	1		3	3	2
Cooper Nitrate							
1% Still, Agitated & Aerated	70°	1	1	3	3	3	3
5% Still, Agitated & Aerated	70°	1	1	3	3	3	3
50% Aqueus Solution	Hot	1	1	3	3	3	3
Copper Sulphate							
5% Agitated Still or Aerated	70°	1	1	3	2	2	3
Saturated Solution	Boiling	1	1	3	2	2	3
Creosote (Coal Tar)	Hot	1	1	2	1	1	2
Creosote Oil	Hot	1	1	2	2	2	2
Cyanogen Gas	70°	1	1				-
Dichloroethane (Dry)	Boiling	1	1	3	3	3	2
Dinitrochlorobenzene							
Melted & Solidified	70°	1	1	3			-
Distillery Wort	70°	1	1				-
Developing Solutions	70°	1	1				-
Dyewood Liquer	70°	1***	1	3			2
Epsom Salt (Magnesium Sulfate)	Hot &						
	Cold	1	1	3	1	1	2
Ethers	70°	1	1	2	1	1	2
Ethyl Acetate (Conc. Sol.)	70°	1	1	2	1	1	2
Ethyl Chloride	70°	1	1	2	2	2	1
Ethylene Chloride	70°	1	1	2	2	2	1
Ethylene Glycol	70°	1	1	2	1	1	1
Ferric Chloride							
1% Solution Still	70°	2**	1**	3	3	3	3
1% Solution	Boiling	3	3	3	3	3	3
5% Solution, Agitated, Aerated	70°	3	3	3	3	3	3
Ferric Hydroxide							
(Hydrated Iron Oxide)	70°	1	1	3			2
Ferric Nitrate							
1%-5% Quiescent or Agitated	70°	1	1	3	3	3	3
1%-5% Aerated	70°	1	1	3	3	3	3
Ferric Sulphate							
1%-5% Quiescent or Agitated	70°	1**	1	3	3	3	3
1%-5% Aerated	70°	1**	1	3	3	3	3
10%	Boiling	1**	1	3	3	3	3
Ferrous Chloride							
Saturated Solution	70°	3	1	3	2	2	-
Ferrous Sulphate							
Dilute Solution	70°	1	1	3	2	2	3
Fluorine (Gas) Moist	70°	3	3	3	3	3	3
Formaldehyde 40% Solution		1**	1**	2	1	1	1
Formic Acid, 5% Still	70°	2	1	3	2	2	2
5% Still	150°	2	1	3	2	2	3
Fruit Juices	70°	1	1	3	2	2	2
Fuel Oil	Hot	1	1	2	1	1	2
Containing Sulphuric Acid		3	2		3	3	2
Furfural	70°	1	1	2	1	1	2
Gallic Acid, 5%	70°-150°	1	1	3			2
Saturated	212°	1	1	3			2
Gasoline	70°	1	1	2	1	1	1
Gelatin		1	1	3	1	1	1
Glue Dry	70°	1	1	1	2	2	2
Solution – Acid	70°-140°	2**	1	2	3	3	2
Glycerine	70°	1	1	2	1	1	1
Hydrochloric Acid							
All Concentrations	70°	3	3	3	3	3	3
Hydrocyanic Acid	70°	1	1	3	3	3	2
Hydrofluoric Acid	70°	3	3	3	3	3	1

These charts contain recommendations based on published corrosion data for valid laboratory or field tests. However, this data should be used only as a guide and is not a guarantee of actual service performance. It is recommended that the user test the combination before connecting the product to any application. For additional recommendations contact US Hose.

Chemical	Temp. °F	Stainless Steel 18-8	Stainless Steel 18-8 Mo.	Mild Steel	Brass (80-20)	Bronze (Phos.)	Monel
Hydrofluosilicic Acid	70°	3	3	3	2	2	2
Hydrogen Peroxide	70°	1***	1	3	3	3	2
	Boiling	2***	1	3	3	3	2
Hydrogen Sulphide (Dry)	70°	1	1	2	1	1	3
Hydrogen Sulphide (Wet)	70°	2***	1***	3	3	3	3
Hyposulphite Soda (Hypo)		1	1				-
Ink	70°	2***	1	3	3	3	1
Iodine	70°	3	3	3	3	3	3
Iodoform	70°	1	1	3			2
Kerosene	70°	1	1	2	1	1	2
Ketchup, Quiescent	70°-150°	1**	1	3			2
Lactic Acid, 1%	70°	1	1	3	2	2	2
1%	Boiling	1	1	3	3	3	2
5%	70°	1	1	3	2	2	2
5%	150°						
	Boiling	2	1	3	3	3	2
10%	70°	2	1	3	3	3	2
10%	150°						
	Boiling	3	2	3	3	3	2
Concentrated	70°	2	1	3	2	2	2
Concentrated	Boiling	3	2	3	3	3	2
Lard	70°	1	1				1
Lead (Molten)	750°	2	2		3	3	3
Lead Acetate 5%	Boiling	1	1	3			2
Linseed Oil	70°	1	1	2	2	2	1
Plus 3% H_2SO_4	390°	2	1	3	3	3	1
Magnesium Chloride							
1% Quiescent	70°	1**	1	3	2	2	1
1% Quiescent	Hot	3	2**	3	2	2	1
5% Quiescent	70°	1**	1	3	2	2	1
5% Quiescent	Hot	3	2**	3	2	2	1
Magnesium Oxychloride	70°	3	2**	3			-
Magnesium Sulphate	Hot & Cold	1	1	3	1	1	1
Malic Acid	Hot & Cold	2	1	3			2
Mash	Hot	1	1				2
Mayonnaise	70°	1**	1	3			2
Mercury		1	1	1	3	3	3
Mercuric Chloride Dilute Sol.	70°	3	3	3	3	3	3
Methanol (Methyl Alcohol)		1	1	2	1	1	1
Milk, Fresh or Sour	70°	1	1	3	1	1	2
	Boiling	1	1	3	1	1	2
Mixed Acids							
53% H_2SO_4 + 45% HNO_3	Cold	1	1	3	3	3	3
Molasses		1	1	2	2	1	1
Muriatic Acid	70°	3	3	3	3	3	2
Mustard	70°	1**	1**	3			2
Naphtha, Crude	70°	1	1	2	2	2	1
Naphtha, Pure	70°	1	1	2	2	2	1
Naphthalene Sulfonic Acid	70°	1	1	3			1
Nickel Chloride Solution	70°	1**	1**	3	3	2	2
Nitrating Solution	Cold & Hot	2	2		3	2	3
Nickel Sulphate	Cold & Hot	1	1	3	3	1	1
Niter Cake	Fused	2	1	3			2
Nitric Acid							
5% - 50% - 70%	Boiling	1	1	3	3	3	3
65%	70°	1	1	3	3	3	3
65%	Boiling	2	2	3	3	3	3
Concentrated	70°	1	1	3	3	3	3
Concentrated	Boiling	3	3	3	3	3	3
Fuming Concentrated	70°-110°	1	1	3	3	3	3
Fuming Concentrated	Boiling	3	3	3	3	3	3
Nitrous Acid 5%	70°	1	1	3	3	3	3
Oils, Crude	Cold & Hot	1***	1***		2	2	1
Oils, Vegetable, Mineral	Cold & Hot	1***	1		2	2	1
Oleic Acid	70°-400°	1**	1	2	2	2	2
Oxalic Acid							
5%-10%	70° & Boiling	1	1	3	3	2	2
10%	Boiling	3	3	3	3	2	2
25%-50%	Boiling	3	3	3	3	2	1

Chemical	Temp. °F	Stainless Steel 18-8	Stainless Steel 18-8 Mo.	Mild Steel	Brass (80-20)	Bronze (Phos.)	Monel
Paraffine	Cold & Hot	1	1	2	1	1	1
Phenol (See Carbolic Acid)							
Petroleum Ether		1	1	2			2
Phosphoric Acid							
1%	70°	1*	1*	3	3	3	2
1%	Boiling	1	1	3	3	3	2
1%–45 lbs. Pressure	284°	1	1	3	3	3	2
5% Quiescent, or Agitated	70°	1	1	3	3	3	2
5% Aerated	70°	1	1	3	3	3	2
10% Quiescent	70°	3	1	3	3	3	2
10% Agitated or Aerated	70°	3	2	3	3	3	2
10%-50%	Boiling	1	1	3	3	3	3
80%	70°	3	3	3	3	3	2
80%	230°	3	3	3	3	3	3
85%	Boiling	3	3	3	3	3	3
Picric Acid	70°	1	1	3	3	3	3
Potassium Bichromate, 25%	70°	1	1		3	3	2
25%	Boiling	1	1		3	3	2
Potassium Bromide	70°	2**	1**	3	2	2	2
Potassium Carbonate 1%	70°	1	1	2	2	2	1
Potassium Carbonate	Hot	1	1	2	3	3	1
Potassium Chlorate							
Sat. at 212°	Boiling	1	1	2	3	3	3
Potassium Chloride							
1% Quiescent	70°	1**	1**	3	3	2	1
1% Agitated or Aerated	70°	1	1	3	3	2	1
5% Quiescent	70°	1	1	3	3	2	1
5% Agitated or Aerated	70°	1	1	3	3	2	1
5%	Boiling	1	1	3	3	2	1
Potassium Chromium Sulfate							
5%	70°	1**	1	3	3	2	-
Sp. G. 1.6	Boiling	3	3	3	3	3	-
Potassium Cyanide	70°	1	1	2	3	3	2
Potassium Ferricyanide, 5%-25%	70°	1	1	3			2
25%	Boiling	1	1	3			2
Potassium Ferricyanide, 5%	70°	1	1	3			2
Potassium Hydroxide, 5%	70°	1	1	2†	3	2	1
27%	Boiling	1	1	2†	3	2	1
50%	Boiling	2	1	3	3	2	1
Potassium Hypochlorite	70°	2	2	3	3	3	3
Potassium Nitrate							
1%-5% Still or Agitated	70°	1	1	3	2	2	1
1%-5% Aerated	70°	1	1	3	2	2	1
50%	70°	1	1	3	2	2	1
50%	Boiling	1	1	3			1
Molten	1022°	1	1	3			-
Potassium Oxalate		1	1				-
Potassium Permanganate, 5%	70°	1	1	2			3
Potassium Sulphate							
1%-5% Still or Agitated	70°	1	1	2	2	1	2
1%-5% Aerated	70°	1	1	2	2	1	2
	Hot	1	1	3	2	1	2
Potassium Sulphide (Salt)		1	1	3			-
Pyrogallic Acid		1	1	2			-
Quinine Bisulphate (Dry)		2	1	3			-
Quinine Sulphate (Dry)		1	1	3	2	2	2
Rosin	Molten	1	1	3	1	1	1
Sea Water	70°	1**	1**	3	2	2	1
Sewage		1***	1***		1	1	1
Silver Bromide		2**	1**	3	3	3	-
Silver Chloride		3	3	3	3	3	3
Silver Nitrate		1	1	3	3	3	3
Soap	70°	1	1	2	1	1	1
Sodium Acetate (Moist)		1**	1	3			2
Sodium Bicarbonate							
All Concentrations	70°	1	1	3	2	2	1
5% Still	150°	1	1	3	2	2	1
Sodium Bisulphate, Solution	70°	1***	1***	3	3	2	2
Saturated Solution	70°	3	3	3	3	2	2
2 g. + 1 g. H_2SO_4 liter	68°	3	1***	3	3	2	2
Sodium Carbonate, 5%	70°-150°	1	1	2	2	2	1
5%-50%	Boiling	1	1	2	2	2	1
Molten	1650°	3	3	3	3	3	1
Sodium Chloride, 5% Still	70°-150°	1**	1	3	3	2	1
20% Aerated	70°	1**	1	3	3	2	1
Saturated	70°	1**	1	3	3	2	1
Saturated	Boiling	2**	1	3	3	2	1

† Mild steel severly stressed subject to caustic embrittlement

Chemical	Temp. °F	Stainless Steel 18-8	Stainless Steel 18-8 Mo.	Mild Steel	Brass (80-20)	Bronze (Phos.)	Monel
Sodium Cyanide	70°	1	1	2	3	3	-
Sodium Fluoride, 5% Solution	70°	2**	1**	3	1	1	1
Sodium Hyroxide	70°	1	1	2	3	2	1
Sodium Hypochlorite, 5% Still		2**	1**	3	3	2	3
Sodium Hyposulfite	70°	1***	1	3			1
Sodium Nitrate	Fused	1	1	2	1	1	2
Sodium, Perchlorate, 10%	70°	1	1				-
	Boiling	1	1				-
Sodium Phosphate	70°	1	1	2	2	2	2
Sodium Sulphate, 5% Still	70°	1	1	3	1	1	1
All Concentrations	70°	1	1	3	1	1	1
Sodium Sulphide, Saturated		2**	1	3	3	3	2
Sodium Sulphite, 5%	70°	1	1	3	3	2	2
10%	150°	1	1	3	3	2	2
Sodum Thiosulphate							
Saturated Solution	70°	1	1***	3	3	3	1
Acid Fixing Bath (Hypo)	70°	1	1	3	3	3	2
25% Solution	70° & Boiling	1	1***	3	3	3	2
Stannic Chloride Solution							
Sp. G. 1.21	70° & Boiling	3	3	3	3	3	3
Stannous Chloride, Saturated		3	1	3			3
Steam		1	1	3	2	1	1
Stearic Acid	70°	1	1	3	3	2	2
Starch, Aqueous Solution		1	1				2
Strontium Hyroxide		1	1				-
Strontium Nitrate Solution	Hot	1	1	3			2
Sulphur, Moist	70°	2**	1**	3	3	3	2
Molten	266°	1	1	3	3	3	1
Molten	833°	3	3	3	3	3	3
Sulphur Chloride (Dry)		3	3	3	1	1	2
Sulphur Dioxide Gas (Moist)	70°	2	1	3	2	2	3
Sulphur Dioxide Gas (Dry)	575°	1	1	3	1	1	2
Sulphuric Acid							
5%-10%	70°	3	2	3	3	2	3
5%-10%	Boiling	3	3	3	3	3	3
50%	70°	3	3	3	3	3	3
50%	Boiling	3	3	3	3	3	3
Concentrated	70°	1	1	3	3	2	3
Concentrated	Boiling	3	3	3	3	2	3
Concentrated	300°	3	3	3	3	2	3
Fuming	70°	3	2	3	3	2	3
Sulphurous Acid, Saturated	70°	3	2	3	3	2	3
Saturated – 60 lb. Pressure	250°	3	2	3	3	2	3
Saturated – 70-125 lb. Pressure	310°	3	2	3	3	2	3
150 lbs. Pressure	375°	3	2	3	3	2	3
Sulphurous Spray	70°	3	3	3	3	3	3
Tannic Acid	70°	1	1	3	2	1	3
	150°	1	1		2	1	3
Tanning Liquor	70°	1	1				1
Tar		1	1	2	1	1	2
Tartaric Acid, 10%	70°	1	1	3	2	1	2
10%-50%	Boiling	2	1	3	2	1	2
Tin	Molten	3	3	3	3	3	-
Trichloracetic Acid	70°	3	3	3	3	2	3
Trichlorethylene (Dry)	70°	1**	1	3	1	1	1
Trichlorethylene (Moist)						2	2	-
Varnish	70°	1	1	2	1	1	1
Vegetable Juices		1	1	2	3	2	2
Vinegar Fumes		2	1	3	3	2	3
Vinegar, Still, Agitated or Aerated	70°	1	1	3	3	2	3
Water		1	1	2	1	1	1
Whiskey		1	1	3	2	1	1
Wine – All Phases of Processing and Storing	75°	1	1	3	3	3	2
Yeast		1	1		3	3	1
Zinc	Molten	3	3	3	3	3	3
Zinc Chloride, 5% Still	70°	1**	1**	3	3	3	2
	Boiling	2**	2**	3	3	3	2
Zinc Cyanide, Moist	70°	1	1	3			-
Zinc Nitrate, Solution	Hot	1	1	3			-
Zinc Sulphate, 5%	70°	1	1	3	3	2	2
25%	Boiling	1	1	3	3	2	2
Saturated	70°	1	1	3	3	2	2

INSTALLATION RULES

Installation Hints
To obtain maximum service life from metal hose, two IMPORTANT installation rules must be kept in mind:

1) Do Not Torque

A hose is subject to torque by:

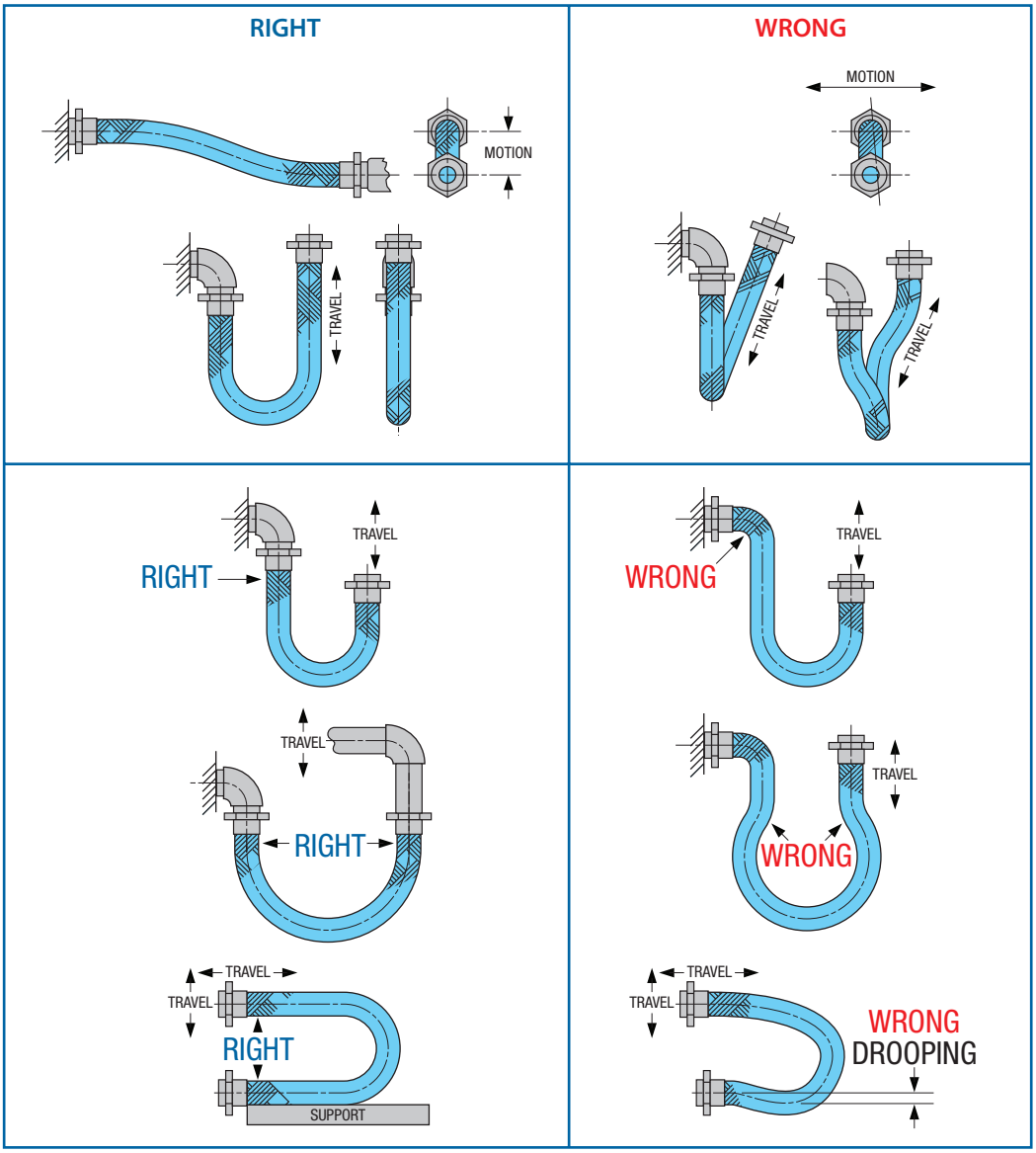
A) Twisting in installation. To minimize possible torque damage to a hose, a union or floating flange should be used at one end of the hose assembly. Where flanges are used, the fixed flange end should be bolted into place before place before the floating flange end. Where a threaded nipple and a union are used, the nipple end should be threaded into place, and then the union tightened into place using two wrenches.

B) Twisting on flexure. Always install the hose so that flexing takes place in one plane only, and in the plane of bending.

2) Avoid Sharp Bends

There are many ways a hose can be subjected to recurring sharp bends as a result of improper installation. A few examples are illustrated below. The minimum centerline bend radius for dynamic flexing should never be less than the values specified in the Technical Data Section.

Should piping restrictions make it impractical to install hose in the proper manner, the use of interlocked hose guard will limit the hose bending to a suitable radius, thus prolonging the life of the corrugated hose.



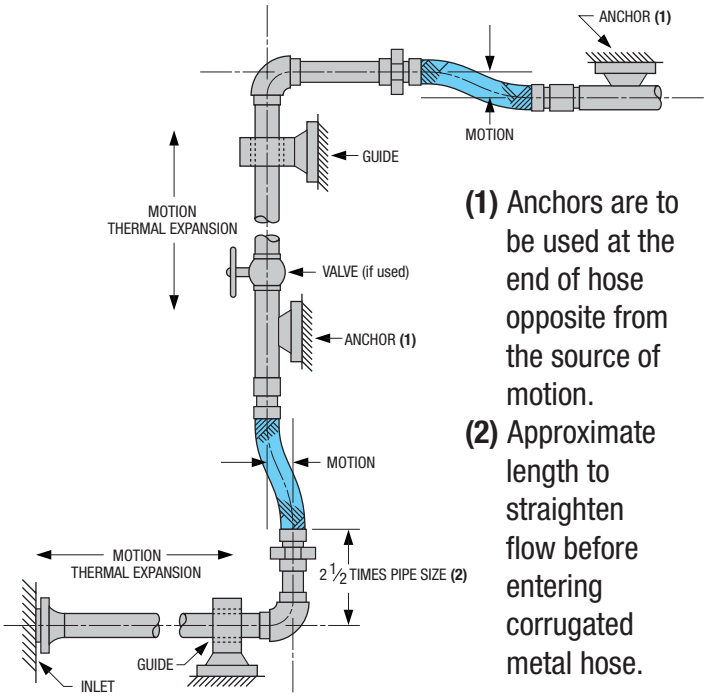
A piping system which utilizes flexible metal hose to absorb pipe movement must be properly anchored and guided to assure correct functioning and maximum service life of the metal hose. The basic principles to be observed are:

1) The direction of pipe motion must be perpendicular to the center line (axis) of the hose.

2) The pipe must be anchored at each change of direction where a flexible metal hose is employed to prevent torsional stress.

Typical examples of correct and incorrect guiding are shown below.

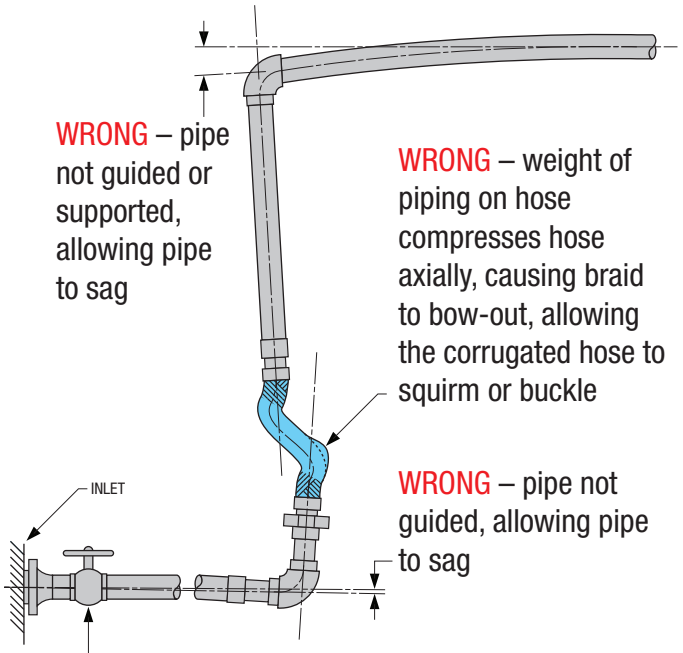
RIGHT



(1) Anchors are to be used at the end of hose opposite from the source of motion.

(2) Approximate length to straighten flow before entering corrugated metal hose.

WRONG



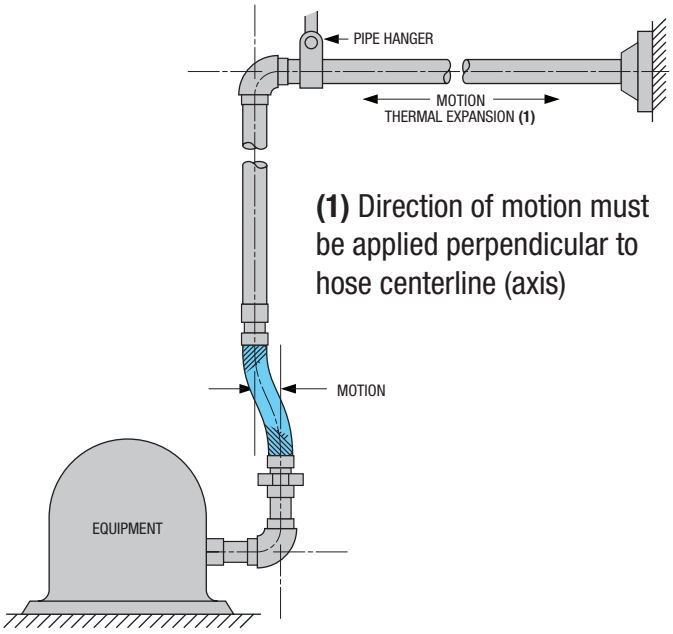
WRONG – pipe not guided or supported, allowing pipe to sag

WRONG – weight of piping on hose compresses hose axially, causing braid to bow-out, allowing the corrugated hose to squirm or buckle

WRONG – pipe not guided, allowing pipe to sag

WRONG – if valve between equipment and hose is quick-acting type

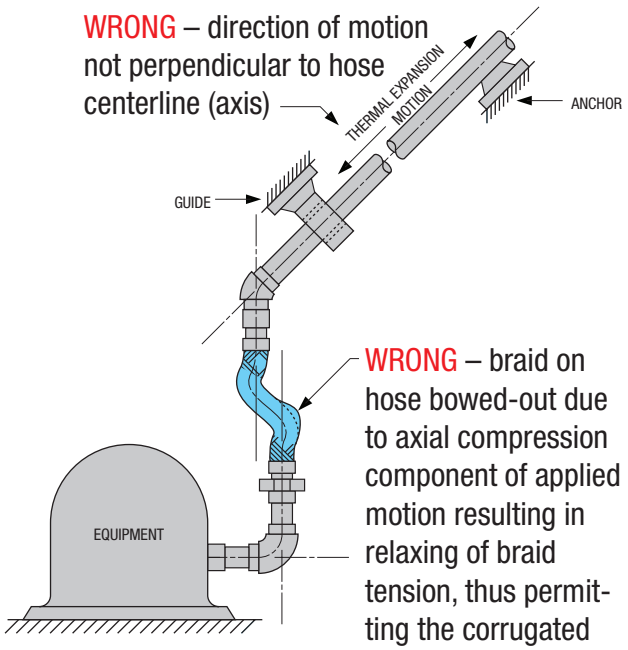
RIGHT



(1) Direction of motion must be applied perpendicular to hose centerline (axis)

WRONG

WRONG – direction of motion not perpendicular to hose centerline (axis)



WRONG – braid on hose bowed-out due to axial compression component of applied motion resulting in relaxing of braid tension, thus permitting the corrugated hose to buckle.

US HOSE TITEFLEX

THERMAL EXPANSION OF PIPE
IN INCHES PER 100 FEET

Examples:

A 3″ steel pipe line is 138 feet long. Maximum temperature the line will encounter is 440°F. Lowest temperature is 20°F.

Calculation:

From the chart – the expansion of steel pipe at:

440°F 3.595 inches per 100 feet of pipe

20°F 0.148 inches per 100 feet of pipe

Difference 3.447 inches per 100 feet of pipe

$\frac{138 \times 3.447}{100} = 4.75''$

or approximately $4^{3}/_{4}''$ total traverse.

A 4″ stainless steel line is 50 feet long. Maximum temperature the line will encounter is approximately 580°F. Lowest temperature is approximately – 180°F.

Calculation:
From the chart

– the expansion of stainless steel pipe at:

580°F 6.780 inches per 100 feet of pipe

– the contraction of stainless steel pipe at:

–180°F –1.850 inches per 100 feet of pipe

Total Movement 8.630 inches per 100 feet of pipe

$\frac{50 \times 8.630}{100} = 4.315''$

or approximately $4^{5}/_{16}''$ total traverse.

From the "Piping Handbook" by Sabin Crocker, McGraw-Hill Publishing Co.

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Units of Measure stated herein are inches, pounds, fahrenheit and pounds per square inch.

Saturated Steam Vacuum In Hg Below 212°F., Pressure psi Gauge Above 212°F.

VACUUM INCHES OF HG

29.39
28.89
27.99
26.48
24.04
20.27
14.63
6.45

PRESSURE PSI GAUGE

0
2.5
10.3
20.7
34.5
52.3
74.9
103.3
138.3
180.9
232.4
293.7
366.1
451.3
550.3
664.3
795.3
945.3
1115
1308
1525
1768
2041
2346
2705
3080

Temperature, Degrees Fahrenheit	Cast Iron	Carbon and Carbon Molybdenum Steel	Wrought Iron	4 – 6% Cr Alloy Steel	12% Cr Stainless Steel	18 Cr - 8 Ni Stainless Steel	Copper	Brass	Aluminum 6061 Alloy	Monel Alloy 400
-320					-1.770	-3.110	-2.975		-3.96	-2.60
-300					-1.670	-2.930	-2.805		-3.71	-2.44
-280					-1.570	-2.750	-2.635		-3.46	-2.28
-260					-1.470	-2.570	-2.465		-3.21	-2.12
-240					-1.370	-2.390	-2.295		-2.96	-1.96
-220	-1.058				-1.270	-2.210	-2.125		-2.71	-1.80
-200	0.982	-1.282	-1.289	-1.250	-1.170	-2.030	-1.955	-2.065	-2.46	-1.64
-180	-0.891	-1.176	-1.183	-1.150	-1.070	-1.850	-1.782	-1.890	-2.22	-1.48
-160	-0.797	-1.066	-1.073	-1.030	-0.970	-1.670	-1.612	-1.705	-1.97	-1.32
-140	0.697	-0.948	0.955	-0.970	-0.870	-1.480	-1.428	-1.508	-1.73	-1.15
-120	-0.593	-0.826	-0.833	-0.800	-0.750	-1.300	-1.235	-1.308	-1.47	-0.98
-100	-0.481	-0.698	-0.705	-0.700	-0.630	-0.900	-1.040	-1.098	-1.22	-0.82
-80	-0.368	-0.563	-0.570	-0.550	-0.520	-0.880	-0.835	-0.888	-0.98	-0.66
-60	-0.248	-0.428	-0.435	-0.430	-0.400	-0.670	-0.630	-0.673	-0.74	-0.49
-40	-0.127	-0.288	-0.295	-0.290	-0.270	-0.450	-0.421	-0.452	-0.49	-0.32
-20	0.0	-0.145	-0.152	-0.145	-0.130	-0.225	-0.210	-0.227	-0.25	-0.17
0	0.128	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.209	0.148	0.180	0.140	0.140	0.223	0.238	0.233	0.34	0.197
32	0.270	0.230	0.280	0.234	0.234	0.356	0.366	0.373	0.54	0.315
40	0.410	0.300	0.350	0.280	0.280	0.446	0.451	0.466	0.68	0.394
60	0.550	0.448	0.540	0.430	0.430	0.669	0.684	0.690	1.01	0.591
80	0.680	0.580	0.710	0.500	0.600	0.892	0.896	0.920	1.35	0.790
100	0.830	0.753	0.887	0.650	0.750	1.115	1.134	1.150	1.69	0.985
120	0.970	0.910	1.058	0.800	0.900	1.338	1.366	1.390	2.02	1.18
140	1.110	1.064	1.240	0.950	1.050	1.545	1.590	1.625	2.36	1.38
160	1.240	1.200	1.420	1.100	1.220	1.784	1.804	1.865	2.68	1.58
180	1.390	1.360	1.580	1.250	1.370	2.000	2.051	2.100	3.03	1.77
200	1.480	1.520	1.750	1.400	1.520	2.230	2.296	2.340	3.38	1.97
212	1.530	1.610	1.870	1.500	1.600	2.361	2.428	2.467	3.59	2.09
220	1.670	1.680	1.940	1.550	1.675	2.460	2.516	2.580	3.72	2.17
240	1.820	1.840	2.120	1.720	1.825	2.680	2.756	2.830	4.05	2.36
260	1.970	2.020	2.300	1.880	2.000	2.920	2.985	3.070	4.39	2.56
280	2.130	2.180	2.470	2.050	2.150	3.150	3.218	3.315	4.72	2.76
300	2.268	2.350	2.670	2.200	2.320	3.390	3.461	3.565	5.07	2.95
320	2.430	2.530	2.850	2.370	2.470	3.615	3.696	3.820	5.41	3.15
340	2.590	2.700	3.040	2.530	2.625	3.840	3.941	4.065	5.74	3.35
360	2.750	2.880	3.230	2.700	2.780	4.100	4.176	4.320	6.08	3.55
380	2.910	3.060	3.425	2.860	2.980	4.346	4.424	4.560	6.42	3.74
400	3.090	3.230	3.620	3.010	3.130	4.580	4.666	4.825	6.77	3.94
420	3.250	3.421	3.820	3.180	3.300	4.800	4.914	5.080	7.10	4.14
440	3.410	3.595	4.020	3.350	3.470	5.050	5.154	5.340	7.44	4.34
460	3.570	3.784	4.200	3.530	3.650	5.300	5.408	5.600	7.77	4.53
480	3.730	3.955	4.400	3.700	3.800	5.540	5.651	5.925	8.11	4.73
500	3.900	4.151	4.600	3.860	4.000	5.800	5.906	6.120	8.44	4.92
520	4.080	4.342	4.810	4.040	4.150	6.050	6.148	6.380	8.78	5.12
540	4.250	4.525	5.020	4.200	4.340	6.280	6.410	6.650	9.13	5.32
560	4.430	4.730	5.220	4.400	4.500	6.520	6.646	6.920	9.46	5.52
580	4.600	4.930	5.430	4.560	4.640	6.780	6.919	7.170	9.80	5.71
600	4.790	5.130	5.620	4.750	4.850	7.020	7.184	7.440	10.14	5.91
620	4.970	5.330	5.840	4.920	5.020	7.270	7.432	7.715	10.49	6.11
640	5.150	5.530	6.050	5.100	5.180	7.520	7.689	7.980	10.82	6.30
660	5.330	5.750	6.250	5.300	5.350	7.770	7.949	8.240		6.50
680	5.520	5.950	6.470	5.480	5.550	8.020	8.196	8.515		6.70
700	5.710	6.160	6.670	5.650	5.700	8.280	8.472	8.780		6.89
720	5.900	6.360	6.880	5.850	5.900	8.520	8.708	9.050		7.09
740	6.090	6.570	7.100	6.030	6.040	8.780	8.999	9.324		7.29
760	6.280	6.790	7.320	6.220	6.280	9.050	9.256	9.600		7.49
780	6.470	7.000	7.530	6.410	6.480	9.300	9.532	9.870		7.68
800	6.660	7.230	7.730	6.610	6.680	9.580	9.788	10.150		7.88
820	6.850	7.450	7.960	6.800	6.890	9.820	10.068	10.425		8.08
840	7.049	7.660	8.180	7.000	7.090	10.100	10.308	10.690		8.28
860	7.248	7.970	8.400	7.190	7.300	10.370	10.610	10.975		8.47
880	7.460	8.100	8.630	7.380	7.500	10.630	10.971	11.250		8.67
900	7.668	8.340	8.870	7.580	7.720	10.900	11.156	11.545		8.86
920	7.862	8.540	9.070	7.770	7.950	11.180	11.421	11.815		9.09
940	8.073	8.770	9.300	7.970	8.140	11.460	11.707	12.120		9.26
960	8.300	8.990	9.520	8.170	8.350	11.730	11.976	12.420		9.46
980	8.510	9.220	9.740	8.360	8.550	12.000	12.269	12.720		9.65
1000		9.420	9.970	8.550	8.750	12.260	12.543	13.080		9.85
1020		9.650		8.750	12.550					
1040		9.870		8.950	12.820					
1060		10.080		9.150	13.100					
1080		10.320		9.350	13.370					
1100		10.570		9.540	13.620					
1120		10.750		9.750	13.910					
1140		10.980		9.950	14.170					
1160		11.210		10.150	14.450					
1180		11.430		10.360	14.720					
1200		11.630		10.490	14.980					
1220		11.870		10.750	15.260					
1240		12.100		10.950	15.530					
1260		12.330		11.150	15.810					
1280		12.550		11.350	16.080					
1300		12.750		11.550	16.340					
1320		12.980		11.750	16.620					
1340		13.210		11.950	16.900					
1360		13.420		12.150	17.170					
1380		13.650		12.350	17.430					
1400		13.870		12.540	17.700					
1420					17.980					
1440					18.250					
1460					18.520					
1480					18.800					
1500					19.070					

Fractions and Decimal Equivalents

1/64	.015625	17/64	.265625	33/64	.51562	49/64	.765625
1/32	.03125	9/32	.28125	17/32	.53125	25/32	.78125
3/64	.046875	19/64	.296875	35/64	.54687	51/64	.796875
1/16	.0625	5/16	.3125	9/16	.5625	13/16	.8125
5/64	.078125	21/64	.328125	37/64	.578125	53/64	.828125
3/32	.09375	11/32	.34375	19/32	.59375	27/32	.84375
7/64	.109375	23/64	.359375	39/64	.609375	55/64	.859375
1/8	.125	3/8	.375	5/8	.625	7/8	.875
9/64	.140625	25/64	.390625	41/64	.640625	57/64	.890625
5/32	.15625	13/32	.40625	21/32	.65625	29/32	.90625
11/64	.171875	27/64	.421875	43/64	.671875	59/64	.921875
3/16	.1875	7/16	.4375	11/16	.6875	15/16	.9375
13/64	.203125	29/64	.453125	45/64	.703125	61/64	.953125
7/32	.21875	15/32	.46875	23/32	.71875	31/32	.96875
15/64	.234375	31/64	.484375	47/64	.734375	63/64	.984375
1/4	.250	1/2	.500	3/4	.750	1	1.0000

Metric Conversion Factors

Linear

1 Kilometer	=	.6214 Mile
1 Meter	=	39.37 Inches
	=	3.2808 Feet
	=	1.0936 Yards
1 Centimeter	=	.3937 Inches
1 Millimeter	=	.03937 Inches
1 Mile	=	1.609 Kilometer
1 Yard	=	.9144 Meter
1 Foot	=	30.48 Centimeter
	=	304.8 Millimeter
1 Inch	=	2.54 Centimeter
	=	25.4 Millimeter

Square

1 Sq. Kilometer	=	.3861 Sq. Mile
1 Sq. Meter	=	10.764 Sq. Ft.
	=	1.196 Sq. Yd.
1 Sq. Centimeter	=	.155 Sq. Inch
1 Sq. Millimeter	=	0.00155 Sq. Inch
1 Sq. Mile	=	2.5899 Sq. Kilometer
1 Sq. Yard	=	0.836 Sq. Meter
1 Sq.Foot	=	0.0929 Sq. Meter
	=	929 Sq. Centimeter
1 Sq. Inch	=	6.452 Sq. Centimeter
	=	645.2 Sq. Millimeter

Cubic Measure

1 Cu. meter	=	35.314 Cu. Ft.
	=	1.308 Cu. Yd.
	=	264.2 U.S. Gallons
1 Cu. Centimeter	=	.061 Cu. Inch
1 Liter	=	0.0353 Cu. Foot
	=	0.2642 U.S. Gallons
	=	1.0567 U.S. Quart
1 Cu. Yard	=	0.7645 Cu. Meter
1 Cu. Foot	=	0.02832 Cu. Meter
	=	28.317 Liters
1 Cu. Inch	=	16.38716 Cu. Meters
1 U.S. Gallon	=	3.785 Liters
1 U.S. Quart	=	0.946

Weight

1 Metric Ton	=	0.9842 Ton (2240 Lb.s)
	=	2204.6 Lb.s
1 Kilograms	=	2.2046 Lb.s
	=	.35.274 Oz.s Avoirdupois
1 Gram	=	0.03215 Oz.s Troy
	=	0.03527 Oz.s Avoirdupois
	=	15.432 Grains
1 Ton (2240 Lb.s)	=	1.016 Metric Ton
	=	1016 Kilogram
1 Pound	=	0.4536 Kilogram
	=	453.6 Grams
1 Oz.s Avoirdupois	=	28.35 Grams
1 Oz.s Troy	=	31.013 Grams
1 Grain	=	0.0648 Gram

Pressure

1 Kilogram Per. Sq. Millimeter	=	1422.32 Lb.s Per Sq. Inch
1 Kilogram Per. Sq. Centimeter	=	14.223 Lb.s Per Sq. Inch
1 Kilogram Meter	=	7.233 Foot Lb.s
1 Pound Per Sq. Inch	=	0.0703 Kilogram Per Sq. Centimeter

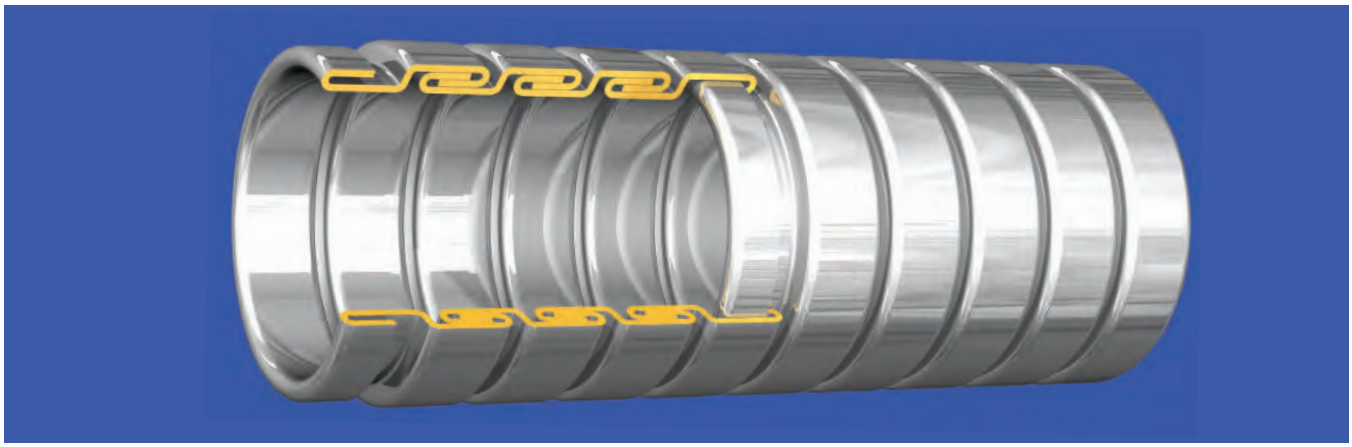
Temperature

$^{o}F = (1.8 \times {}^{o}C) + 32$

$^{o}C = ({}^{o}F - 32) \times 0.555$

Metric Abbreviations

Centimeter	=	CM
Kilogram	=	KG
Kilometer	=	KM
Liter	=	L
Meter	=	M
Millimeter	=	MM



RT-6

APPLICATIONS:

Auto heater tubing, Ventilating ducting, Automotive exhaust, Moderate suction lines, Dust collecting Ducting, Refrigeration tubing armor, Air Blower ducting, Wiring conduit, Carburetor air intake.

SIZE RANGE:

3/16" to 6" I.D. inclusive.
Larger sizes may be available - please contact the Factory for more information.

CONSTRUCTION:

Fully interlocked

METALS:

Stainless Steel, Galvanized Steel, Brass, Bronze, and Monel

METAL THICKNESS:

.010 inches - .012 inches

TEMPERATURE RATING

Galvanized Steel: Up to 200C/392F
T304 Stainless Steel: Up to 454C/850F

Nominal I.D. (Inches)	Nominal O.D. (Inches)	Minimum Inside Bend Diameter (Inches)	Weight Foot "100" Feet
3/16	0.281	3.000	11.000
1/4	0.375	3.000	11.000
3/8	0.500	4.000	14.000
1/2	0.625	6.000	16.000
5/8	0.750	6.500	18.000
3/4	0.875	6.500	20.000
7/8	1.000	7.000	24.000
1	1.130	7.500	28.000
1 1/8	1.260	8.500	32.000
1 1/4	1.380	9.500	36.000
1 3/8	1.510	10.000	38.000
1 1/2	1.650	11.000	48.000
1 5/8	1.780	12.000	52.000
1 3/4	1.900	13.000	58.000
1 7/8	2.030	14.000	60.000
2	2.160	15.000	66.000
2 1/8	2.280	15.500	72.000
2 1/4	2.410	16.500	76.000
2 3/8	2.530	17.500	81.000
2 1/2	2.660	18.500	85.000
2 3/4	2.910	20.000	93.000
2 7/8	3.030	21.000	97.000
3	3.160	22.000	102.000
3 1/4	3.410	24.000	110.000
3 1/2	3.660	26.000	118.000
3 3/4	3.910	27.000	127.000
4	4.160	29.000	135.000
4 1/2	4.660	33.000	152.000
5	5.170	37.000	168.000
6	6.170	44.000	200.000

Numbers based on strip thickness of .010" - .012"
Specifications for other sizes not shown and are available on application.

US HOSE FLEXIBLE METAL HOSE APPLICATIONS

DESIGN AND APPLICATIONS GUIDE

The selection of the correct metal hose is critical to insure optimum field performance. To accomplish this, there are a number of important applications requirements that must be known. The guide below will help you identify the requirements, and design the most cost effective, engineering sound product.

The word "STAMPED" is useful as a checklist of applications requirements to be considered.

Consider	Check for . . .	Refer to . . .
Size/Hose & Fittings	• Size of existing piping and mating fittings. • Flow requirements.	• "Hose Technical Data" pages
Temperature	• Maximum service temperature of the application. • Maximum allowable service temperature rating for hose and fitting alloys. • Reduced operating pressures at elevated temperature.	• "Metal Hose Selection Factors" pages for maximum service temperature for alloys and conversion factors
Alloy/Hose & Fittings	• Corrosion resistance of hose and fittings alloys for the media conveyed. • Maximum service temperature and pressure for the alloy selected.	• "Corrosion Chart" pages • "Metal Hose Selection Factors" pages for maximum service temperature for alloys and conversion factors
Motion & Application	• Type of motion—angular, axial, offset, radial, random, vibration, amount and frequency. • Hose type best suited for application and motion, including external durability requirements. • Cycle life requirement.	• "Corrosion Chart" pages • "Metal Hose Selection Factors" pages for motion applications
Pressure	• Burst, test and operating pressure. • Constant, pulsating or shock pressures. Operating pressure at elevated temperature. • Braid selection to maximize pressure/minimize cost.	• "Metal Hose Selection Factors" pages for pressure definitions • "Metal Hose Selection Factors" pages for maximum service temperature and conversion factors • "Hose Technical Data" pages
End Fitting Attachment	• Methods of attachment applicable to type and alloy of hose and fittings. • Maximum temperature for alloys and methods of attachment.	• "Metal Hose Selection Factors" pages for maximum service temperature of alloys page • "Corrugated Metal Hose Fitting" pages
Developed Assembly Length	• Minimum hose live length for type of motion. • Hose assembly length with fittings (overall length)	• "Metal Hose Selection Factors" pages for assembly life length, motion and vibration. • "Hose Technical Data" pages

NOTICE: This Engineering Guide No. 350 is to assist you in the selection and application of flexible metal hose for your particular requirements. The information and data contained in this Engineering Guide are the result of years of ***our*** experience and research in flexible metal hose. As such it is the best information and data available to us as of the date of printing. Progress is part of any dynamic program of research and development, such as the Company sponsors, so that all information and data contained herein are subject to change (without notice) at any time.

Should you be unable to determine a specification for a particular application, we solicit receiving details describing the application so that we may make a recommendation. Because we do not supervise or control the installation and use of our products, ***we cannot be responsible for their performance or for the improper application and usage of the data.***

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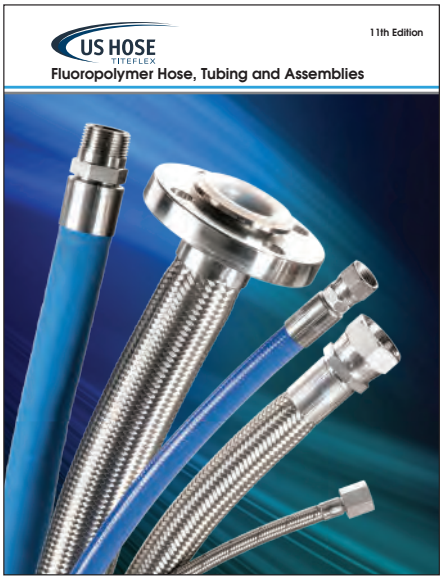

Metal

US HOSE
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MEMBER OF:
ILTA

NAHAD
Metal Hose
Listed Manufacturer

Specifications subject to change without notice.