Polyhose®

TOFLE

An Indo - Japan Joint Venture

METAL HOSE & ASSEMBLIES

INDEX

About us

Established in 2016 with the keen vision of establishing Polyhose India Pvt. Ltd. as a one-stop solution for all energy conveyance needs, Polyhose Tofle Pvt. Ltd. is a Joint Venture with the Japanese company Tofle Co. Ltd., which is the world's leading manufacturer of Stainless-Steel Hoses and Bellows with 50+ years' experience in manufacturing of metal hoses. The Factory houses state-of-the-art and latest machinery imported from Europe. Set up on a sprawling 20 Acre land. Our vision is to be the world's leading manufacturers and exporters of Metal Hoses and Assemblies. The factory manufactures Metal Hoses from ¼" to 12" in diameter.

CERTIFICATION

TÜVNORD

Certificate

TN/PED-3-1/4380/22

Report No. / Manufacturer No. / Validity remark: 8120597646/ 4380 / 13.07.2022 - 13.07.2025 / Rev. 1

Manufacturer of Pressure Equipment (SS Flexible Hoses) Directive 2014/68/EU, Annex I, Point 3.1

We hereby confirm that the manufacturer

POLYHOSE TOFLE PVT LTD.,
BLOCK C, SURVEY NO 251/2, 3 TO 12, POLYHOSE GREEN PARK,
KADAMBATHUR PANCHAYAT UNION.NAYAPAKKAM, TIRUVALLUR-602023,
TAMILNADU,INDIA

has been assessed and approved according to the requirements of Directive 2014/68/EU (Pressure Equipment Directive), annex I, point 3.1.

Place of manufacturing: **POLYHOSE TOFLE PVT LTD., TIRUVALLUR**

The manufacturer applies a quality assurance system to prepare, permanently join and test components for pressure equipment in such a way that the safety of the pressure equipment is not impaired and its traceability is guaranteed. The welding specifications were checked with test basis DIN EN ISO 3834 **part 2** related to the manufacture of pressure equipment. The details of the inspection can be found in the report.

Scope of approval: **Manufacturing of pressure equipment (AD 2000 HP 0)**

Auditor: R.GUNASEKAR

Essen, Date :21.07.2023

TÜVNORD Digital unterschrieben von Niekamp Dirk

Certification Body

TÜV NORD Systems GmbH & Co. KG
Große Bahnstraße 31, 22525 Hamburg, Germany
tuev-nord.de | dniekamp@tuev-nord.de

TÜVNORDGROUP

TÜVNORD

Certificate

TN/AD2000-HP0/4380/22

Report No. / Manufacturer No. / Validity remark: 8120597646 / 4380 / 13.07.2022 -13.07.2025 / Rev. 1

Manufacturer of SS Flexible Corrugated Hoses and Hose Assemblies With or Without Braid for Pressure Equipments

We hereby confirm that the manufacturer

POLYHOSE TOFLE PVT LTD.,
BLOCK C, SURVEY NO 251/2, 3 TO 12, POLYHOSE GREEN PARK,
KADAMBATHUR PANCHAYAT UNION.NAYAPAKKAM, TIRUVALLUR-602023,
TAMILNADU,INDIA

has been assessed and approved in accordance with

AD 2000 Merkblatt HP 0

Place of Manufacturing: **POLYHOSE TOFLE PVT LTD., TIRUVALLUR**

The manufacturer applies a product-related quality assurance system, has facilities to process the materials properly and to carry out the necessary tests. He has his own responsible supervisory personnel as well as competent personnel for the production.

The scope and details of the assessment can be found in the report.

Auditor: R.GUNASEKAR

Essen, Date 21.7.2023

TÜVNORD Digital unterschrieben von Niekamp Dirk

Certification Body

TÜV NORD Systems GmbH & Co. KG
Große Bahnstraße 31, 22525 Hamburg, Germany
tuev-nord.de | dniekamp@tuev-nord.de

TÜVNORDGROUP

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

CERTIFICATE

The Certification Body
of TÜV SÜD South Asia Private Limited
certifies that

POLYHOSE TOFLE PVT. LTD.
BLOCK C Survey No 251/2, 3 to 12,
POLYHOSE GREEN PARK, NAYAPAKKAM,
KADAMBATHUR PANCHAYAT UNION, Nayapakkam,
Thiruvallur, Thiruvallur - 602023, Tamilnadu, India

has implemented Quality Management System
in accordance with **ISO 9001:2015**
for the scope of

Manufacture of SS Flexible Hose, SS Braids and Metal Hose Assemblies.

The certificate is valid from **2021-08-13** until **2024-08-12**
Subject to successful completion of annual periodic audits
The present status of this certificate can be obtained through TUV SUD website by scanning below QR code and by entering the certificate number (without spaces) on web page. Further clarifications regarding the status & scope of this certificate may be obtained by consulting the certification body at info.in@tuvsud.com

Certificate Registration No. **99 100 18838**
Date of Initial certification: **2018-08-13**
Issue Date: **2023-07-04** Rev. **01**

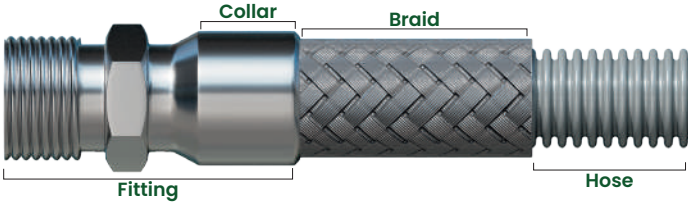
Rahul Kale
Head of Certification Body
of TÜV SÜD South Asia Private Limited,
Mumbai
Member of TÜV SÜD Group

TÜV SÜD South Asia Pvt. Ltd. ● TÜV SÜD House ● Saki Naka ● Andheri (East) ● Mumbai – 400072 ● Maharashtra ● India

1.1 METAL CORRUGATED HOSE

Corrugated metal hose allows for the transfer of liquids or gases, usually at high pressure and high or cryogenic temperature, while remaining flexible.

Where rigid connections are impractical, flexible metal hose provides non-rigid connections for conveying liquids, gases and semi-solids. Metal hose offers a number of advantages, including high strength, resistance to high or low temperature extremes and corrosion resistance. It absorbs vibrations and noise, connects misaligned rigid piping, connects moving parts of machinery or equipment, and is practical for hooking up frequently moved or dismantled equipment. Corrugated metal hose is manufactured in two basic forming styles: Mechanical & Hydro.



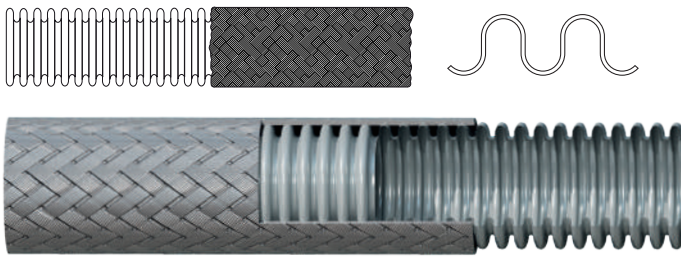
Types: Corrugated Hose & Stripwound Hose

Corrugated Hose:

Profile Type: Annular

Annular:
Hose is formed from tubing into individual parallel corrugations.

Annularly Corrugated Hose:



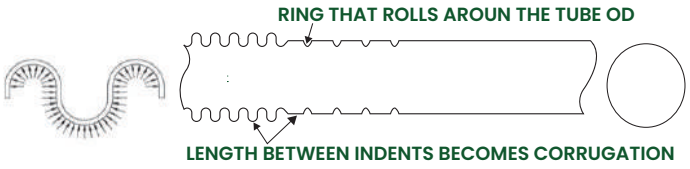
Types of Forming:
1. Mechanical Forming
2. Hydro Forming

Mechanical Forming

Size: 1/4" to 4"

Material: SS 304, SS 316L, SS 321, Inconel 625, Inconel 825, Inconel 800, Hastelloy, Monel &other special alloys on request.

A Longitudinal Weld Tube is fed into the corrugator, a ring rolls around it, creating slight indentations at regular intervals. The ring has a smooth radius to minimize stress concentrations. The intervals will become valleys between the corrugations.

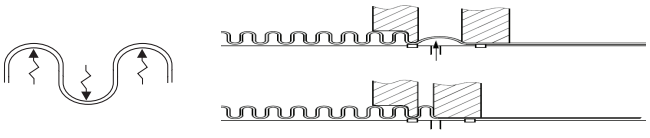


Hydro Forming

Size: 1.1/4" to 12"

Material: SS 304, SS 316L, SS 321, Inconel 625, Inconel 825, Inconel 800, Hastelloy, Monel &other special alloys on request.

In hydro forming, the force used to push the metal outward to form the corrugation is generated by water. The water pressure from inside the tube pushes the metal into a die on the outside of the tube which gives the bump its shape. Hydro forming may be used to form the corrugations individually, or in a group of several humps all at once in a multi-station form.



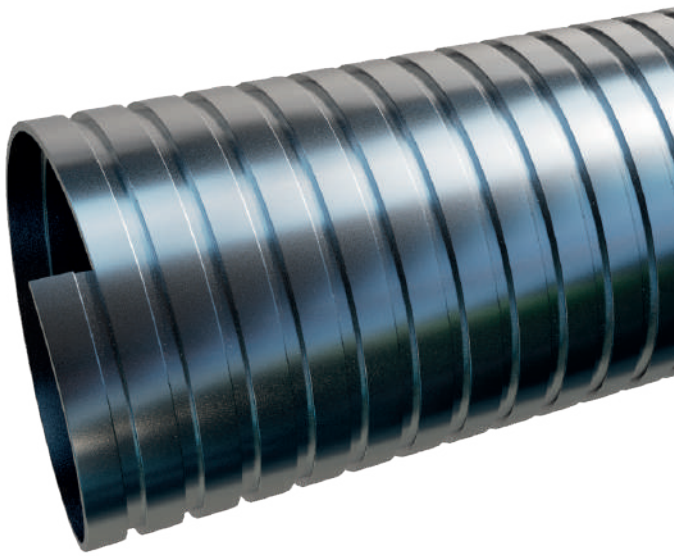
Braid:

Wire Dia: From 0.3 to 0.7 mm

Braiding Material: SS 304, SS 304L, SS 316L & SS 321

DESCRIPTION	RANGE
Size	1/4" -12"
Working Pressure	max-344 bar
Temperature	-200°C to 550°C
Wire Dia	0.3 to 0.7 mm
Sheet Thick	0.15 to 0.7 mm

1.2 STRIPWOUND HOSE:



Stripwound Metal Hose is a flexible metal hose that is ideal for the transfer of abrasive materials. Although it is not gas tight, like corrugated hose, it is durable and an excellent choice for use as a guard, an open-ended exhaust hose, and for the transfer of dry bulk materials.

It is also used in some water & wastewater treatment applications. One of the main benefits of stripwound hose is its ability to not contaminate the transferred product with any residue.

Material: SS 316L, SS 304 & GI

End Fitting: As per customer requirement.

Double Interlock

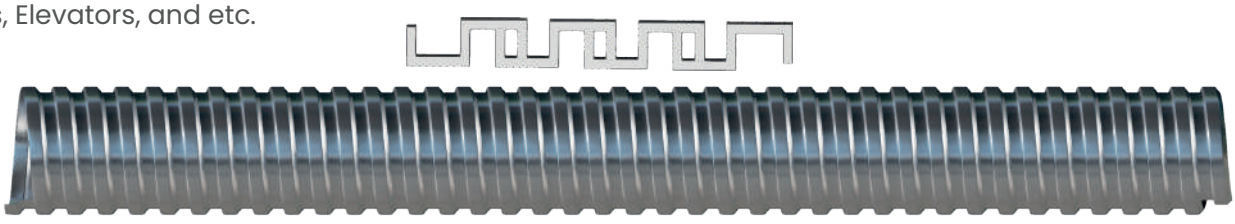
The double interlocked profile is designed to meet the highest demands that comply with tensile and bending strength, compression and impact resistence against all mechanical stresses.

Adjacent strips are completely folded & locked into each other. It had remarkable strength against axial elongation.

Squarelock

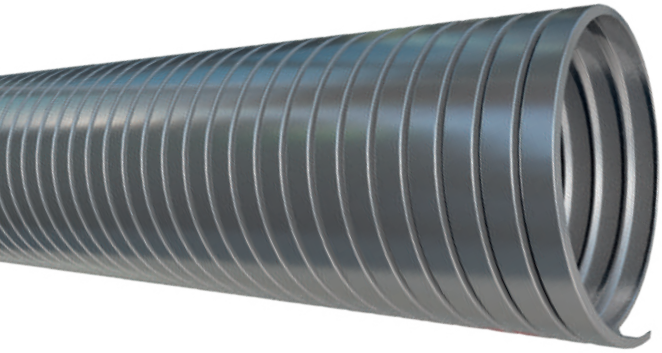
Squarelock manufactured with stainless steel strip by continuous wound in square-lock profile. Light in weight & typically used in application where limited to moderate strength is required.

Features & benefit: Extremely flexible. Applicable for electrical protection in Buildings, Railway System, Marines, Elevators, and etc.

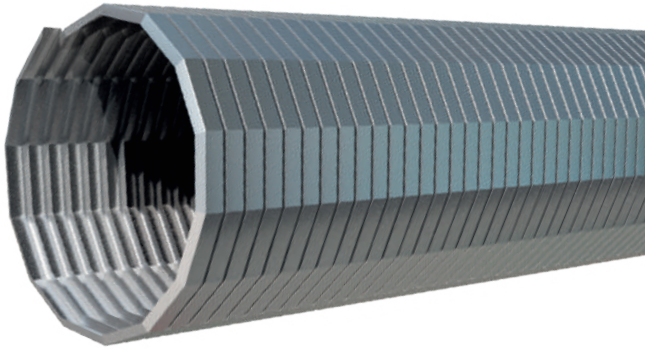


Types

CIRCULAR CROSS SECTION



POLYGONAL CROSS SECTION



1.3 PRODUCT NOMENCLATURE (Annular Hose)

R	006	MFM	X	R	1	0	T

Grade of Tube:
R - SS 304
G - SS 316L
B - SS 321
W - Loose Braid without tube

ID of Tube:
006- DN 6 ID 6.3mm
008-DN 8 ID 8.4mm and so on...

Manufacturing Series:
MFM- Mechanical Forming Medium Flexibility
MFMS- Mechanical Forming Medium Flexibility special
MFH- Mechanical Forming High Flexibility
HFH- Heavy duty Hose
HFM- Hydro forming medium Flexibility
HMH- Medium flexibility heavy weight hose
WMW- Medium weight braid
WHW- Heavy weight braid

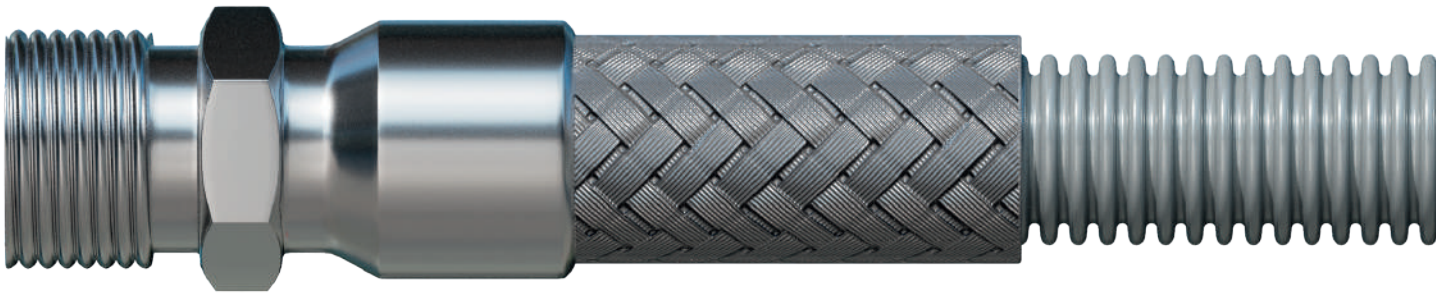
X-None

Grade of Braid:
R - SS 304L
G - SS 316L
B - SS 321
0 - None

Number of Braid:
0 - No Braids
1 - 1 Braid
2 - 2 Braids
3 - 3 Braids

Version:
0 - Standard
1 - Special Wire

T-length of Hose



1.4 PH 2000 SERIES - MFM

Structure : Annular Corrugated Mechanical formed flexible metal hoses produced from longitudinally welded tubes with or without braiding

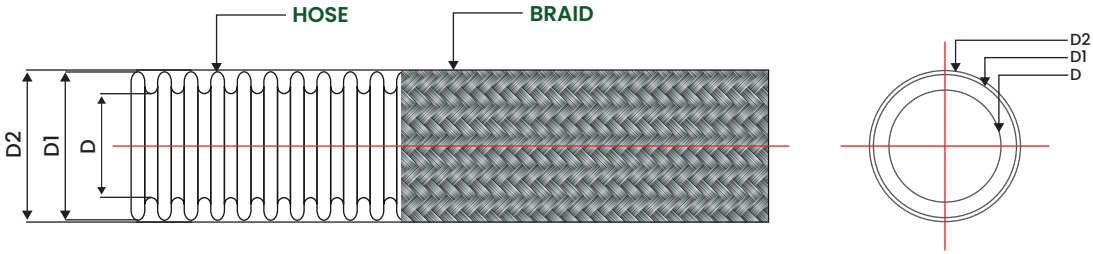
Characteristics : Standard Pitch / Medium Flexibility / Light Weight

Standards : EN ISO 10380

Hose material : Stainless Steel AISI 304, AISI 321, AISI 316L

Braiding material : Stainless Steel AISI 304, AISI 304L, AISI 316L & AISI 321

Suitable fittings types : Threaded end, Flange end, Pipe end, etc. as per customer specifications

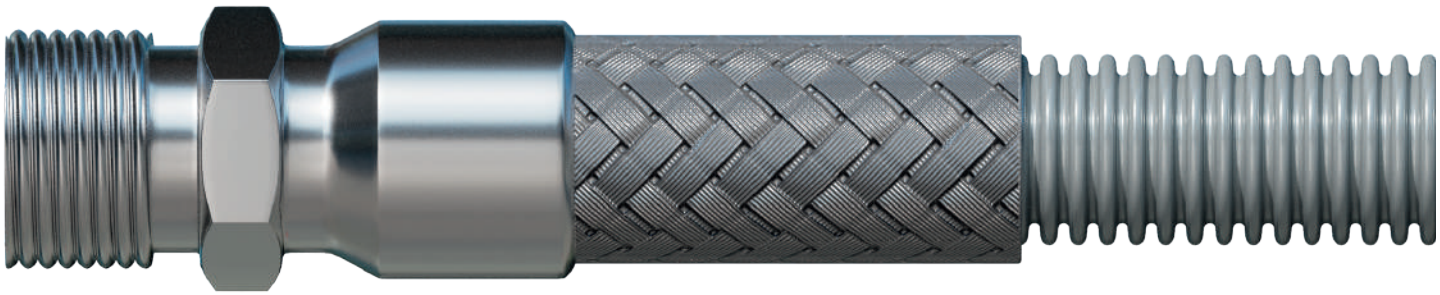


SIZE	ITEM CODE	BRAIDS	BRAID CONSTRUCTION (NO OF CARRIERS X NO OF STRANDS X WIRE DIAMETER)	BRAID	ID	OD	WP	BP	BR/r		W
				COVERAGE	(D)	(D1 & D2)	(Max) @20°C	(Min) @20°C	DYNAMIC	STATIC	WEIGHT
				%	mm	mm	bar	bar	mm	mm	kg/m
1/4"	R006MFMX000T	0	24 X 5 X 0.3	94	6.30	9.60	5	--	--	--	0.07
	R006MFMXR10T	1			6.30	10.80	162	648	110.00	25.00	0.16
	R006MFMXR20T	2			6.30	12.00	243	972	--	--	0.24
5/16"	R008MFMX000T	0	24 X 5 X 0.3	92	8.50	12.10	5	--	--	--	0.09
	R008MFMXR10T	1			8.50	13.60	112	448	130.00	32.00	0.18
	R008MFMXR20T	2			8.50	14.80	168	672	--	--	0.27
3/8"	R010MFMX000T	0	24 X 6 X 0.3	92	10.00	14.10	5	--	--	--	0.10
	R010MFMXR10T	1			10.00	15.70	97	388	150.00	38.00	0.22
	R010MFMXR20T	2			10.00	16.90	145.5	582	--	--	0.34
1/2"	R012MFMX000T	0	24 X 8 X 0.3	92	12.10	16.70	4.5	--	--	--	0.11
	R012MFMXR10T	1			12.10	18.20	89	356	165.00	45.00	0.28
	R012MFMXR20T	2			12.10	19.40	133	533	--	--	0.45

5/8"	R016MFMX000T	0	36 X 7 X 0.3	96	16.60	21.90	4.5	--	--	--	0.18
	R016MFMXR10T	1			16.60	23.50	60	240	195.00	58.00	0.38
	R016MFMXR20T	2			16.60	24.70	90	360	--	--	0.57
3/4"	R020MFMX000T	0	36 X 9 X 0.3	94	20.20	26.70	3	--	--	--	0.27
	R020MFMXR10T	1			20.20	28.20	60	240	225.00	70.00	0.53
	R020MFMXR20T	2			20.20	29.40	90	360	--	--	0.78
1"	R025MFMX000T	0	36 X 10 X 0.3	96	25.30	32.30	3	--	--	--	0.36
	R025MFMXR10T	1			25.30	33.80	50	200	260.00	85.00	0.66
	R025MFMXR20T	2			25.30	35.00	75	300	--	--	0.96
1 1/4"	R032MFMX000T	0	48 X 8 X 0.4	94	33.60	41.20	3	--	--	--	0.54
	R032MFMXR10T	1			33.60	43.00	46	184	300.00	105.00	1.04
	R032MFMXR20T	2			33.60	44.60	69	276	--	--	1.55
1 1/2"	R040MFMX000T	0	48 X 9 X 0.4	92	40.00	49.50	2	--	--	--	0.70
	R040MFMXR10T	1			40.00	51.30	42	168	340.00	130.00	1.28
	R040MFMXR20T	2			40.00	52.90	63	252	--	--	1.86
2"	R050MFMX000T	0	48 X 10 X 0.4	96	50.40	60.70	2	--	--	--	0.88
	R050MFMXR10T	1			50.40	62.60	32	128	390.00	160.00	1.51
	R050MFMXR20T	2			50.40	64.20	48	192	--	--	2.14

Note:

1. Test pressure is 1.5 times of working pressure @ 20°c.
2. WP - Working Pressure, BP - Burst Pressure.



1.5 PH 2100 SERIES - MFM SPECIAL

Structure : Annular Corrugated Mechanical formed flexible metal hoses produced from longitudinally welded tubes with or without braiding

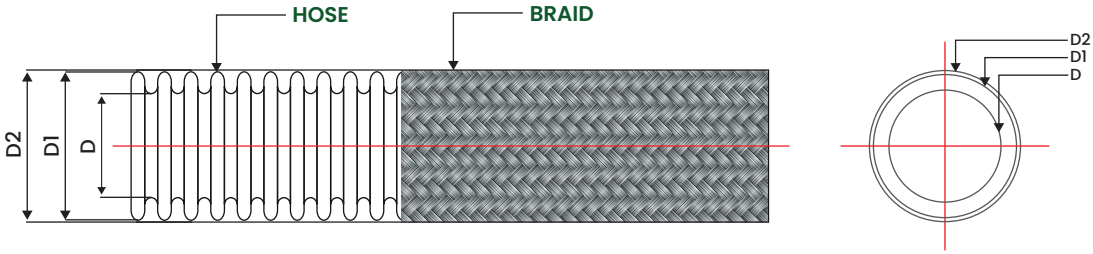
Characteristics : Standard Pitch-Special Braid / Medium Flexibility / Light Weight

Standards : EN ISO 10380

Hose material : Stainless Steel AISI 304, AISI 321, AISI 316L

Braiding material : Stainless Steel AISI 304, AISI 304L, AISI 316L & AISI 321

Suitable fittings types : Threaded end, Flange end, Pipe end, etc. as per customer specifications

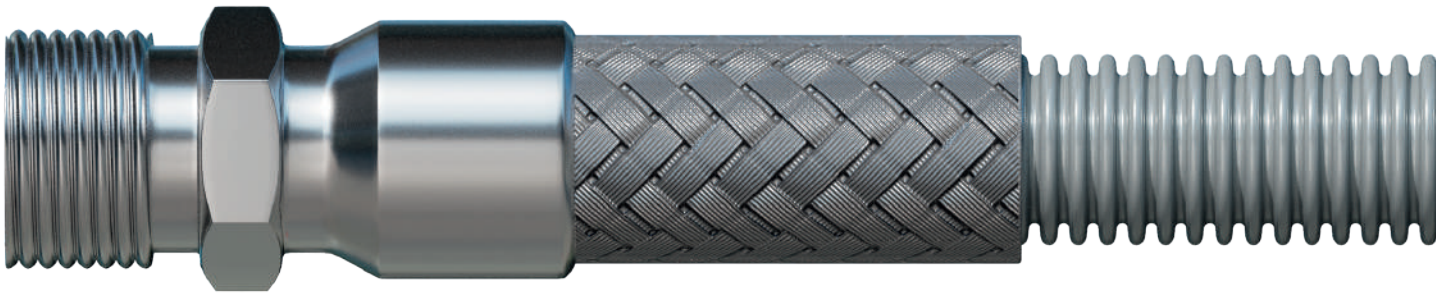


SIZE	ITEM CODE	BRAIDS	BRAID CONSTRUCTION (NO OF CARRIERS X NO OF STRANDS X WIRE DIAMETER)	BRAID	ID	OD	WP	BP	BR/r		W
				COVERAGE	(D)	(D1 & D2)	(Max) @20°C	(Min) @20°C	DYNAMIC	STATIC	WEIGHT
				%	mm	mm	bar	bar	mm	mm	kg/m
1/4"	R006MFMS000T	0	24 X 5 X 0.3	94	6.30	9.60	5	---	---	---	0.08
	R006MFMSR10T	1			6.30	10.80	162	648	110	25	0.16
	R006MFMSR20T	2			6.30	12.00	194.4	778	---	---	0.24
5/16"	R008MFMS000T	0	24 X 6 X 0.3	92	8.50	12.10	5	---	---	---	0.10
	R008MFMSR10T	1			8.50	13.60	114	456	130	32	0.20
	R008MFMSR20T	2			8.50	14.80	137	547	---	---	0.30
3/8"	R010MFMS000T	0	24 X 7 X 0.3	92	10.00	14.10	5	---	---	---	0.10
	R010MFMSR10T	1			10.00	15.70	110	440	150	38	0.24
	R010MFMSR20T	2			10.00	16.90	132	528	---	---	0.38
1/2"	R012MFMS000T	0	24 X 8 X 0.3	92	12.10	16.70	4.5	---	---	---	0.11
	R012MFMSR10T	1			12.10	18.20	89	356	165	45	0.28
	R012MFMSR20T	2			12.10	19.40	107	427	---	---	0.45

5/8"	R016MFMS000T	0	36 X 8 X 0.3	96	16.60	21.90	4.5	---	---	---	0.20
	R016MFMSR10T	1			16.60	23.50	80	320	195	58	0.41
	R016MFMSR20T	2			16.60	24.70	96	384	---	---	0.62
3/4"	R020MFMS000T	0	36 X 9 X 0.3	94	20.20	26.70	3	---	---	---	0.27
	R020MFMSR10T	1			20.20	28.20	70	280	225	70	0.53
	R020MFMSR20T	2			20.20	29.40	84	336	---	---	0.78
1"	R025MFMS000T	0	36 X 9 X 0.4	96	25.30	32.30	3	---	---	---	0.36
	R025MFMSR10T	1			25.30	34.20	58	232	260	85	0.76
	R025MFMSR20T	2			25.30	35.40	70	278	---	---	1.16
1 1/4"	R032MFMS000T	0	48 X 8 X 0.4	94	33.60	41.20	3	---	---	---	0.54
	R032MFMSR10T	1			33.60	43.00	46	184	300	105	1.04
	R032MFMSR20T	2			33.60	44.60	56	224	---	---	1.55
1 1/2"	R040MFMS000T	0	48 X 9 X 0.4	92	40.00	49.50	2	---	---	---	0.70
	R040MFMSR10T	1			40.00	51.30	42	168	340	130	1.28
	R040MFMSR20T	2			40.00	52.90	52	208	---	---	1.86
2"	R050MFMS000T	0	48 X 9 X 0.5	96	50.40	60.70	2	---	---	---	0.88
	R050MFMSR10T	1			50.40	63.00	38	152	390	160	1.78
	R050MFMSR20T	2			50.40	64.60	48	192	---	---	2.68

Note:

1. Test pressure is 1.5 times of working pressure @ 20°c.
2. WP - Working Pressure, BP - Burst Pressure.



1.6 PH 2200 SERIES-MFH

Structure : Annular Corrugated Mechanical formed flexible metal hoses produced from longitudinally welded tubes with or without braiding

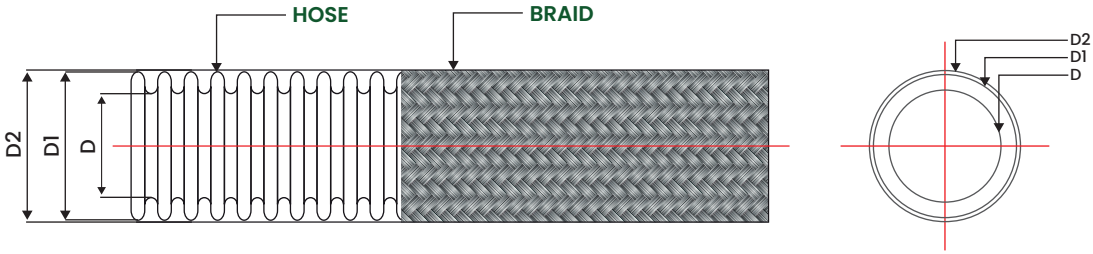
Characteristics : Close Pitch / High Flexibility / Medium Weight

Standards : EN ISO 10380

Hose material : Stainless Steel AISI 304, AISI 321, AISI 316L

Braiding material : Stainless Steel AISI 304, AISI 304L, AISI 316L & AISI 321

Suitable fittings types : Threaded end, Flange end Pipe, etc. as per customer specifications

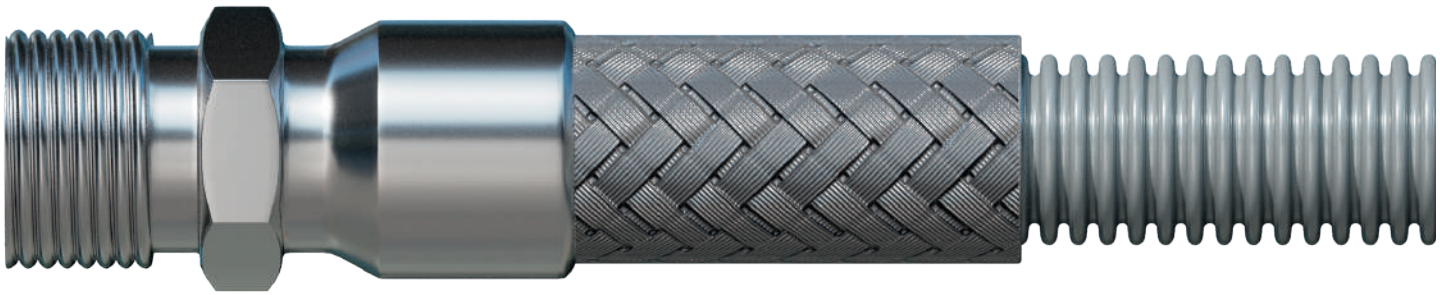


SIZE	ITEM CODE	BRAIDS	BRAID CONSTRUCTION (NO OF CARRIERS X NO OF STRANDS X WIRE DIAMETER)	BRAID COVERAGE	ID (D)	OD (D1 & D2)	WP (Max) @20°C	BP (Min) @20°C	BR/r DYNAMIC	BR/r STATIC	W WEIGHT
				%	mm	mm	bar	bar	mm	mm	kg/m
1/4"	R006MFHX000T	0	24 X 5 X 0.3	95	6.30	9.60	5	--	--	--	0.11
	R006MFHXR10T	1			6.30	10.80	163	648	77.00	25.00	0.19
	R006MFHXR20T	2			6.30	12.00	196	777	--	--	0.26
5/16"	R008MFHX000T	0	24 X 6 X 0.3	92	8.50	12.10	5	--	--	--	0.15
	R008MFHXR10T	1			8.50	13.60	114	455	91.00	32.00	0.25
	R008MFHXR20T	2			8.50	14.80	137	546	--	--	0.35
3/8"	R010MFHX000T	0	24 X 7 X 0.3	93	10.00	14.10	5	--	--	--	0.16
	R010MFHXR10T	1			10.00	15.70	110	441	105.00	38.00	0.29
	R010MFHXR20T	2			10.00	16.90	132	530	--	--	0.40
1/2"	R012MFHX000T	0	24 X 8 X 0.3	92	12.10	16.70	4	--	--	--	0.17
	R012MFHXR10T	1			12.10	18.20	89	356	116.00	45.00	0.31
	R012MFHXR20T	2			12.10	19.40	107	427	--	--	0.45

5/8"	R016MFHX000T	0	36 X 8 X 0.3	93	16.60	21.90	4	--	--	--	0.30
	R016MFHXR10T	1			16.60	23.50	80	320	136.00	58.00	0.51
	R016MFHXR20T	2			16.60	24.70	96	384	--	--	0.72
3/4"	R020MFHX000T	0	36 X 9 X 0.3	96	20.20	26.70	3	--	--	--	0.44
	R020MFHXR10T	1			20.20	28.20	70	280	158.00	70.00	0.69
	R020MFHXR20T	2			20.20	29.40	84	336	--	--	0.95
1"	R025MFHX000T	0	36 X 9 X 0.4	95	25.30	32.30	3	--	--	--	0.58
	R025MFHXR10T	1			25.30	34.20	58	232	182.00	85.00	0.99
	R025MFHXR20T	2			25.30	35.80	69	278	--	--	1.39
1 1/4"	R032MFHX000T	0	48 X 8 X 0.4	95	33.60	41.20	3	--	--	--	0.76
	R032MFHXR10T	1			33.60	43.00	46	183	210.00	105.00	1.25
	R032MFHXR20T	2			33.60	44.60	55	220	--	--	1.75
1 1/2"	R040MFHX000T	0	48 X 9 X 0.4	94	40.00	49.50	2	--	--	--	0.98
	R040MFHXR10T	1			40.00	51.30	42	167	238.00	130.00	1.56
	R040MFHXR20T	2			40.00	52.90	52	208	--	--	2.13
2"	R050MFHX000T	0	48 X 9 X 0.5	94	50.40	60.70	2	--	--	--	1.23
	R050MFHXR10T	1			50.40	63.00	38	152	273.00	160.00	2.13
	R050MFHXR20T	2			50.40	65.00	46	182	--	--	3.03
2 1/2"	R065MFHX000T	0	72 X 7 X 0.5	95	62.80	76.30	1	--	--	--	1.21
	R065MFHXR10T	1			62.80	78.90	30	120	460.00	200.00	2.35
	R065MFHXR20T	2			62.80	80.90	36	144	--	--	3.49
3"	R080MFHX000T	0	72 X 9 X 0.5	93	78.70	94.50	1	--	--	--	1.89
	R080MFHXR10T	1			78.70	97.10	25	100	660.00	240.00	3.19
	R080MFHXR20T	2			78.70	99.10	30	120	--	--	4.49
4"	R100MFHX000T	0	72 X 10 X 0.5	88	97.80	114.20	1	--	--	--	2.60
	R100MFHXR10T	1			97.80	116.70	19	76	750.00	290.00	4.00
	R100MFHXR20T	2			97.80	118.70	23	91	--	--	5.40

Note:

1. Test pressure is 1.5 times of working pressure @ 20°c.
2. WP - Working Pressure, BP - Burst Pressure.



1.7 PH 2300 SERIES - HFH

Structure : Annular Corrugated Mechanical / Hydroformed flexible metal hoses produced from longitudinally welded tubes with or without braiding

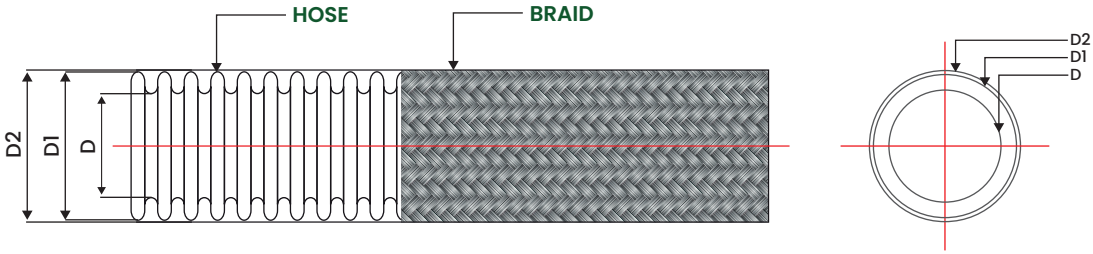
Characteristics : Standard Pitch / Standard Flexibility / Heavy Wall Thickness

Standards : EN ISO 10380

Hose material : Stainless Steel AISI 304, AISI 321, AISI 316L

Braiding material : Stainless Steel AISI 304, AISI 304L, AISI 316L & AISI 321

Suitable fittings types : Threaded end, Flange end, Pipe end, etc. as per customer specifications

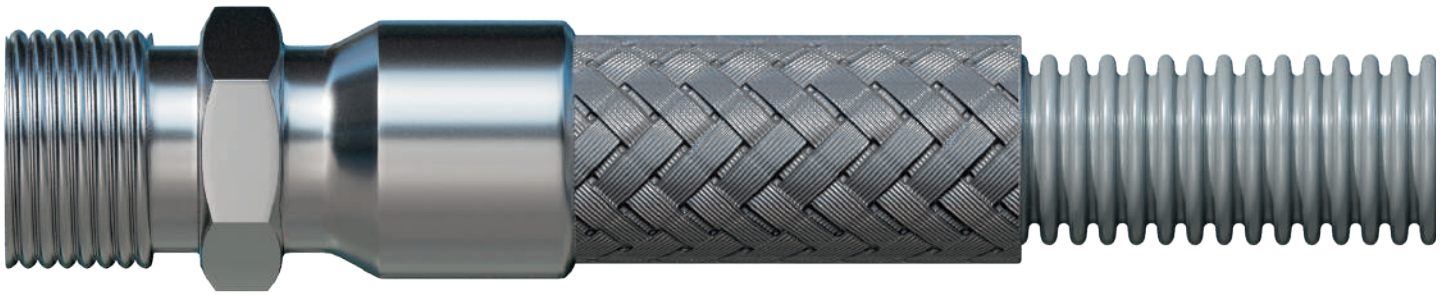


SIZE	ITEM CODE	BRAIDS	BRAID CONSTRUCTION (NO OF CARRIERS X NO OF STRANDS X WIRE DIAMETER)	BRAID	ID	OD	WP	BP	BR/r		W
				COVERAGE	(D)	(D1 & D2)	(Max) @20°C	(Min) @20°C	DYNAMIC	STATIC	WEIGHT
				%	mm	mm	bar	bar	mm	mm	kg/m
1/4"	R006HFHX000T	0	24 X 5 X 0.35	98	6.00	10.10	13.8	--	--	--	0.12
	R006HFHXR10T	1			6.00	12.20	172	688	125.00	26.00	0.26
	R006HFHXR20T	2			6.00	13.60	258	1032			0.39
5/16"	R008HFHX000T	0	24 X 6 X 0.35	98	7.60	12.20	12.4	--	--	--	0.17
	R008HFHXR10T	1			7.60	14.50	160	640	125.00	26.00	0.31
	R008HFHXR20T	2			7.60	15.90	240	960			0.44
3/8"	R010HFHX000T	0	24 X 8 X 0.35	98	11.00	16.20	6.9	--	--	--	0.18
	R010HFHXR10T	1			11.00	18.00	120	480	140.00	32.00	0.39
	R010HFHXR20T	2			11.00	19.40	180	720			0.60
1/2"	R012HFHX000T	0	24 X 9 X 0.35	94	14.50	21.10	5.5	--	--	--	0.32
	R012HFHXR10T	1			14.50	22.90	85	340	155.00	40.00	0.55
	R012HFHXR20T	2			14.50	24.30	127.5	510			0.78

3/4"	R020HFHX000T	0	36 X 9 X 0.35	95	20.60	30.70	4.8	--	--	--	0.64
	R020HFHXR10T	1			20.60	32.50	65	260	205.00	58.00	0.96
	R020HFHXR20T	2			20.60	33.90	97.5	390	--	--	1.28
1"	R025HFHX000T	0	36 X 10 X 0.35	98	27.30	38.50	2.8	--	--	--	0.80
	R025HFHXR10T	1			27.30	40.30	50	200	230.00	70.00	1.17
	R025HFHXR20T	2			27.30	41.70	75	300	--	--	1.54
1 1/4"	R032HFHX000T	0	48 X 9 X 0.4	95	31.60	45.00	1.7	--	--	--	0.94
	R032HFHXR10T	1			31.60	46.60	42	168	270.00	90.00	1.49
	R032HFHXR20T	2			31.60	48.20	63	252	--	--	2.05
1 1/2"	R040HFHX000T	0	48 X 10 X 0.4	95	40.30	55.00	1.4	--	--	--	1.13
	R040HFHXR10T	1			40.30	56.60	38	152	310.00	100.00	1.75
	R040HFHXR20T	2			40.30	58.20	57	228	--	--	2.37
2"	R050HFHX000T	0	48 X 10 X 0.5	95	49.50	65.00	1	--	--	--	1.46
	R050HFHXR10T	1			49.50	67.00	37	148	390.00	130.00	2.46
	R050HFHXR20T	2			49.50	69.00	56	222	--	--	3.46
2 1/2"	R065HFHX000T	0	72 X 8 X 0.5	94	64.80	83.00	0.8	--	--	--	1.59
	R065HFHXR10T	1			64.80	85.00	34	136	460.00	200.00	2.76
	R065HFHXR20T	2			64.80	87.00	51	204	--	--	3.94
3"	R080HFHX000T	0	72 X 9 X 0.5	96	79.80	97.50	0.7	--	--	--	1.78
	R080HFHXR10T	1			79.80	100.00	27	108	570.00	230.00	3.09
	R080HFHXR20T	2			79.80	102.00	40.5	162	--	--	4.39
4"	R100HFHX000T	0	72 X 11 X 0.5	96	99.80	120.00	0.6	--	--	--	2.50
	R100HFHXR10T	1			99.80	122.50	20	80	690.00	330.00	4.10
	R100HFHXR20T	2			99.80	124.50	30	120	--	--	5.69
5"	R125HFHX000T	0	72 X 11 X 0.7	93	130.00	154.00	0.4	--	--	--	3.60
	R125HFHXR10T	1			130.00	157.00	16	64	1000.00	350.00	6.72
	R125HFHXR20T	2			130.00	159.80	24	96	--	--	9.84
6"	R150HFHX000T	0	72 X 12 X 0.7	90	154.00	180.00	0.3	--	--	--	5.70
	R150HFHXR10T	1			154.00	183.00	12	48	1250.00	400.00	9.10
	R150HFHXR20T	2			154.00	185.80	18	72	--	--	12.50
8"	R200HFHX000T	0	96 X 9 X 0.7	90	204.00	233.40	0.3	--	--	--	8.40
	R200HFHXR10T	1			204.00	237.00	10	40	1600.00	520.00	12.45
	R200HFHXR20T	2			204.00	239.80	15	60	--	--	16.50
10"	R250HFHX000T	0	96 X 12 X 0.7	90	254.00	284.00	0.2	--	--	--	10.50
	R250HFHXR10T	1			254.00	287.00	8.5	34	2000.00	620.00	16.15
	R250HFHXR20T	2			254.00	289.80	12.75	51	--	--	21.81

Note:

1. Test pressure is 1.5 times of working pressure @ 20°c.
2. WP - Working Pressure, BP - Burst Pressure.



1.8 PH 2400 SERIES - HFM

Structure : Annular Corrugated Hydroformed flexible metal hoses produced from longitudinally welded tubes with or without braiding

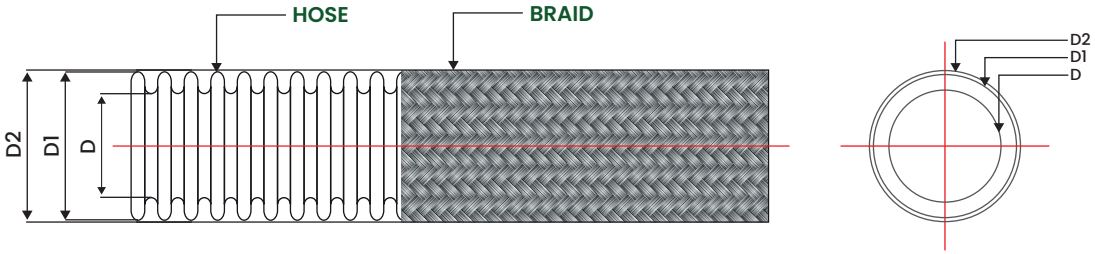
Characteristics : Standard Pitch / Medium Flexibility / Light weight / Hydro Formed

Standards : EN ISO 10380

Hose material : Stainless Steel AISI 304, AISI 321, AISI 316L

Braiding material : Stainless Steel AISI 304, AISI 304L, AISI 316L & AISI 321

Suitable fittings types : Threaded end, Flange end, Pipe end, etc. as per customer specifications

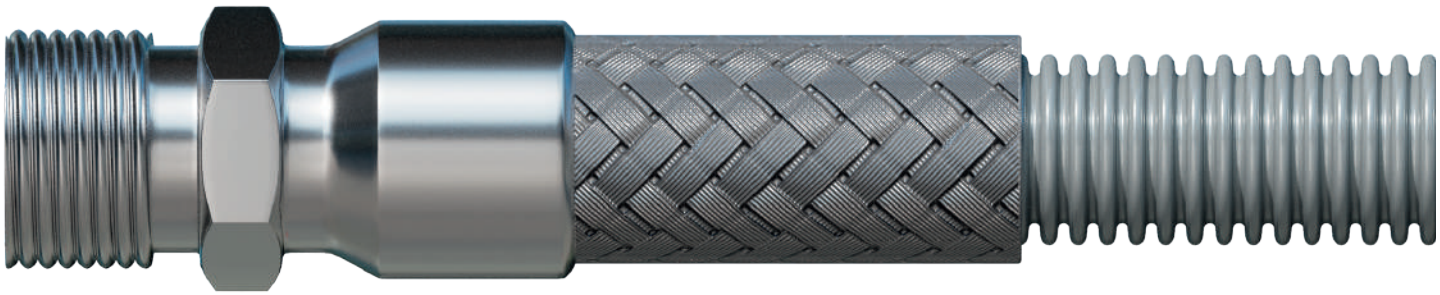


SIZE	ITEM CODE	BRAIDS	BRAID CONSTRUCTION (NO OF CARRIERS X NO OF STRANDS X WIRE DIAMETER)	BRAID	ID	OD	WP	BP	BR/r		W
				COVERAGE	(D)	(D1 & D2)	(Max) @20°C	(Min) @20°C	DYNAMIC	STATIC	WEIGHT
				%	mm	mm	bar	bar	mm	mm	kg/m
1 1/2"	R040HFMX000T	0	48 X 9 X 0.4	92	40.30	51.50	1.2	--	--	--	0.49
	R040HFMXR10T	1			40.30	53.10	30	120	340	130	1.05
	R040HFMXR20T	2			40.30	54.70	45	180	--	--	1.61
2"	R050HFMX000T	0	48 X 10 X 0.4	96	49.50	62.70	1	--	--	--	0.65
	R050HFMXR10T	1			49.50	64.30	24	96	390	160	1.27
	R050HFMXR20T	2			49.50	65.90	36	144	--	--	1.88
2 1/2"	R065HFMX000T	0	72 X 7 X 0.5	94	64.80	78.30	0.8	--	--	--	0.85
	R065HFMXR10T	1			64.80	80.30	22	88	460	200	1.88
	R065HFMXR20T	2			64.80	82.30	33	132	--	--	2.91
3"	R080HFMX000T	0	72 X 8 X 0.5	96	79.80	96.50	0.7	--	--	--	1.15
	R080HFMXR10T	1			79.80	98.50	18	72	660	240	2.35
	R080HFMXR20T	2			79.80	100.50	27	108	--	--	3.54

4"	R100HFMX000T	0	72 X 10 X 0.5	94	99.80	116.20	0.55	--	--	--	1.42
	R100HFMXR10T	1			99.80	118.20	16	64	750	290	2.89
	R100HFMXR20T	2			99.80	120.20	24	96	--	--	4.36
5"	R125HFMX000T	0	72 X 10 X 0.6	92	130.00	154.00	0.4	--	--	--	2.90
	R125HFMXR10T	1			130.00	157.50	14	56	1000	350	5.13
	R125HFMXR20T	2			130.00	159.90	21	84	--	--	7.34
6"	R150HFMX000T	0	72 X 11 X 0.6	90	154.00	180.50	0.3	--	--	--	3.42
	R150HFMXR10T	1			154.00	182.50	10	40	1250	400	5.91
	R150HFMXR20T	2			154.00	184.90	15	60	--	--	8.40
8"	R200HFMX000T	0	96 X 9 X 0.67	90	204.00	233.40	0.3	--	--	--	5.60
	R200HFMXR10T	1			204.00	236.00	8	32	1600	520	8.64
	R200HFMXR20T	2			204.00	238.68	12	48	--	--	11.69
10"	R250HFMX000T	0	96 X 12 X 0.7	90	254.00	282.00	0.2	--	--	--	8.31
	R250HFMXR10T	1			254.00	285.00	7.5	30	2000	620	13.97
	R250HFMXR20T	2			254.00	287.80	11.25	45	--	--	19.62
12"	R300HFMX000T	0	96 X 14 X 0.7	94	312.00	348.00	0.2	--	--	--	10.80
	R300HFMXR10T	1			312.00	352.00	6	24	2400	725	18.20
	R300HFMXR20T	2			312.00	354.80	9	36	--	--	25.60

Note:

1. Test pressure is 1.5 times of working pressure @ 20°c.
2. WP - Working Pressure, BP - Burst Pressure.



1.9 PH 2500 SERIES - HMH

Structure : Annular Corrugated Mechanical / Hydroformed flexible metal hoses produced from longitudinally welded tubes with or without braiding

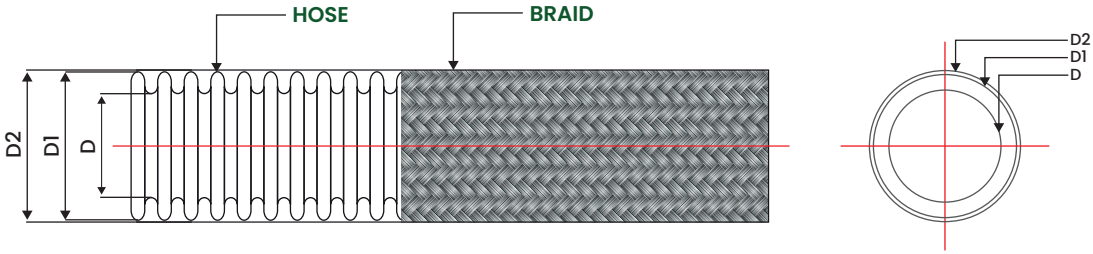
Characteristics : Standard Pitch / standard Flexibility / Heavy Duty

Standards : EN ISO 10380

Hose material : Stainless Steel AISI 304, AISI 321, AISI 316L

Braiding material : Stainless Steel AISI 304, AISI 304L, AISI 316L & AISI 321

Suitable fittings types : Threaded end, Flange end, Pipe end, etc. as per customer specifications



SIZE	ITEM CODE	BRAIDS	BRAID CONSTRUCTION (NO OF CARRIERS X NO OF STRANDS X WIRE DIAMETER)	BRAID	ID	OD	WP	BP	BR/r		W
				COVERAGE	(D)	(D1 & D2)	(Max) @20°C	(Min) @20°C	DYNAMIC	STATIC	WEIGHT
				%	mm	mm	bar	bar	mm	mm	kg/m
1/4"	R006HMHX000T	0	24 X 5 X0.35	90	6.00	10.16	14	--	--	--	0.13
	R006HMHXR10T	1			6.00	11.43	146	584	127.00	25.00	0.25
	R006HMHXR20T	2			6.00	12.95	219	875	--	--	0.37
3/8"	R010HMHX000T	0	24X 7X 0.35	92	11.00	16.21	7	--	--	--	0.19
	R010HMHXR10T	1			11.00	17.53	103	414	140.00	32.00	0.36
	R010HMHXR20T	2			11.00	19.05	155	621	--	--	0.54
1/2"	R012HMHX000T	0	24X 7X 0.35	85	14.50	21.11	6	--	--	--	0.33
	R012HMHXR10T	1			14.50	22.61	74	297	152.00	38.00	0.49
	R012HMHXR20T	2			14.50	23.88	111	445	--	--	0.65
3/4"	R020HMHX000T	0	36 X 8 X 0.35	90	20.60	30.71	5	--			0.64
	R020HMHXR10T	1			20.60	32.00	55	218	203	57	0.94
	R020HMHXR20T	2			20.60	33.53	82	328	--	--	1.24

1"	R025HMHX000T	0	36X 9X 0.35	85	27.30	38.5	3	--	--	--	0.80
	R025HMHXR10T	1			27.30	39.9	39	158	229.00	70.00	1.13
	R025HMHXR20T	2			27.30	41.40	59	236	--	--	1.46
1 1/4"	R032HMHX000T	0	48 X 7 X 0.4	85	31.60	45.0	2	--	--	--	0.94
	R032HMHXR10T	1			31.60	46.5	37	147	267.00	89.00	1.40
	R032HMHXR20T	2			31.60	48.26	55	220	--	--	1.86
1 1/2"	R040HMHX000T	0	48 X 9 X 0.4	88	40.30	55.0	1	--	--	--	1.13
	R040HMHXR10T	1			40.30	56.64	33	130	305.00	102.00	1.71
	R040HMHXR20T	2			40.30	58.17	49	195	--	--	2.29
2"	R050HMHX000T	0	48 X 9 X 0.5	90	49.50	65.00	1	--	--	--	1.46
	R050HMHXR10T	1			49.50	67.06	36	142	381.00	127.00	2.38
	R050HMHXR20T	2			49.50	69.09	53	213	--	--	3.30
2 1/2"	R065HMHX000T	0	72 X 7 X 0.5	88	64.80	83.01	1	--	--	--	1.58
	R065HMHXR10T	1			64.80	85.1	27	107	508	203	2.62
	R065HMHXR20T	2			64.80	87.12	40	160	--	--	3.68
3"	R080HMHX000T	0	72 X 8 X 0.5	87	79.80	97.51	1	--	--	--	1.79
	R080HMHXR10T	1			79.80	99.57	22	87	559	229	2.98
	R080HMHXR20T	2			79.80	101.60	33	131	--	--	4.14
4"	R100HMHX000T	0	72 X 10 X 0.5	85	99.80	120.0	1	--	--	--	2.50
	R100HMHXR10T	1			99.80	121.92	16	64	686	330	3.97
	R100HMHXR20T	2			99.80	123.95	24	96	--	--	5.45
5"	R125HMHX000T	0	72 X 8 X0.65	75	130.00	154.00	0	--	--	--	3.60
	R125HMHXR10T	1			130.00	156.72	13	53	787	457	5.46
	R125HMHXR20T	2			130.00	159.26	20	79	--	--	7.32
6"	R150HMHX000T	0	96 X 12 X0.5	90	154.00	180.5	0	--	--	--	5.69
	R150HMHXR10T	1			154.00	182.12	11	46	914	483	7.60
	R150HMHXR20T	2			154.00	183.90	17	68	--	--	9.51

Note:

1. Test pressure is 1.5 times of working pressure @ 20°c.
2. WP - Working Pressure, BP - Burst Pressure.

1.10 PH 2600 SERIES – WMW

- Material available in SS 304, SS 304L / SS 316L
- Clean and oil-free
- Soft texture allows for easy trimming and quicker hose assembly fabrication
- Engineered for optimal hose coverage
- Characteristics-Medium weight
- Mechanical formed metal hose braid

SIZE	ITEM CODE	BRAIDS	BRAID CONSTRUCTION (NO OF CARRIERS X NO OF STRANDS X WIRE DIAMETER)	BRAID COVERAGE	BRAID ID	BRAID OD	WEIGHT
				%	mm	mm	kg/m
1/4"	W006WMWXR10T	1	24 X 5 X 0.3	94	9.60	10.80	0.09
5/16"	W008WMWXR10T	1	24 X 5 X 0.3	92	12.10	13.60	0.09
3/8"	W010WMWXR10T	1	24 X 6 X 0.3	92	14.10	15.70	0.12
1/2"	W012WMWXR10T	1	24 X 8 X 0.3	92	16.70	18.20	0.17
5/8"	W016WMWXR10T	1	36 X 7 X 0.3	96	21.90	23.50	0.19
3/4"	W020WMWXR10T	1	36 X 9 X 0.3	94	26.70	28.20	0.26
1"	W025WMWXR10T	1	36 X 10 X 0.3	96	32.30	33.80	0.3
1.1/4"	W032WMWXR10T	1	48 X 8 X 0.4	94	41.20	43.00	0.50
1.1/2"	W040WMWXR10T	1	48 X 9 X 0.4	92	49.50	51.30	0.58
2"	W050WMWXR10T	1	48 X 10 X 0.4	96	60.70	62.60	0.63
2.1/2"	W065WMWXR10T	1	72 X 7 X 0.5	95	76.30	78.90	1.14
3"	W080WMWXR10T	1	72 X 9 X 0.5	93	94.50	97.10	1.30
4"	W100WMWXR10T	1	72 X 10 X 0.5	88	114.20	116.70	1.40
5"	W125WMWXR10T	1	72 X 10 X 0.6	92	154.00	157.50	2.22
6"	W150WMWXR10T	1	72 X 11 X 0.6	90	180.50	182.50	2.49

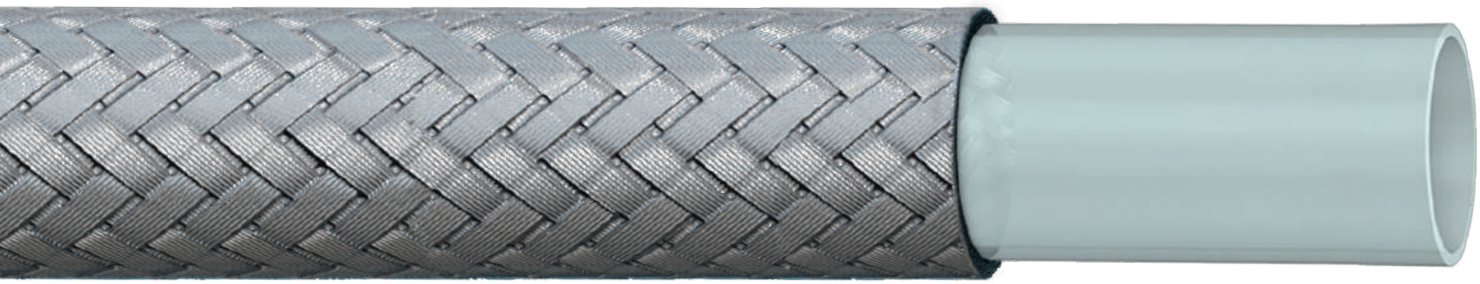
1.11 PH 2700 SERIES - WHW

- Material available in SS 304, SS 304L / SS 316L
- Clean and oil-free
- Soft texture allows for easy trimming and quicker hose assembly fabrication
- Engineered for optimal hose coverage
- Characteristics-Heavy weight

DN	ITEM CODE	BRAIDS	BRAID CONSTRUCTION (NO OF CARRIERS X NO OF STRANDS X WIRE DIAMETER)	BRAID COVERAGE	BRAID ID	BRAID OD	WEIGHT
				%	mm	mm	kg/m
1/4"	W006WHWXR10T	1	24 X 5 X 0.35	98	10.10	12.20	0.13
5/16"	W008WHWXR10T	1	24 X 6 X 0.35	98	12.20	14.50	0.14
3/8"	W010WHWXR10T	1	24 X 8 X 0.35	98	16.20	18.00	0.21
1/2"	W012WHWXR10T	1	24 X 9 X 0.35	94	21.10	22.90	0.23
3/4"	W020WHWXR10T	1	36 X 9 X 0.35	95	30.70	32.50	0.32
1"	W025WHWXR10T	1	36 X 10 X 0.35	98	38.50	40.30	0.37
1.1/4"	W032WHWXR10T	1	48 X 9 X 0.4	95	45.00	46.60	0.56
1.1/2"	W040WHWXR10T	1	48 X 10 X 0.4	95	55.00	56.60	0.62
2"	W050WHWXR10T	1	48 X 10 X 0.5	95	65.00	67.00	1.00
2.1/2"	W065WHWXR10T	1	72 X 8 X 0.5	94	83.00	85.00	1.17
3"	W080WHWXR10T	1	72 X 9 X 0.5	96	97.50	100.00	1.30
4"	W100WHWXR10T	1	72 X 11 X 0.5	96	120.00	122.50	1.59
5"	W125WHWXR10T	1	72 X 11 X 0.7	93	154.00	157.00	3.12
6"	W150WHWXR10T	1	72 X 12 X 0.7	90	180.00	183.00	3.40
8"	W200WHWXR10T	1	96 X 9 X 0.7	90	233.40	237.00	4.05
10"	W250WHWXR10T	1	96 X 12 X 0.7	90	284.00	287.00	5.66
12"	W300WHWXR10T	1	96 X 14 X 0.7	94	348.00	352.00	7.4

1.12 PH 179 - R14

Applicable Standard: SAE J517 - 100R14



Construction

Core : Sintered tube of polytetrafluoroethylene (P.T.F.E)

Reinforcement : Single braid of 304 series of stainless steel wire

Application : P.T.F.E hose has an excellent temperature characteristics both in high and low temperature, Excellent chemical resistance, non contamination properties, low coefficient of friction and resists deterioration. Therefore the hose is used generally in application

ITEM CODE	DASH SIZE	WT	ID		OD		WP		BP		BR/r		W
			inch	mm	inch	mm	psi	bar	psi	bar	inch	mm	g/m
PH179-3	-3	1.00	1/8	3.35	0.252	6.4	3,260	225	13,040	900	1.6	40	65
PH179-4	-4	0.75	3/16	4.83	0.300	7.6	3,000	210	12,000	840	2.0	50	84
PH179-5	-5	0.65	1/4	6.48	0.380	9.7	3,000	210	12,000	840	3.0	75	121
PH179-6	-6	0.75	5/16	8.00	0.440	11.2	2,500	175	10,000	700	4.0	100	163
PH179-7	-7	0.75	3/8	9.65	0.495	12.6	2,400	165	9,600	660	5.0	125	170
PH179-8	-8	0.75	13/32	10.41	0.543	13.8	2,000	140	8,000	560	5.3	135	185
PH179-10	-10	0.75	1/2	12.83	0.650	16.5	1,750	120	7,000	480	6.5	165	234
PH179-12	-12	0.90	5/8	16.00	0.780	19.8	1,270	88	5,080	352	8.0	200	318
PH179-14	-14	0.90	3/4	19.18	0.900	22.9	1,100	75	4,400	300	9.1	230	395
PH179-16	-16	1.00	7/8	22.23	1.030	26.2	900	62	3,600	248	9.1	230	462
PH179-18	-18	1.05	1	25.53	1.160	29.5	900	62	3,600	248	11.8	300	528
PH179-20	-20	1.20	1.1/8	28.58	1.300	33.0	630	44	2,520	176	16.1	410	585

Temperature Range: Continuous: -54°C to +260°C

Double braided available for higher performance, please check our part # PH381

1.13 PH 370 - PTFE - CONVOLUTED HOSE

Applicable Standard: Polyhose proprietary product

Construction

Core : Helically convoluted sintered tube of polytetrafluoroethylene (P.T.F.E)

Reinforcement : Single braid of 304 / 316 series of stainless steel wire

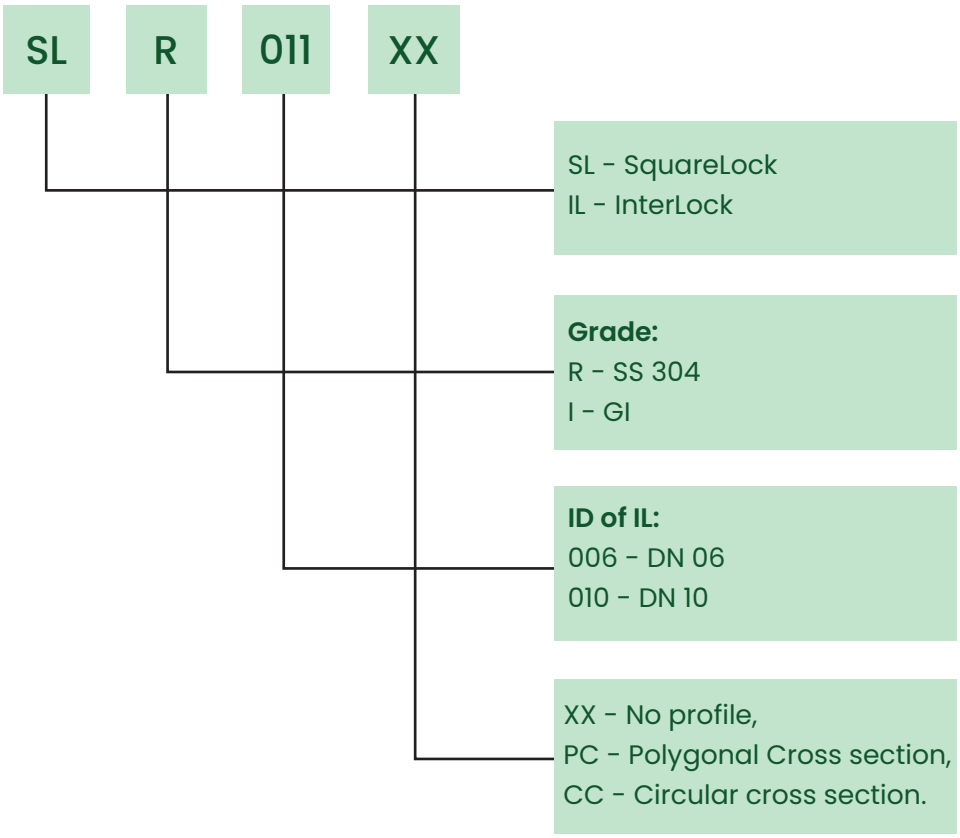
Application : P.T.F.E hose has an excellent temperature characteristics both in high and low temperature. Excellent chemical resistance, non contamination properties, low coefficient of friction and resists deterioration. Therefore the hose is used generally in applications where all or one of the above properties is the main criteria in automotive, chemical, pharmaceutical & food processing, plastic & rubber molding machines. Also for some applications the tube can also be made conductive to dissipate electro -static charges.

ITEM CODE	DASH SIZE	WT	ID		OD		WP		BP		BR/r		W
			inch	mm	inch	mm	psi	bar	psi	bar	inch	mm	g/m
PH370-04	-4	0.75	1/4	6.60	0.410	10.4	2,500	175	10,000	700	0.8	20	149
PH370-05	-4	0.75	5/16	8.18	0.490	12.4	2,300	160	9,200	640	0.8	20	170
PH370-06	-6	0.75	3/8	9.65	0.540	13.7	1,740	120	6,960	480	0.8	20	182
PH370-08	-8	0.75	1/2	12.83	0.725	18.4	1,595	110	6,380	440	1.0	25	289
PH370-10	-10	0.80	5/8	16.00	0.827	21.0	1,450	100	5,800	400	2.0	50	349
PH370-12	-12	0.90	3/4	19.18	1.020	25.9	1,160	80	4,640	320	2.6	65	494
PH370-14	-14	1.00	7/8	22.23	1.170	29.7	870	60	3,480	240	3.1	80	565
PH370-16	-16	1.00	1	25.53	1.331	33.8	800	55	3,200	220	3.6	90	677
PH370-20	-20	1.00	1.1/4	31.88	1.680	42.7	665	45	2,660	180	4.4	110	891
PH370-24	-24	1.00	1.1/2	38.23	1.890	48.0	510	35	2,040	140	6.0	150	959
PH370-32	-32	1.10	2	50.93	2.420	61.5	365	25	1,460	100	8.0	200	1309
PH370-40	-40	1.30	2.1/2	63.50	3.346	85.0	254	17,5	1,016	70	8.0	250	1450
PH370-48	-48	1.30	3	76.00	3.504	89.0	236	16,3	944	65	8.0	310	1550

Temperature Range: Continuous: -54°C to +260°C

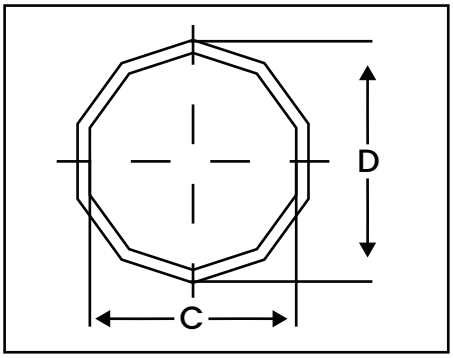
Working and burst pressure are at 20 Deg C Temperature . Available in electrical conductive version also and our part # shall be PH 371

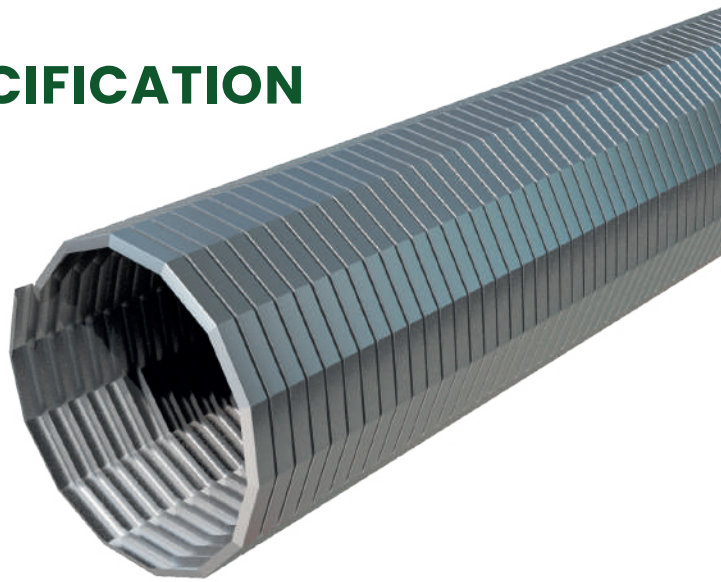
1.14 PRODUCT NOMENCLATURE (Stripwound Hose)



DOUBLE INTERLOCK

1.15 PH 2800 TECHNICAL SPECIFICATION FOR DOUBLE INTERLOCK



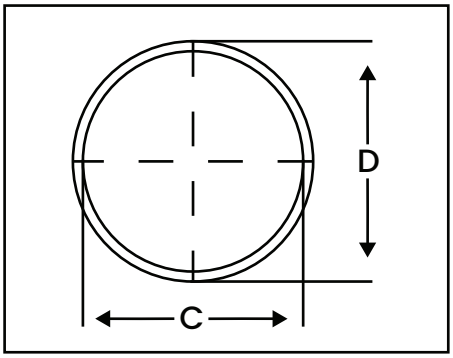


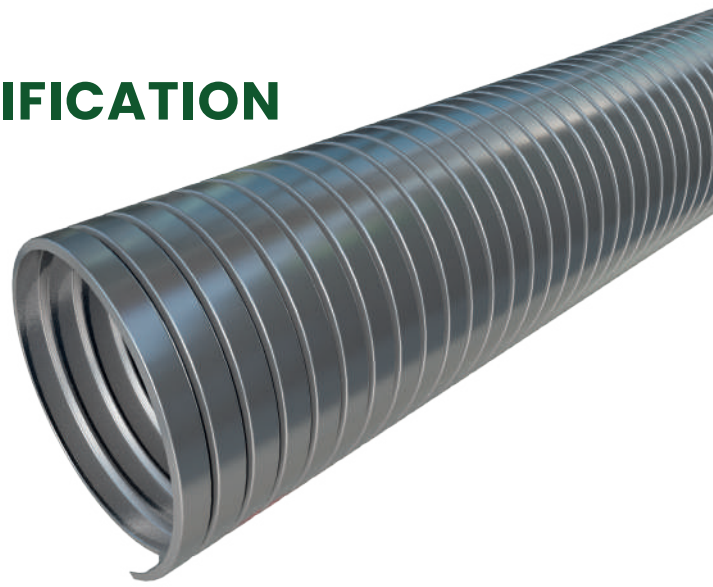
POLYGONAL CROSS SECTION

PART NO	INTERLOCK - UNPACKED									
	NOMINAL SIZE		ID (C)		OD (D)		WEIGHT ±10%		MIN BEND RAD +10%	
	INCH	MM	MM	INCH	MM	INCH	KG/M	LBS	MM	INCH
IL R 038 PC	1.1/2"	38	38	1.50	42	1.654	0.900	0.604	180	7.087
IL R 040 PC		40	40	1.57	44	1.732	1.090	0.731	200	7.874
IL R 045 PC	1.3/4"	45	45	1.77	49	1.929	1.220	0.819	225	8.858
IL R 046 PC		46	46	1.81	50	1.969	1.260	0.845	230	9.055
IL R 051 PC	2	51	51	2.01	55	2.165	1.430	0.960	250	9.843
IL R 052 PC		52	52	2.05	56	2.205	1.490	1.000	260	10.236
IL R 057 PC	2.1/4"	57	57	2.24	61	2.402	1.640	1.100	275	10.827
IL R 060 PC		60	60	2.36	64.5	2.539	1.750	1.174	300	11.811
IL R 065 PC	2.1/2"	65	65	2.56	67.5	2.657	1.910	1.282	325	12.795
IL R 070 PC		70	70	2.76	74.5	2.933	2.070	1.389	350	13.780
IL R 076 PC	3"	76	76	2.99	80.5	3.169	2.230	1.496	375	14.764
IL R 080 PC		80	80	3.15	84.5	3.327	2.390	1.604	400	15.748
IL R 085 PC		85	85	3.35	89.5	3.524	2.550	1.711	425	16.732
IL R 087 PC		87	87	3.43	91.5	3.602	2.610	1.751	435	17.126
IL R 090 PC	3.1/2"	90	90	3.54	94.5	3.720	2.700	1.812	450	17.717
IL R 101 PC	4"	101	101	3.98	105.5	4.154	3.000	2.013	500	19.685
IL R 110 PC		110	110	4.33	114.5	4.508	3.480	2.335	550	21.654
IL R 115 PC		115	115	4.53	119.5	4.705	3.720	2.496	575	22.638
IL R 120 PC		120	120	4.72	124.5	4.902	3.960	2.657	600	23.622
IL R 130 PC		130	130	5.12	134.5	5.295	4.320	2.899	650	25.591
IL R 140 PC		140	140	5.51	144.5	5.689	4.500	3.020	700	27.559
IL R 150 PC	6"	150	150	6	154.5	6.083	4.700	3.154	750	29.528

DOUBLE INTERLOCK

1.16 PH 2810 TECHNICAL SPECIFICATION FOR DOUBLE INTERLOCK





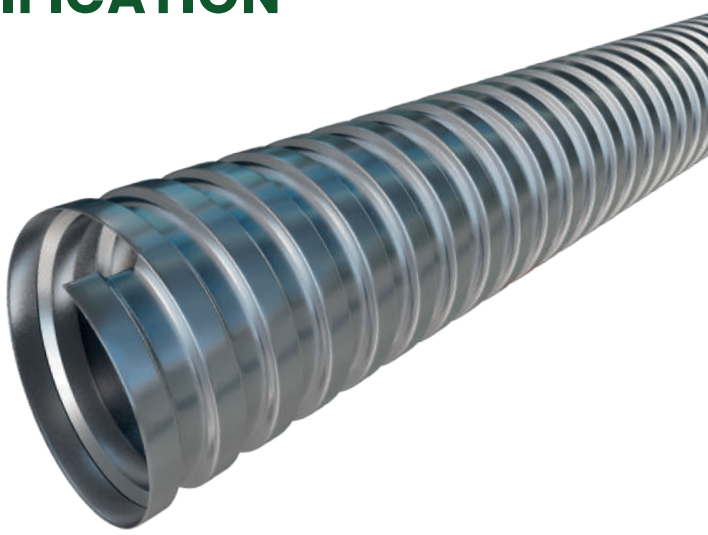
CIRCULAR CROSS SECTION

PART NO	INTERLOCK - UNPACKED									
	NOMINAL SIZE		ID (C)		OD (D)		WEIGHT		MIN BEND RAD +10%	
	INCH	MM	MM	INCH	MM	INCH	KG/M	LBS	MM	INCH
IL R 009 CC	3/8"	9	9	0.35	12	0.472	0.145	0.097	45	1.772
IL R 010 CC		10	10	0.39	13	0.512	0.160	0.107	50	1.969
IL R 011 CC		11	11	0.43	14	0.551	0.190	0.127	55	2.165
IL R 012 CC		12	12	0.47	15	0.591	0.213	0.143	65	2.559
IL R 013 CC	1/2"	13	13	0.51	16	0.630	0.230	0.154	70	2.756
IL R 014 CC		14	14	0.55	17	0.669	0.248	0.166	75	2.953
IL R 015 CC		15	15	0.59	18	0.709	0.265	0.178	80	3.150
IL R 016 CC	5/8"	16	16	0.63	19	0.748	0.283	0.190	82	3.228
IL R 017 CC		17	17	0.67	20	0.787	0.301	0.202	85	3.346
IL R 018 CC		18	18	0.71	21	0.827	0.319	0.214	90	3.543
IL R 018 CC		18	18	0.71	22	0.866	0.335	0.225	90	3.543
IL R 019 CC	3/4"	19	19	0.75	23	0.906	0.350	0.235	95	3.740
IL R 020 CC		20	20	0.79	24	0.945	0.370	0.248	100	3.937
IL R 021 CC		21	21	0.83	25	0.984	0.390	0.262	105	4.134
IL R 022 CC		22	22	0.87	26	1.024	0.400	0.268	110	4.331
IL R 023 CC		23	23	0.91	27	1.063	0.420	0.282	115	4.528
IL R 024 CC		24	24	0.94	28	1.102	0.440	0.295	120	4.724
IL R 025 CC	1"	25	25	0.98	29	1.142	0.460	0.309	125	4.921
IL R 026 CC		26	26	1.02	30	1.181	0.480	0.322	130	5.118
IL R 027 CC		27	27	1.06	31	1.220	0.500	0.336	135	5.315
IL R 028 CC	1.1/8"	28	28	1.10	32	1.260	0.520	0.349	140	5.512
IL R 029 CC		29	29	1.14	33	1.299	0.540	0.362	145	5.709
IL R 032 CC	1.1/4"	32	32	1.26	35.0	1.378	0.580	0.389	160	6.299
IL R 040 CC	1.1/2"	40	40	1.57	43.5	1.713	0.690	0.463	180	7.087
IL R 045 CC	1.3/4"	45	45	1.77	48.5	1.909	0.800	0.537	190	7.480

IL R 050 CC	2"	50	50	1.97	53.5	2.106	1.450	0.973	205	8.071
IL R 055 CC	2.3/16"	55	55	2.17	59.5	2.343	1.600	1.074	225	8.858
IL R 060 CC	2.3/8"	60	60	2.36	64.0	2.520	1.740	1.168	234	9.213
IL R 065 CC	2.1/2"	65	65	2.56	69.0	2.717	1.890	1.268	245	9.646
IL R 070 CC	2.5/8"	70	70	2.76	74.0	2.913	2.030	1.362	273	10.748
IL R 075 CC	3"	75	75	2.95	79.0	3.110	2.180	1.463	293	11.535
IL R 080 CC	3.5/16"	80	80	3.15	84.0	3.307	2.320	1.557	312	12.283
IL R 085 CC	3.3/8"	85	85	3.35	89.0	3.504	2.450	1.644	330	12.992
IL R 100 CC	4"	100	100	3.94	105.0	4.134	2.900	1.946	390	15.354
IL R 110 CC	4.3/8"	110	110	4.33	115.0	4.528	3.090	2.073	430	16.929
IL R 120 CC	4.3/4"	120	120	4.72	125.0	4.921	3.480	2.335	468	18.425
IL R 125 CC	5"	125	125	4.92	130.0	5.118	3.630	2.436	490	19.291
IL R 130 CC	5.1/4"	130	130	5.12	135.0	5.315	4.790	3.214	620	24.409
IL R 140 CC	5.5/8"	140	140	5.51	145.0	5.709	5.250	3.523	665	26.181
IL R 150 CC	6"	150	150	5.91	155.0	6.102	5.550	3.724	715	28.150
IL R 190 CC	7.1/2"	190	190	7.48	195.0	7.677	7.000	4.697	905	35.630
IL R 200 CC	8"	200	200	7.9	205.0	8.071	7.400	4.965	950	37.402
IL R 240 CC	9.1/2"	240	240	9.45	245.0	9.646	8.850	5.938	1150	45.276
IL R300 CC	12"	300	300	11.8	305.0	12.008	11.050	7.415	1440	56.693

1.17 PH 2820 TECHNICAL SPECIFICATION FOR SQUARE LOCK

ROUND CROSS SECTION



PART NO	SQUARELOCK - UNPACKED									
	NOMINAL SIZE		ID		OD		WEIGHT ±10%		MIN BEND RAD +10%	
	INCH	MM	MM	INCH	MM	INCH	KG/M	LBS	MM	INCH
SL R 008 XX	3/8"	8	8.73	0.34	11.51	0.453	0.1	0.067	22	0.866
SL R 009 XX		9	9.53	0.38	12.70	0.500	0.11	0.074	25	0.984
SL R 011 XX		11	11.11	0.44	14.29	0.563	0.12	0.081	31	1.220
SL R 012 XX	1/2"	12	12.7	0.50	15.88	0.625	0.125	0.084	32	1.260
SL R 014 XX		14	14.29	0.56	17.46	0.687	0.140	0.094	35	1.378
SL R 015 XX		15	15.88	0.63	19.05	0.750	0.150	0.101	37	1.457
SL R 019 XX	3/4"	19	19.05	0.75	24.61	0.969	0.215	0.144	40	1.575
SL R 022 XX		22	22.23	0.88	25.4	1.000	0.280	0.188	48	1.890
SL R 025 XX	1"	25	25.40	1.00	28.58	1.125	0.292	0.196	60	2.362

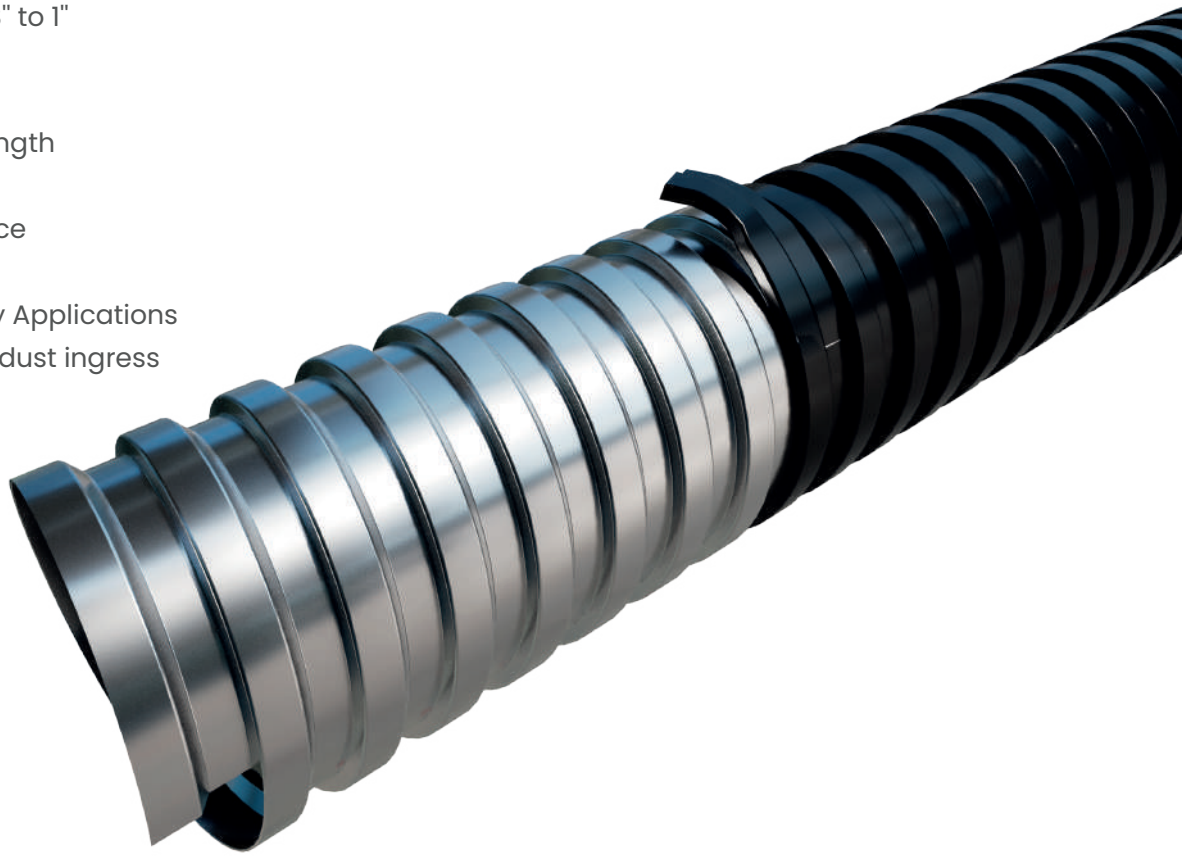
1.18 PH 2830 FLEXIBLE METALIC ELECTRICAL CONDUIT

Conduit:

Construction : SS 304/GI, Helically wound, flexible conduit with PVC coating
Application : General factory Wiring & Connections to machine
Temp : -15°C to 70°C
Size : 3/8" to 1"

Key Features:

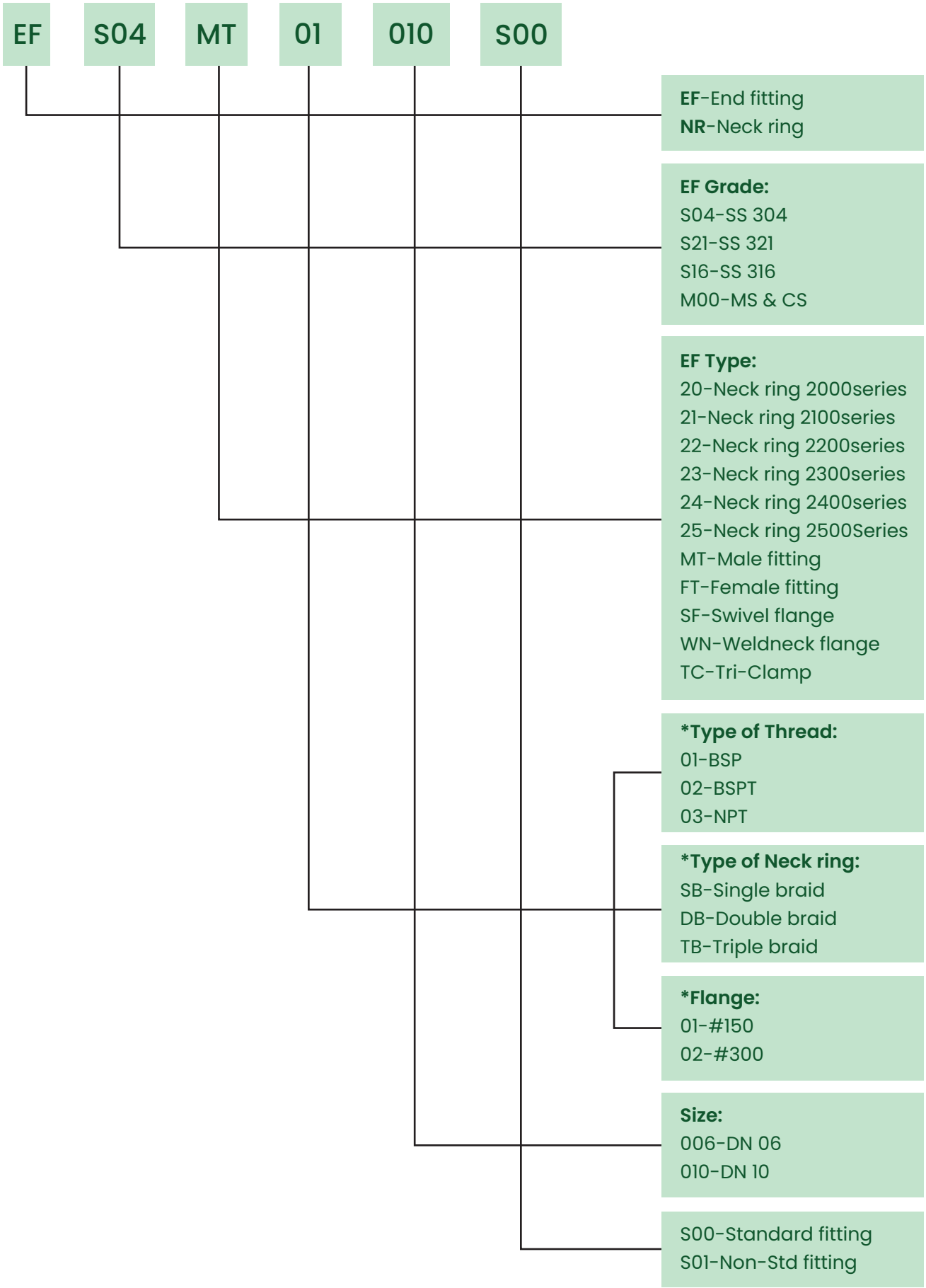
- High Compression Strength
- High Pull-Off Strength
- High Abrasion Resistance
- High Impact Strength
- Suitable for Heavy-Duty Applications
- Reduce risk of water or dust ingress



PART NO	NOMINAL SIZE		ID		SQUARELOCK-OD		PVC THICK	
	INCH	MM	MM	INCH	MM	INCH	MM	INCH
PH 2830-008	3/8"	8	8.73	0.34	11.51	0.453	0.3-0.5	0.012-0.020
PH 2830-009		9	9.53	0.38	12.70	0.500	0.3-0.5	0.012-0.020
PH 2830-011		11	11.11	0.44	14.29	0.563	0.3-0.5	0.012-0.020
PH 2830-012	1/2"	12	12.7	0.50	15.88	0.625	0.3-0.5	0.012-0.020
PH 2830-014		14	14.29	0.56	17.46	0.687	0.3-0.5	0.012-0.020
PH 2830-015		15	15.88	0.63	19.05	0.750	0.3-0.5	0.012-0.020
PH 2830-019	3/4"	19	19.05	0.75	24.61	0.969	0.3-0.5	0.012-0.020
PH 2830-022		22	22.23	0.88	25.4	1.000	0.3-0.5	0.012-0.020
PH 2830-025	1"	25	25.40	1.00	28.58	1.125	0.3-0.5	0.012-0.020

END FITTINGS

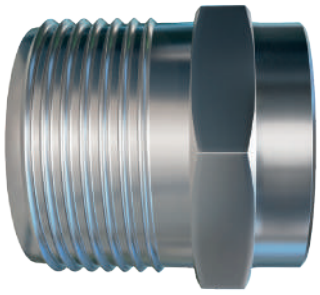
2.1 PRODUCT NOMENCLATURE (End Fitting)



Note: * As per customer requirement.

2.2 END FITTING

Weldmale



Material : SS 304 / SS 316L /CS

Thread : BSP-01, BSPT-02, NPT-03, NPSM-04, GasPitch-05, M22 X1.5-06

SIZE	1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	2.1/2"	3"
L(IN)	1.04	1.04	1.20	1.310	1.390	1.610	1.690	1.730	1.97	1.97

Weld Neck Flange / Fixed Flange

Material : SS 304 / SS 316L /CS

Flange : ANSI, DIN, JIS, TABLE FLANGE & as per customer req

Class : #150-01, #300-02

SIZE	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	2.1/2"	3"	4"	5"	6"	8"	10"	12"
L(IN)-#150	1.81	2	2.12	2.19	2.38	2.44	2.69	2.69	2.94	3.44	3.44	3.94	3.94	4.44
L(IN)-#300	2	2.19	2.38	2.5	2.63	2.69	2.94	3.06	3.32	3.82	3.82	4.32	4.56	5.06

Swivel Flange

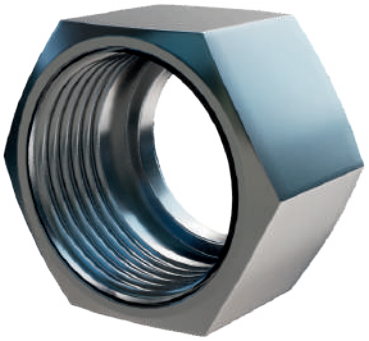
Material : SS 304 / SS 316L / CS

Flange : ANSI, DIN, JIS, TABLE FLANGE & as per customer req

Class : #150-01, #300-02

SIZE	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	2.1/2"	3"	4"	5"	6"	8"	10"	12"
L(IN)-#150	0.38	0.44	0.5	0.56	0.62	0.69	0.81	0.88	0.88	0.88	0.94	1.06	1.12	1.19
L(IN)-#300	0.5	0.56	0.62	0.69	0.75	0.81	0.94	1.06	1.19	1.31	1.38	1.56	1.81	1.94

Hex Nut / Female



Material : SS 304 / SS 316L / CS

Thread : BSP, BSPT, NPT, NPSM

Thread : BSP-01, BSPT-02, NPT-03, NPSM-04, GasPitch-05, M22 X1.5-06

SIZE	1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	3"
L(IN)	0.669	0.709	0.787	0.866	0.945	1.024	1.102	1.181	1.378
AF(IN)	0.748	0.866	1.063	1.260	1.496	1.969	2.165	2.559	3.858

TC -Clamp

Material : SS 304 / SS 316L /CS

SIZE	1/2"	3/4"	1"	1.1/2"	2"	2.1/2"	3"	4"	6"	8"
A(IN)	1.125	1.125	1.125	1.125	1.125	1.125	1.125	1.125	1.5	1.5
B(IN)	0.370	0.620	0.870	1.370	1.870	2.370	2.870	3.834	5.782	7.760
C(IN)	0.5	0.75	1	1.5	2	2.5	3	4	6	8

ASSEMBLED HOSE

3.1 CORRUGATED METAL HOSE
(DESIGNING AN ASSEMBLY)

Analyzing an Application

S.T.A.M.P.E.D.

To properly design a metal hose assembly for a particular application, the following design parameters must be determined. To help remember them, they have been arranged to form the acronym "S.T.A.M.P.E.D."

Size

The diameter of the connections in which the assembly will be installed is needed to provide a proper fit. This information is required.

Temperature

As the temperature to which the assembly is exposed (internally and externally) increases, the strength of the assembly's components decreases. Also, the coldest temperature to which the hose will be exposed can affect the assembly procedure and/or fitting materials. If you do not provide this information, it will be assumed that the temperature is 20°C.

Application

This refers to the configuration in which the assembly is installed. This includes both the dimensions of the assembly as well as the details of any movement that the assembly will experience. This information is necessary to calculate assembly length and required flexibility.

Media

Identify all chemicals to which the assembly will be exposed, both internally and externally. This is important since you must be sure that the assembly's components are chemically compatible with the media going through the hose as well as the environment in which the hose is installed. If no media is given, it will be assumed that both the media and the external environment are compatible with all of the available materials for each component.

Pressure

Identify the internal pressure to which the assembly will be exposed. Also, determine if the pressure is constant or if there are cycles or spikes. This information is important to determine if the assembly is strong enough for the application. If no pressure is given, it will be assumed that the pressure is low and there are no pressure surges or spikes.

End fittings

Identify the necessary end fittings. This is required since fittings for the assembly must be chosen to properly fit the mating connections.

Dynamics

Identify the velocity at which the media will flow through the assembly. Since a corrugated metal hose does not have a smooth interior, rapid media flow can set up a resonant frequency that will cause the hose to vibrate and prematurely fail. If no velocity is given, it will be assumed that the velocity is not fast enough to affect the assembly's performance.

3.2 ASSEMBLED HOSE PRODUCT NOMENCLATURE

A	020	G	2	R	1525	MT03	SF01	S16

A- Assembly Hose

ID of Hose
006-DN 06 ID 6.3mm
020-DN 20 ID 20.2mm
250-DN 250 ID 254mm

Grade of Hose
R - Red - SS 304
G-Green – SS 316L
B-Blue – SS 321
Y – Yellow – SS 304L

Type of Braid
0 - Non Braided Hose
1 - Single Braided Hose
2 - Double Braided Hose
3 - Triple Braided Hose

Grade of Braid
R - Red - SS 304
G - Green - SS 316L
Y - Yellow - SS 304L

Length of Hose Assembly in (cm)
0100 - 100 cm Length
1525 - 1525 cm Length.....

Type of End Fittings @Both Ends
MT 01 - BSP Male
MT 02 - BSPT Male
MT 03 - NPT Male
FT 01 - BSP Female Nuts
FT 02 - BSPT Female Nuts
FT 03 - NPT Female Nuts
SF 01 - Swivel Flange# 150
FF 01 - Fixed Flange# 150
SF 02 - Swivel Flange# 300

Grade of Fittings
S04 - SS 304
S16 - SS 316
M00 - CS

Note: Endfitting based on customer requirement

3.3 PH 2900 & PH 2910 PUMP CONNECTOR

This Pump Connector is used to absorb noise and vibration on a piping system, and help to avoid piping stress.

Type:
1. Flexible Flange Pump Connector
2. Threaded Pump Connector

PH 2900 Flexible Flange Pump Connector

Features:

Hose material : SS 304, SS 316L / SS 321
Braid material : SS 304 / SS 316L
Type of braid : Single Braid / Double Braid
Size : DN 50 to DN 300
End fitting : Fixed Flange / Swivel Flange
End fitting material : MS / SS
End fitting dim : #150, #300, Table E& H Flange
Application : Heavy Duty
Packing : Individual box with Weight Balancing Stiffener

HOSE ID (INCH)	PART NO	*OAL (INCH)	*LIVE LENGTH (INCH)	*FITTING LENGTH (EACH END)	WORKING PRESSURE @20°C BAR-SB
2"	PH 2900-050	9"	5.3/4"	5/8"	32
2.1/2"	PH 2900-065	9"	5.3/4"	5/8"	30
3"	PH 2900-080	9"	5.3/4"	5/8"	25
4"	PH 2900-100	9"	5.3/4"	5/8"	19
5"	PH 2900-125	11"	7.1/2"	3/4"	14
6"	PH 2900-150	11"	7.1/2"	3/4"	10
8"	PH 2900-200	12"	8"	1"	8
10"	PH 2900-250	13"	9"	1"	7.5
12"	PH 2900-300	14"	10"	1"	6

PH 2910 Threaded Pump Connector

Features:

Hose material : SS 304, SS 316L / SS 321
Braid material : SS 304 / SS 316L
Type of braid : Single Braid/ Double Braid
Size : DN 12 to DN 50
End fitting : Threaded Male connector / Female Fitting
End fitting material : MS / SS
Application : Low-pressure utility applications.

HOSE ID (INCH)	PART NO	*OAL (INCH)	*LIVE LENGTH (INCH)	*FITTING LENGTH (EACH END)	WORKING PRESSURE @20°C BAR-SB
1/2"	PH 2910-012	6.1/2"	2.1/4"	1.1/2"	75
3/4"	PH 2910-020	7"	2.1/4"	1.1/2"	60
1"	PH 2910-025	8"	3"	1.3/4"	50
1.1/4"	PH 2910-032	8.1/2"	3"	2"	46
1.1/2"	PH 2910-040	9"	3.1/2"	2"	42
2"	PH 2910-050	10.1/2"	4.1/2"	2.1/4"	32
2.1/2"	PH 2910-065	12"	5.1/2"	2.1/2"	30
3"	PH 2910-080	14"	6.1/2"	3"	25
4"	PH 2910-100	16"	7"	3.1/2"	19

Note: *As per Customer requirement

3.4 PH 2920 Extruded hose

Corrugated Braided Hose consist of PH 2000 SERIES-MFM hose & single outer braid with outer jacket of ThermoPlastic Vulcanizates (TPV). End Fitting as per customer requirement.

Extruded Hose Features:

Hose material : PH 2000 SERIES-MFM Hose
Braid material : SS 304
Jacket material : Thermoplastic Vulcanizates(TPV)
Operating temp : -76°F to 275°F

Figure 1 - Extruded Hose Dimensions

SIZE	HOSE ID (INCH)	BRAIDED HOSE OD (INCH)	*EXTRUSION THICKNESS (INCH)	MAWP (PSIG)@ 70°F	MIN STATIC BEND RADIUS (INCH)	MIN DYNAMIC BEND RADIUS (INCH)
1/4"	0.25	0.43	0.019- 0.027	1740	0.98	4.33
5/16"	0.34	0.54	0.019- 0.027	1624	1.26	5.12
3/8"	0.39	0.62	0.019- 0.027	1407	1.5	5.91
1/2"	0.48	0.72	0.019- 0.027	1088	1.77	6.50
5/8"	0.65	0.93	0.019- 0.027	870	2.28	7.68
3/4"	0.8	1.11	0.039- 0.047	870	2.76	8.86
1"	1	1.33	0.039- 0.047	725	3.35	10.24
1.1/4"	1.32	1.69	0.051- 0.059	667	4.13	11.81
1.1/2"	1.58	2.02	0.051- 0.059	609	5.12	13.39
2"	1.98	2.47	0.051- 0.059	464	6.3	15.35

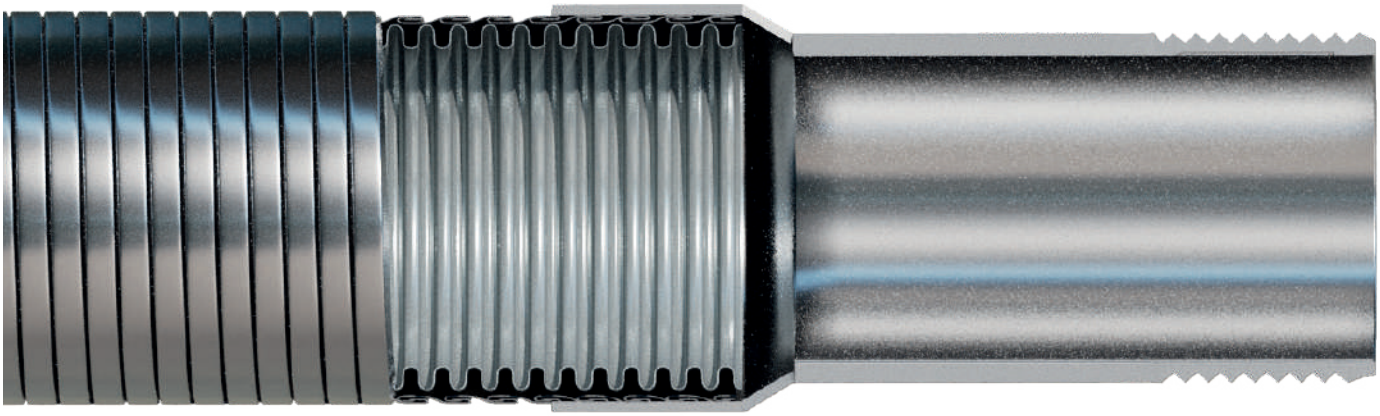
PART NO	SIZE	HOSE ID (MM)	BRAIDED HOSE OD (MM)	*EXTRUSION THICKNESS (MM)	MAWP (BAR) @ 20°C	MIN STATIC BEND RADIUS (MM)	MIN DYNAMIC BEND RADIUS (MM)
PH 2920-006	1/4"	6.4	10.9	0.5-0.7	120	25	110
PH 2920-008	5/16"	8.6	13.7	0.5-0.7	112	32	130
PH 2920-010	3/8"	9.9	15.7	0.5-0.7	97	38	150
PH 2920-012	1/2"	12.2	18.3	0.5-0.7	75	45	165
PH 2920-016	5/8"	16.5	23.6	0.5-0.7	60	58	195
PH 2920-020	3/4"	20.3	28.2	1-1.2	60	70	225
PH 2920-025	1"	25.4	33.8	1-1.2	50	85	260
PH 2920-032	1.1/4"	33.5	42.9	1.3-1.5	46	105	300
PH 2920-040	1.1/2"	40.1	51.3	1.3-1.5	42	130	340
PH 2920-050	2"	50.3	62.7	1.3-1.5	32	160	390

Note:
1. *Extrusion thickness can be modified as per customer requirement.
2. Optional Jacket material: HFFR, PVC & Other Extruded Polymers.

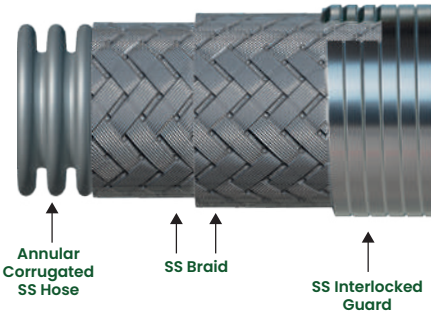
SPECIAL HOSE

3.5 PH 2930 ARMOR

ARMOR

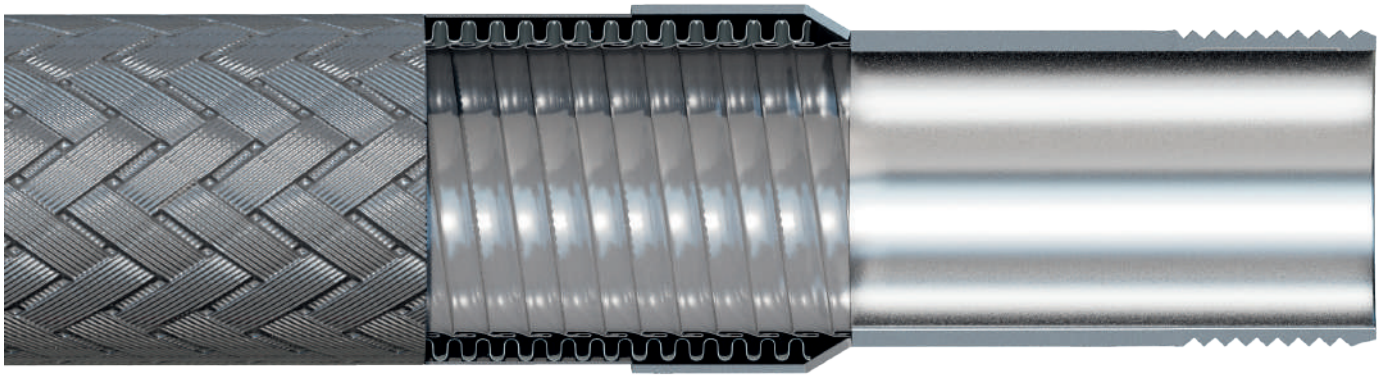


Application: Where a corrugated metal hose could be damaged by rough handling, abrasion, or over-bending.

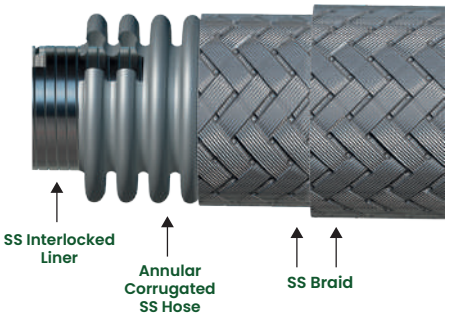


PH 2940 LINER

LINER



- The liner commonly serves in 2 purposes while still maintaing full working pressure of corrugated hose.
- The first is to protect the hose corrugations from excessive media velocities.
- The second purpose for a liner is abrasion resistance.

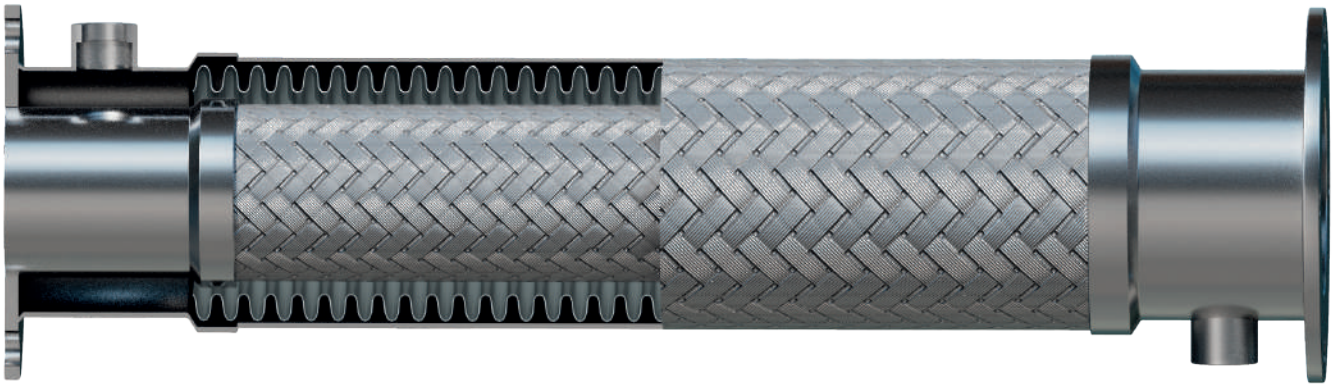


3.6 PH 2950 JACKETED HOSE

- Keep cryogenic liquids cold
- Increase flow of viscous media
- Safety containment

A Jacketed Hose Assembly is a hose within a hose. Both inner and outer hoses act independently as separate pressure carriers. Vacuum Jacketed Hose Assemblies are typically found in cryogenic applications because of their insulation properties. Steam Jacketed Hose Assemblies are utilized when the media is viscous and steam is used to help reduce viscosity and increase flow.

Commenly used in Bitumen& Asphalt application.



3.7 PH 2960 LANCE HOSE

- Large size range available
- Customized to meet critical application requirements
- Cleaned and capped for commercial oxygen service

Critical applications such as supplying commercial oxygen require expertise of an experienced metal hose manufacturer. Polyhose Tofle Oxygen Lance Hose is fabricated to meet this critical application when specified. Our fabrication department can customize the hose assembly, available in sizes through 16", to include a liner (to reduce turbulence resulting from high velocity), reinforced ends, casing or special end fittings. Each hose assembly is cleaned and capped for commercial oxygen service.

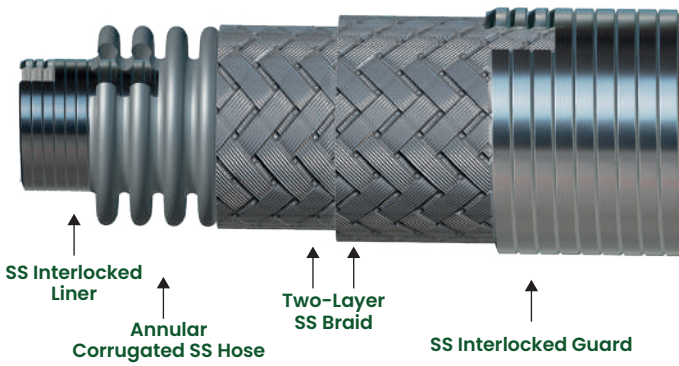
Types of Lance Hose Assemblies

1. Oxygen Lance Hose Assembly
2. Water Lance Hose Assembly

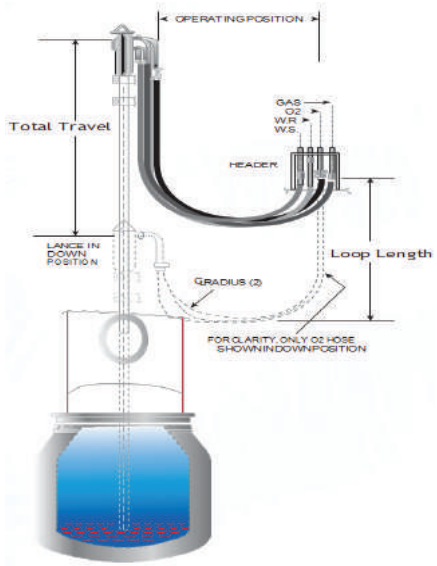
Available Size of Lance Hose Assemblies

1. 4" to 10"- Oxygen Lance Hose Assembly
2. 4" to 10"- Water Lance Hose Assembly

Construction

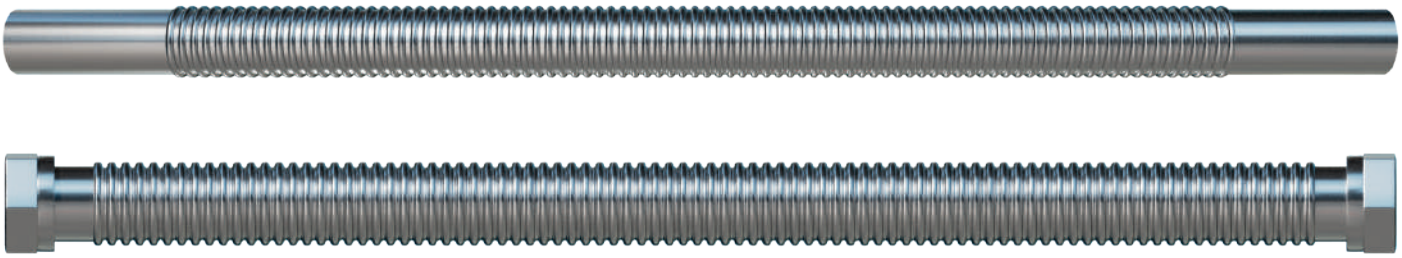


Oxygen Hose Installation



4.1 PH 3000 NON WELDED HOSE ASSEMBLY

Hose material : SS 304, SS 316L & SS 321
End fitting : Threaded Type (NPT, BSPT, BSPP)
EF material : CS & SS



SIZE	HOSE ID (INCH)	HOSE OD (INCH)	L (INCH)	*OAL (INCH)	WORKING PRESSURE @70°F, (PSI)
1/4"	0.25	0.38	2	39	200
5/16"	0.33	0.48	2	39	180
3/8"	0.39	0.56	2	39	100
1/2"	0.48	0.66	2	39	80
3/4"	0.80	1.05	2	39	70
1"	1.00	1.27	2	39	40

PART NO	SIZE	HOSE ID (MM)	HOSE OD (MM)	L (MM)	*OAL (M)	WORKING PRESSURE @20°C, (BAR)
PH 3000-006	1/4"	6.30	9.6	50	1	13.8
PH 3000-008	5/16"	8.50	12.10	50	1	12.4
PH 3000-010	3/8"	10.00	14.10	50	1	6.9
PH 3000-012	1/2"	12.10	16.70	50	1	5.5
PH 3000-020	3/4"	20.20	26.70	50	1	4.8
PH 3000-025	1"	25.30	32.30	50	1	2.8

Note: *Based on customer requirement

4.2 SOLAR HOSE

Solar hose is a corrugated metal tube made of stainless steel material covered with high temperature resistant EDPM insulation designed for connecting solar heating system.

PH 3011 Solar Hose Single

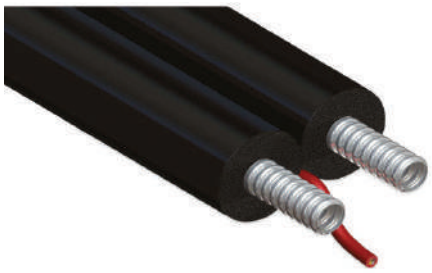
PH 3011 Solar hose is a corrugated metal tube with thickness 0.3 mm with UV protective EPDM insulation.

- Low cost & Easy installation.
- Type1: with sensor cable, Type2: Without sensor cable

Available size : DN 12, DN 16, DN 20 & DN 25
Steel thickness : 0.3 mm
Application : Heating System & Solar System
Material : SS 316L / SS 304

PART NO	SIZE	CONNECTION SIZE	SS THICK		*LENGTH	
			MM	INCH	M	FT
PH 3011-012	DN 12	1/2"	0.3	0.012	25	82
PH 3011C-012			0.3	0.012	50	164
PH 3011-016	DN 16	3/4"	0.3	0.012	25	82
PH 3011C-016			0.3	0.012	50	164
PH 3011-020	DN 20	1"	0.3	0.012	25	82
PH 3011C-020			0.3	0.012	50	164
PH 3011-025	DN 25	1.1/4"	0.3	0.012	25	82
PH 3011C-025			0.3	0.012	50	164

PH 3012 Solar Hose Twin



PH 3012 Solar hose is a corrugated metal tube with thickness 0.3 mm with UV Protective EPDM insulation.

- It can be easily separate.
- Available with or without sensor cable.
- Easy to bend & separate without using any additional tools.

Available size : DN 12, DN 16, DN 20 & DN 25
Steel thickness : 0.3 mm
Application : Heating System & Solar System
Material : SS 316L / SS 304

PART NO	SIZE	CONNECTION SIZE	SS THICK		*LENGTH	
			MM	INCH	M	FT
PH 3012-012	DN 12	1/2"	0.3	0.012	15	49.2
			0.3	0.012	25	82
			0.3	0.012	50	164
PH 3012-016	DN 16	3/4"	0.3	0.012	15	49.2
			0.3	0.012	25	82
			0.3	0.012	50	164
PH 3012-020	DN 20	1"	0.3	0.012	15	49.2
			0.3	0.012	25	82
			0.3	0.012	50	164
PH 3012-025	DN 25	1.1/4"	0.3	0.012	15	49.2
			0.3	0.012	25	82
			0.3	0.012	50	164

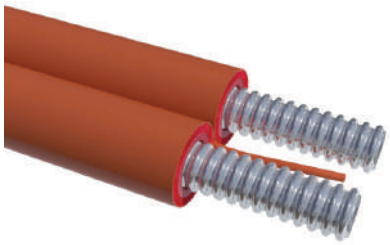
PH 3013 Solar Hose Red Sleeve Single

PH 3013 Solar hose is a corrugated metal with thickness of 0.3mm with red color low thickness thermal insulation in expanded polyurethane with or without UV protection.
Available type: Without Sensor cable

Available size : DN 16 & DN 20
Steel thickness : 0.3 mm
Application : High Working Temp
Material : SS 316L / SS 304

PART NO	SIZE	CONNECTION SIZE	SS THICK		*LENGTH	
			MM	INCH	M	FT
PH 3013-016	DN 16	3/4"	0.3	0.012	25	82
			0.3	0.012	50	164
			0.3	0.012	100	328
PH 3013-020	DN 20	1"	0.3	0.012	25	82
			0.3	0.012	50	164
			0.3	0.012	100	328

PH 3014 Solar Hose Red Sleeve Twin



PH 3014 Solar hose is a corrugated metal with thickness of 0.3 mm with red color low thickness thermal insulation in expanded polyurethane with or without UV protection.

PH3014 Solar hose is coupled and can be separated easily. This tube can be easily hand bent to make installation simpler & both inside, outside building.

Available size : DN 16 & DN 20
Steel thickness : 0.3 mm
Application : High Working Temp
Material : SS 316L / SS 304

PART NO	SIZE	CONNECTION SIZE	SS THICK		*LENGTH	
			MM	INCH	M	FT
PH 3014-016	DN 16	3/4"	0.3	0.012	25	82
			0.3	0.012	50	164
			0.3	0.012	100	328
PH 3014-020	DN 20	1"	0.3	0.012	25	82
			0.3	0.012	50	164
			0.3	0.012	100	328

Note: * Length can be modified as per customer requirement

4.3 PH 3020 BOILER HOSE

- Profile of the boiler hoses is similar to solar hose, but the wall thickness is higher.
- These hoses have a longer life at high pressure due to their high wall thickness.
- It is used in the manufacture of heat exchangers & boilers in solar water system.

Application:

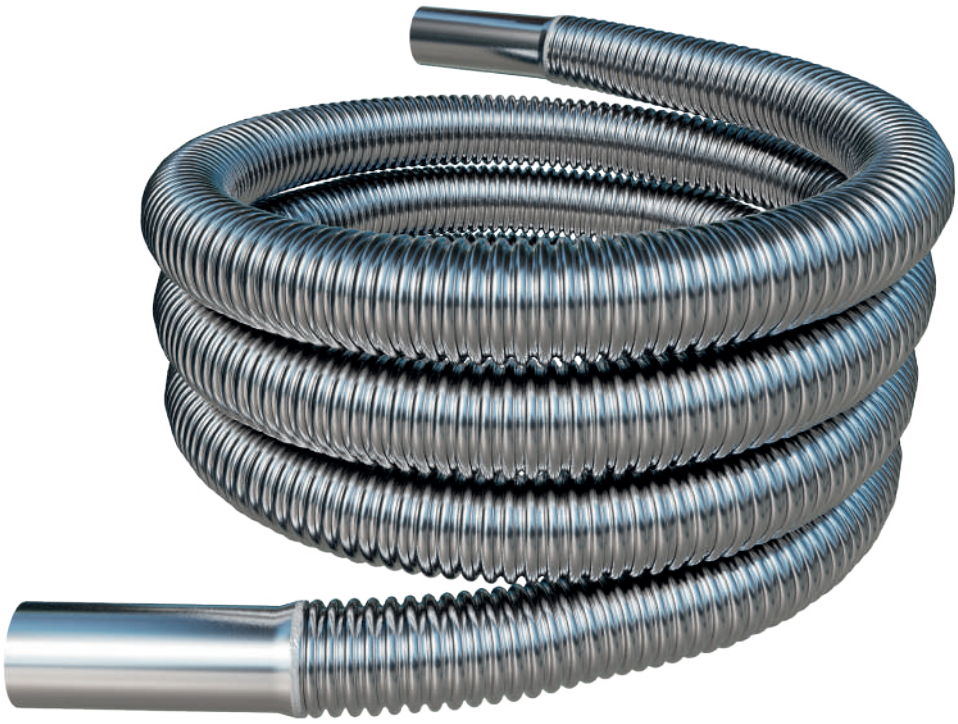
- Boiler system, Heat pump, Hot & Cold water pipelines.

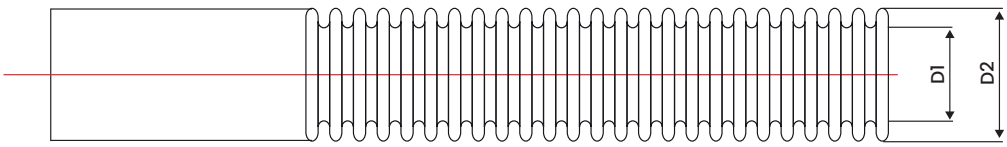
Advantages:

- Large surface area.
- High heat transfer efficiency.
- Can be supplied in single piece long length maximum 50 meters.
- Heating surface without calcification for heating.
- High acid and corrosion resistance with its stainless steel body.
- Can be installed easily on different boiler type with its flexible body.

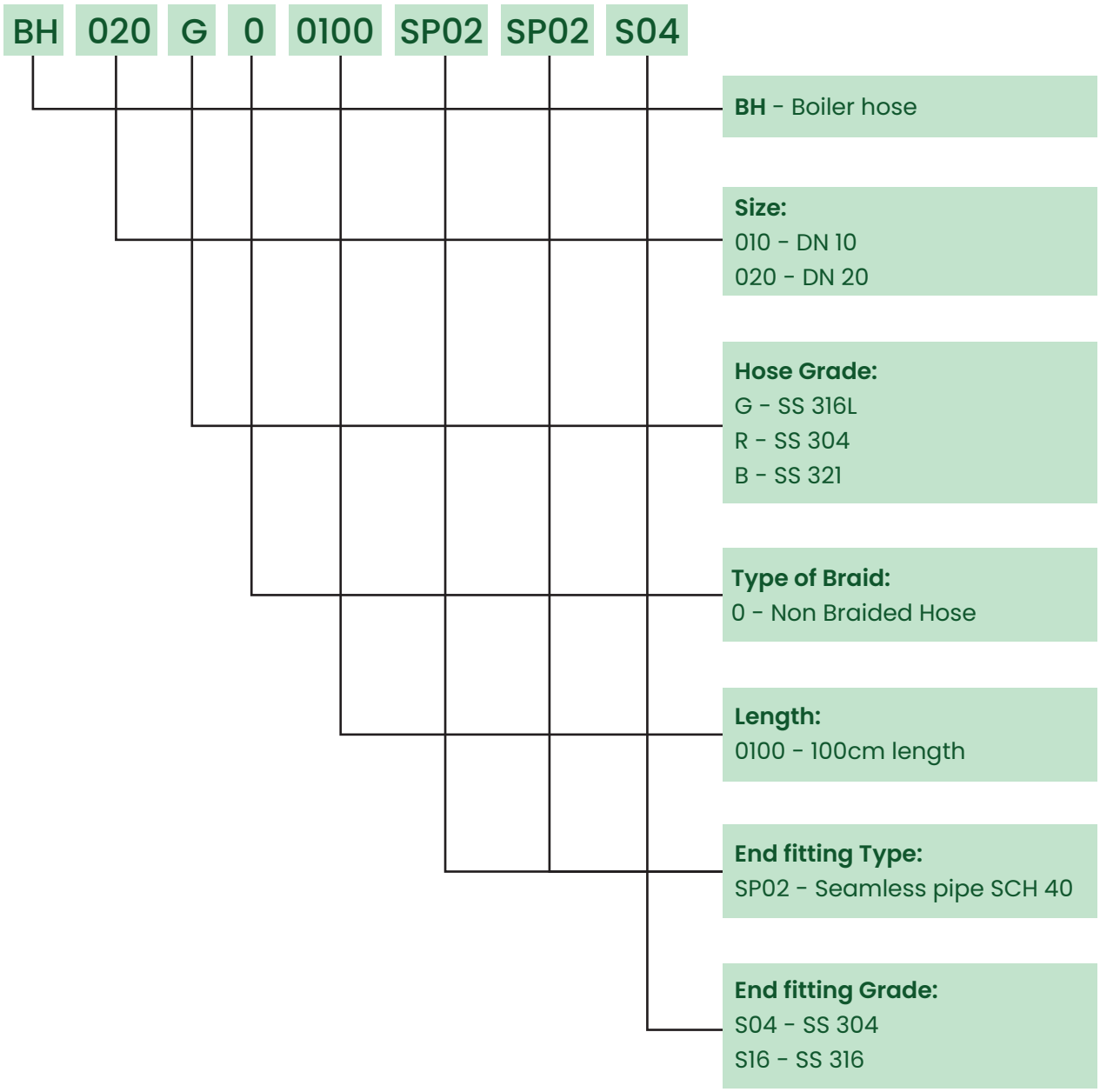
Design Values:

- Without braid
- Hose material - 316L
- Fitting material - 304, 316L
- Working pressure 0 - 10 barg
- Size: DN 20 - DN 40





PART NO	DN		TYPE	D1(ID)	D2(OD)	TOLERANCE	WORKING PRESSURE AT 20°C	SURFACE AREA	WEIGHT	LENGTH
	MM	INCH		MM	MM	MM	BARG	M^2/M	KG/M	M
PH 3020-020	20	3/4"	G020MFMX000T	20.2	26.7	±0.3	12	0.18	0.27	10-100
PH 3020-025	25	1"	G025MFMX000T	25.3	32.3	±0.4	10	0.23	0.36	10-100
PH 3020-032	32	1.1/4"	G032MFMX000T	33.6	41.2	±0.4	10	0.31	0.54	10-100
PH 3020-040	40	1.1/2"	G040MFMX000T	40	49.5	±0.4	10	0.36	0.70	10-100



Note: End fitting as per customer requirement.

5.1 ISO 10380 & TESTING

ISO

ISO or International Standards Organization was created to establish worldwide standards for industry. They are responsible for the formulation of standards regarding quality assurance of specific products. The ISO 10380 standard was developed to help define the industry requirements for design, manufacture and testing of corrugated metal hoses and hose assemblies. The following is a summary of the various sections covered in this standard.

Materials

ISO 10380 specification lists the more popular materials used in the manufacture of corrugated metal hoses, braids, ferrules, and end fittings. Two of the most common materials used for corrugated metal hoses are austenitic stainless steel and copper-based alloys.

The specification is very clear that the material used in manufacturing the corrugated metal hose shall be selected on the basis of their suitability for forming or welding and for the application conditions under which they will operate. Materials other than those listed above may be selected by agreement between the manufacturer and the user.

Critical Dimensions

Details and requirements specified in this section include hose diameter, bend radii and overall length tolerances. It is common for manufacturers to list their nominal hose diameter in published literature. ISO 10380 lists the requirement that the actual hose inside diameter will be at least 98% of the nominal hose size. The bend radius covered in the specification includes nominal static and nominal dynamic bend radius. Dynamic bend radius is used in cycle life fatigue testing. Overall length tolerances listed in the ISO 10380 are -1% to +3%.

Design

Pressure

The specification lists the maximum permissible pressure ratings to be used in testing performed in accordance with ISO 10380.

Elevated Temperatures

Pressure reduction for elevated temperature conditions is critical in applying the proper metal hose for an application. This specification provides for a method of determining the maximum service we pressure for a metal hose assembly under these conditions.

Low Temperatures

The materials listed in the specification, with the exception of carbon steel, do not need to be derated in low temperature applications down to -392°F or -200°C. Carbon steel material used for end fittings may be used to a minimum temperature of -68°F or -20°C.

Cycle Life

Corrugated metal hose bend radius and minimum acceptable cycle life design requirements are outlined. Values and test criteria for meeting static and dynamic bend radii are also listed.

Construction

Hose

Manufacturing and corrugation designs are addressed by the ISO 10380 specification. Seamless or longitudinally-welded tube may be corrugated into annular or helical corrugation designs. Details of methods for joining or segmenting metal hose are also listed.

Braid

ISO 10380 specifications are broad for the design of the braid.

Methods of Assembly

Many different methods of fitting attachment and unacceptable weld characteristics are outlined by the ISO 10380 specification. The use of protective covers is also addressed.

Testing

General Tests

Bend, fatigue, and burst test requirements are defined by ISO 10380. Polyhose Tofle performs each of these tests when designing or qualifying our products. The fatigue test is widely recognized in the metal hose industry as a standard for cycle life testing. While ISO 10380 lists the average number of cycles of 50,000 at their specified pressure ratings, Polyhose Tofle performs testing at our published maximum working pressure.

Production Tests

Several types of non-destructive testing are addressed by the specification. These include pressure proof test by hydraulic pressure or pneumatic pressure and leakage test by pneumatic or vacuum testing. Cleaning and marking of metal hose assemblies is outlined.

5.2 TESTING

1. Non-Destructive Testing: Evaluate the properties of a material, component, structure or system without causing any damage.

2. Destructive Testing: A test method conducted to find the exact point of failure of materials, components, or machines. During the process, the tested item undergoes stress that eventually deforms or destroys the material.

Non-Destructive Testing:

1. Dye Penetrant

Dye penetrant testing is available for both leak and weld bead inspection, in accordance with Polyhose Tofle procedures or to customer-specified standards.

2. Hydrostatic Testing

While the standard test is designed to detect leaks, hydrostatic testing is designed to test the assembly's strength. Testing of an assembly to its full permissible test pressure can be economically and accurately accomplished by filling the assembly with liquid while concurrently evacuating all air. The assembly is then hydrostatically pressurized using high pressure pumps and the test pressure is maintained for a predetermined period of time.

3. Pneumatic Test

Every corrugated hose assembly is leak tested prior to shipment. Standard testing consists of pressurizing the assembly with air and then submerging the entire assembly under water. This method is reliable and sufficient for the majority of applications.

Destructive Testing:

1. Burst Test

Normally, hydraulic pressure is slowly increased until failure occurs. Based on the burst test results, a safety factor is applied. This establishes the ultimate pressure rating.

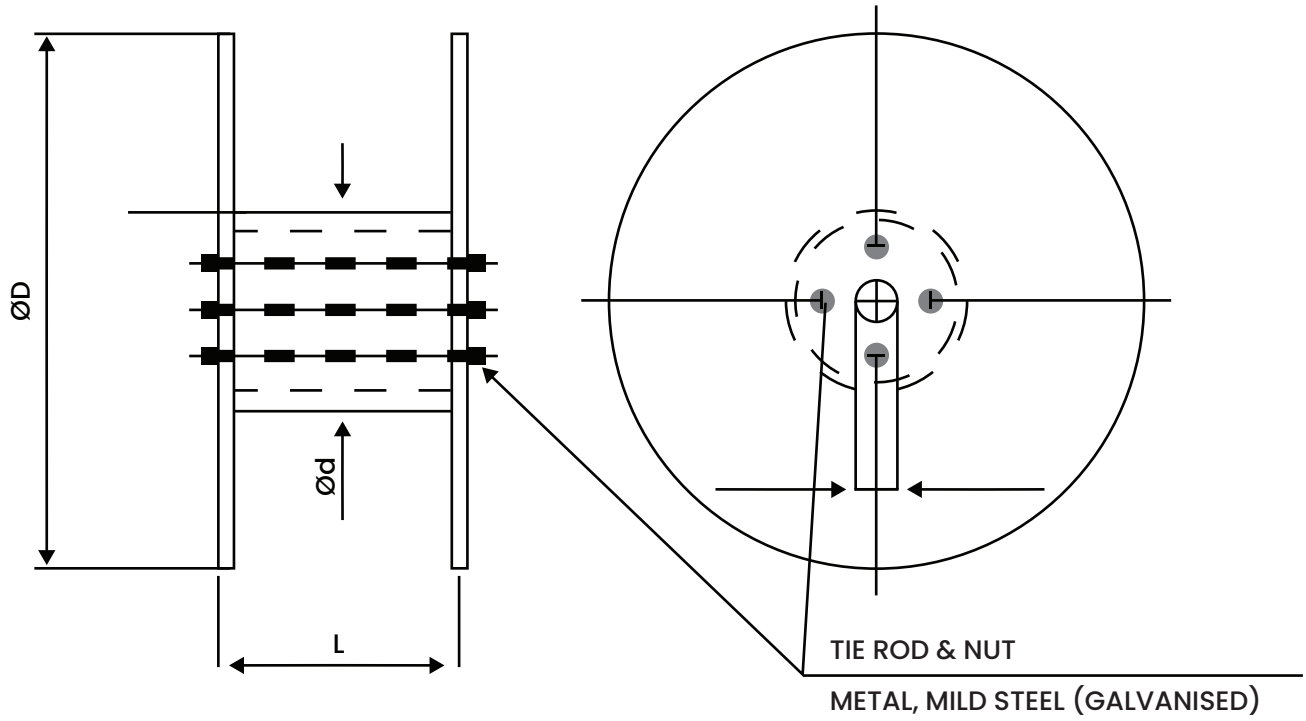
2. Cycle Test

Purpose: To find fatigue life of Braided Hose
Testing Frequency – As per ISO 10380
Sizes of Testing : DN 6 to DN 300

6 PHTO PACKING METHOD

- Bundles wrapped with bubble sheets.
- Bundles wrapped with PV Woven fabric.
- Only braids can be packed in boxes and loaded in container.
- Container loading for bulk hose will be planed according to ordered sizes.

PACKING METHOD-REEL TYPE



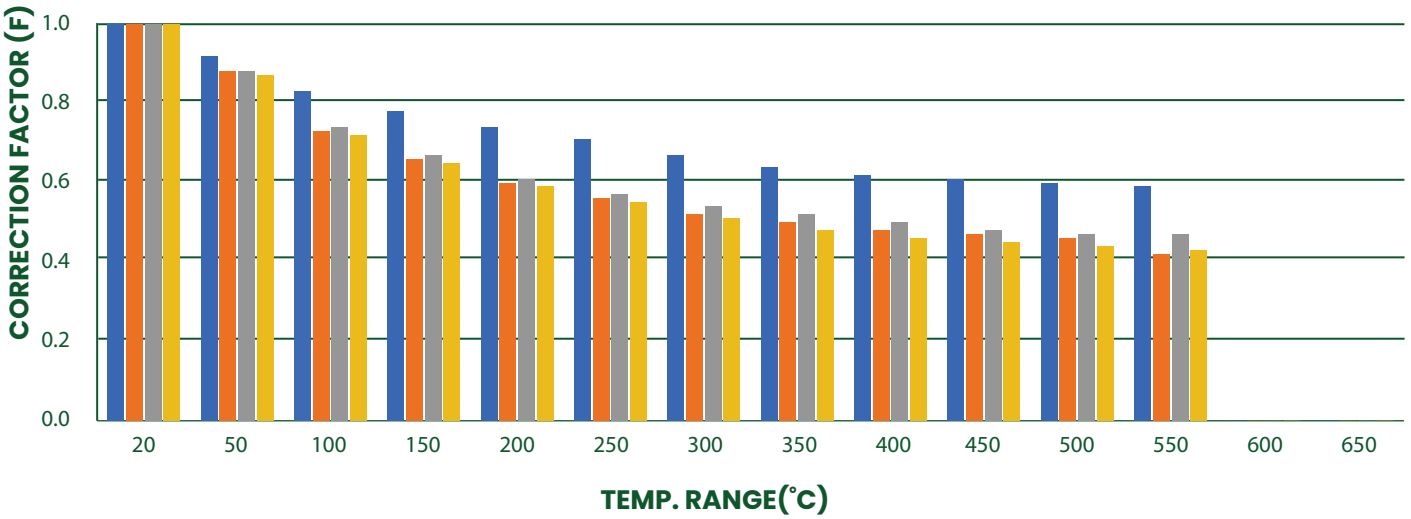
WOODEN REEL CAPACITY		
HOSE SIZE	DRUM TYPE	CAPACITY IN METER
1/4"	INC 1	300
	INC 2	1300
5/16"	INC 1	250
	INC 2	750
3/8"	INC 1	150
	INC 2	700
1/2"	INC 1	150
	INC 2	500
5/8"	INC 2	300
	INC 3	750
3/4"	INC 2	200
	MASTER	650
1"	INC 2	150
	MASTER	600
1.1/4"	INC 3	150
	MASTER	300
1.1/2"	INC 3	120
	MASTER	250
2"	INC 3	75
	MASTER	180

TYPE	ØD(INCH)	Ød(INCH)	L(INCH)
INC 1	21.7	10.43	13.8
INC 2	27.6	9.45	22
INC 3	39.4	13.78	22.4
MASTER	43.3	18.11	32.7

Note: Packing can be customised as per customer requirement.

7.1 TEMPERATURE CORRECTION FACTOR(F)

When hoses are required to work at higher temperatures, the working pressure given in the table should be multiplied by the correction factor. This will determine the pressure rating of the hoses for higher temperatures.



TEMP.RANGE(°C)	20	50	100	150	200	250	300	350	400	450	500	550	600	650
SS321	1	0.92	0.83	0.78	0.74	0.71	0.67	0.64	0.62	0.61	0.6	0.59	0	0
SS304	1	0.88	0.73	0.66	0.6	0.56	0.52	0.5	0.48	0.47	0.46	0.42	0	0
SS316L	1	0.88	0.74	0.67	0.61	0.57	0.54	0.52	0.5	0.48	0.47	0.47	0	0
SS304L	1	0.87	0.72	0.65	0.59	0.55	0.51	0.48	0.46	0.45	0.44	0.43	0	0

TEMP RANGE(°C)	1.4541	1.4301	1.4404	1.4306	CARBON STEEL
	SS 321	SS 304	SS 316L	SS 304L	
20	1	1	1	1	1
50	0.92	0.88	0.88	0.87	0.97
100	0.83	0.73	0.74	0.72	0.91
150	0.78	0.66	0.67	0.65	0.84
200	0.74	0.6	0.62	0.59	0.77
250	0.71	0.56	0.58	0.55	0.71
300	0.67	0.52	0.54	0.51	0.65
350	0.64	0.5	0.52	0.48	0.6
400	0.62	0.48	0.5	0.46	0.57
450	0.67	0.47	0.48	0.45	0.29
500	0.6	0.46	0.47	0.44	0.18
550	0.59	0.42	0.47	0.43	--
600	--	--	--	--	--
650	--	--	--	--	--

7.2 CORROSION RESISTANCE

	SS304L	SS316L	SS321
Acetic acid			
5 % to 20 % agitatdd or aerated	A	A	A
50 %, 20 °C	A	A	A
50 % to 80%, boiling	C	B	C
80%,20°C	A	A	A
100%,20°C	A	A	A
100 %, boiling	C	B	C
Acetic anhydride	A	A	A
Acetone, boiling	A	A	A
Acetyl chloride, boiling	B	B	B
Acetylene	A	A	A
Acid Salt Mixture	A	A	A
Air	A	A	A
Aluminium acetate, saturated	A	A	A
Aluminium hydroxide, saturated	A	A	A
Aluminium sulfate			
5%	A	A	A
10% ,20°C	A	A	A
10% ,boiling	B	A	B
Saturated, 20°C	A	A	A
Saturated, boiling	B	A	B
Aluminium potassium sulfate(alum)			
2% to 1%, 20°C	A	A	A
10% , boiling	B	A	B
Saturated	C	B	C
Amyl acetate, concentrate	A	A	A
Amyl chloride	A	A	A

	SS304L	SS316L	SS321
Ammonia (anhydrous)			
All concentrations	A	A	A
Hot Gas	C	C	C
Ammonium chloride			
1%	A	A	A
10%	A	A	A
28%	B	A	B
50%	B	A	B
Ammonium bromide	B	A	B
Ammonium bicarbonate, hot	A	A	A
Ammonium carbonate, 1%& 5%	A	A	A
Ammonia liquor			
20°C	A	A	A
Boiling	A	A	A
Ammonium monophosphate	A	A	A
Ammonium oxalate 5%	A	A	A
Ammonium perchlorate 10% boiling	A	A	A
Ammonium sulfite, 20° boiling	A	A	A
Aniline			
3%	A	A	A
Concentrated Crude	A	A	A
Argon (refrigerated liquid)	A	A	A
Barium carbonate	A	A	A
Barium chloride, 5% saturated	A	A	A
Barium hydroxide, acqeous solution, hot	A	A	A
Barium nitrate, Aqueous solution hot	A	A	A
Barium sulfate	A	A	A

	SS304L	SS316L	SS321
Barium sulfide, saturated solution	A	A	A
Benzene(Benzol) 20°C or hot	A	A	A
Benzoic Acid	A	A	A
Bitumen	A	A	A
Butane			
-50°C	A	A	A
20°C	A	A	A
Butyl Acid 5%	A	A	A
Auqeous solution, dilution of 0.964g/l	A	A	A
Calcium carbonate	A	A	A
Calcium chlorate, dilute solution	A	A	A
Calcium chlorite, dilute or concentrate solution	B	A	B
Calcium hypochlorite, 2%	B	A	B
Calcium hydroxide 10% to 20%	A	A	A
Calcium sulfate, saturated	A	A	A
Carbonated Water	A	A	A
Carbonic acid, saturated solution	A	A	A
Carbon dioxide			
Dry	A	A	A
Moist	A	A	A
Carbon disulfite	A	A	A
Carbon tetrachloride			
CP	A	A	A
Dry CP	A	A	A
Commercial +1% water	C	C	C
Cellulose	A	A	A
Chloracetic acid	C	C	C

Note: A-Recommended, B-Partially resist, C-Not Recommended

7.2 CORROSION RESISTANCE

	SS304L	SS316L	SS321
Chlorine Gas			
Dry	C	C	C
Moist	C	C	C
Chlorinated Water, saturated	A	A	A
Chloroform	A	A	A
Chromium (VI) Acid (Chromic Acid)			
5% CP	A	A	A
10%	C	B	C
Chromium plating bath	A	A	A
Chloroethane (Ethyl chloride)	A	A	A
Citric Acid			
5% still	A	A	A
15% still, 20°C	A	A	A
15% boiling	B	A	B
Copper (II) acetate, saturated solution	A	A	A
Copper (II) cyanide, saturated solution	A	A	A
Creosote (coal tar)	A	A	A
Creosote Oil	A	A	A
Cyanogen Gas	A	A	A
Developing Solution	A	A	A
Diethyl ether	A	A	A
Disodium tetraborate (Borax), 5%	A	A	A
Distillery Wort	A	A	A
Dyewood Liquor	A	A	A
Ethylene glycol	A	A	A
Ethanol (Ethyl Alcohol 20°C & boiling)	A	A	A
Ethyl acetate, concentrated solution	A	A	A
Ethylene chloride	A	A	A

	SS304L	SS316L	SS321
Oxalic Acid	C	C	C
5%, 10% 20°C	C	C	C
10% boiling	A	A	A
25%, 50% boiling	A	A	A
Paraffin Hot	C	B	C
Petrol	A	A	A
Petroleum Ether	A	A	A
Phenol			
Picric Acid	A	A	A
Potassium bromide	B	A	B
Pottasium hypochlorite	A	A	A
Potassium permanganate, 5%	C	C	C
Potassium sulfite (salt)	A	A	A
Propane	C	C	C
-50°C			
20°C	B	A	B
Pyrogallol (Pyrogallic Acid)	B	A	B
Quinine bisulfate, Dry			
Quinine sulfate, Dry	C	B	C
Resin			
Sea Water	B	A	B
Silver bromide	C	C	C
Silver nitrate	C	C	C
Soap			
Sodium acetate, moist	A	A	A
Sodium carbonate			
5%, 66°C	A	A	A
5%,50% boiling	A	A	A

	SS304L	SS316L	SS321
10%	A	A	A
Kerosene	A	A	A
Lactic Acid			
1%, 20°C	A	A	A
1%, boiling	A	A	A
5%, 20°C	A	A	A
5%, boiling	B	A	B
10%, 20°C	B	A	B
10%, boiling	C	B	C
Lead diacetate (Lead acetate) 5%	A	A	A
Linseed Oil	A	A	A
Magnesium chloride			
1% quiescent, 20°C	A	A	A
1% Quiescent, Hot	C	B	C
5% Quiescent, 20°C	A	A	A
5% Quiescent, Hot	C	B	C
Malic Acid	B	A	B
Mash	A	A	A
Mercury	A	A	A
Methane (refrigerated liquid)	A	A	A
Methanol (Methyl Alcohol) boiling	C	B	C
Mixed Acids, 53% H_2SO_4	A	A	A
Molasses	A	A	A
Mustard	A	A	A
Nephtha			
Crude	A	A	A
Pure	A	A	A
Naphthalene Sulfonic Acid	A	A	A

Note: A-Recommended, B-Partially resist, C-Not Recommended

7.2 CORROSION RESISTANCE

	SS304L	SS316L	SS321
Nickel chloride solution	A	A	A
Nickel sulfate	A	A	A
Nitre Cake	B	A	B
Nitric Acid			
5%, 50%, 70% boiling	A	A	A
65%, 20°C	A	A	A
65%, boiling	B	B	B
Concentrated, 20°C	A	A	A
Concentrated, boiling	C	C	C
Fuming concentrated, 43°C	A	A	A
Fuming concentrated, boiling	C	C	C
Nitrogen refrigerated liquid	A	A	A
Nitrous Acid, 5%	A	A	A
Oil, Crude	A	A	A
Oil vegetable, mineral	A	A	A
Oleic Acid	A	A	A
Orthoboric Acid			
5% Solution, 20°C	A	A	A
5% Solution, boiling	A	A	A
Saturated solution, 20°C	A	A	A
Saturated solution, boiling	A	A	A
Orthophosphoric Acid			
1%, 20°C	A	A	A
1%, boiling	A	A	A
1% 3, 1bar, 140°C	A	A	A
5% Quiescent or agitated	A	A	A
5% Aerated	A	A	A
10% Quiescent	C	A	C

	SS304L	SS316L	SS321
10% Agitated or aerated	C	B	C
10%, 50% boiling	A	A	A
80%, 20°C	C	C	C
80%, 110°C	C	C	C
85%, boiling	C	C	C
Oxalic Acid			
5%, 10% 20°C	A	A	A
10%, boiling	C	C	C
25%, 50% boiling	C	C	C
Oxygen (refrigerated liquid)	A	A	A
Paraffin Hot	A	A	A
Petrol	A	A	A
Petroleum Ether	A	A	A
Phenol	A	A	A
Picric Acid	A	A	A
Potassium bromide	B	A	B
Potassium carbonate			
1% 20°C	A	A	A
Hot	A	A	A
Potassium chlorate saturated at 100°C	A	A	A
Potassium chlorate			
1%, Quiescent	A	A	A
1%, Agitated or aerated	A	A	A
5%, Quiescent	A	A	A
5%, Agitated or aerated	A	A	A
5%, boiling	A	A	A
Potassium chromium sulfate			
5%	A	A	A

	SS304L	SS316L	SS321
Dilution of 1.6g/l	C	C	C
Potassium cyanide	A	A	A
Potassium dichromate			
Potassium bichromate			
25%, 20°C	A	A	A
25%, boiling	A	A	A
Potassium hexacyanoferrate(III)			
5%, 25%, 20°C	A	A	A
25%, boiling	A	A	A
Potassium hexacyanoferrate(II)			
5%	A	A	A
Potassium hydrogen oxalate			
5%	A	A	A
27%	A	A	A
50%	B	A	B
Pottasium hypochlorite	B	B	B
Pottasium nitrate			
1%,5% still or agitated	A	A	A
1%,5% Aerated	A	A	A
50%, 20°C	A	A	A
50%, boiling	A	A	A
Molten	A	A	A
Potassium permanganate, 5%	A	A	A
Potassium sulfate			
1%, 5% still or agitated	A	A	A
1%, 5% Aerated, 20°C	A	A	A
Hot	A	A	A
Potassium sulfite (salt)	A	A	A

Note: A-Recommended, B-Partially resist, C-Not Recommended

7.2 CORROSION RESISTANCE

	SS304L	SS316L	SS321
Propane			
-50°C	A	A	A
20°C	A	A	A
Pyrogallol (Pyrogallic Acid)	A	A	A
Quinine bisulfate, Dry	B	A	B
Quinine sulfate, Dry	A	A	A
Resin	A	A	A
Sea Water	B	C	B
Silver bromide	B	A	B
Silver nitrate	A	A	A
Soap	A	A	A
Sodium acetate, Moist	A	A	A
Sodium carbonate			
5%, 66°C	A	A	A
5%,50% boiling	A	A	A
Molten	C	C	C
Sodium chloride			
5% still	A	A	A
20% aerated	A	A	A
Saturated, 20°C	A	A	A
Saturated, boiling	B	A	B
Sodium cyanide	A	A	A
Sodium fluoride, 5% solution	B	A	B
Sodium bicarbonate			
All Concentrations, 20°C	A	A	A
5% still, 66°C	A	A	A
Sodium hydrogen sulfate			
Solution	A	A	A

	SS304L	SS316L	SS321
Saturated solution	C	C	C
Sodium hydroxide	A	A	A
Sodium hypochlorite	C	C	C
Sodium nitrate	A	A	A
Sodium perchlorate, 10%	A	A	A
Sodium phosphate	A	A	A
Sodium sulfate			
5% still	A	A	A
All concentrations	A	A	A
Disodium sulfate, saturated	B	A	B
Sodium sulfite			
5%	A	A	A
10%	A	A	A
Sodium thiosulfate			
Saturated solution	A	A	A
Acid mixing bath(hypo)	A	A	A
25% solution	A	A	A
Sodium thiosulfite			
Steam	A	A	A
Stearic Acid	A	A	A
Strontium hydroxide	A	A	A
Strontium nitrate solution	A	A	A
Sulfur			
Moist	B	A	B
Molten	A	A	A
Sulfur chloride, Dry	C	C	C
Sulfur dioxide, Gas			
Moist	B	A	B

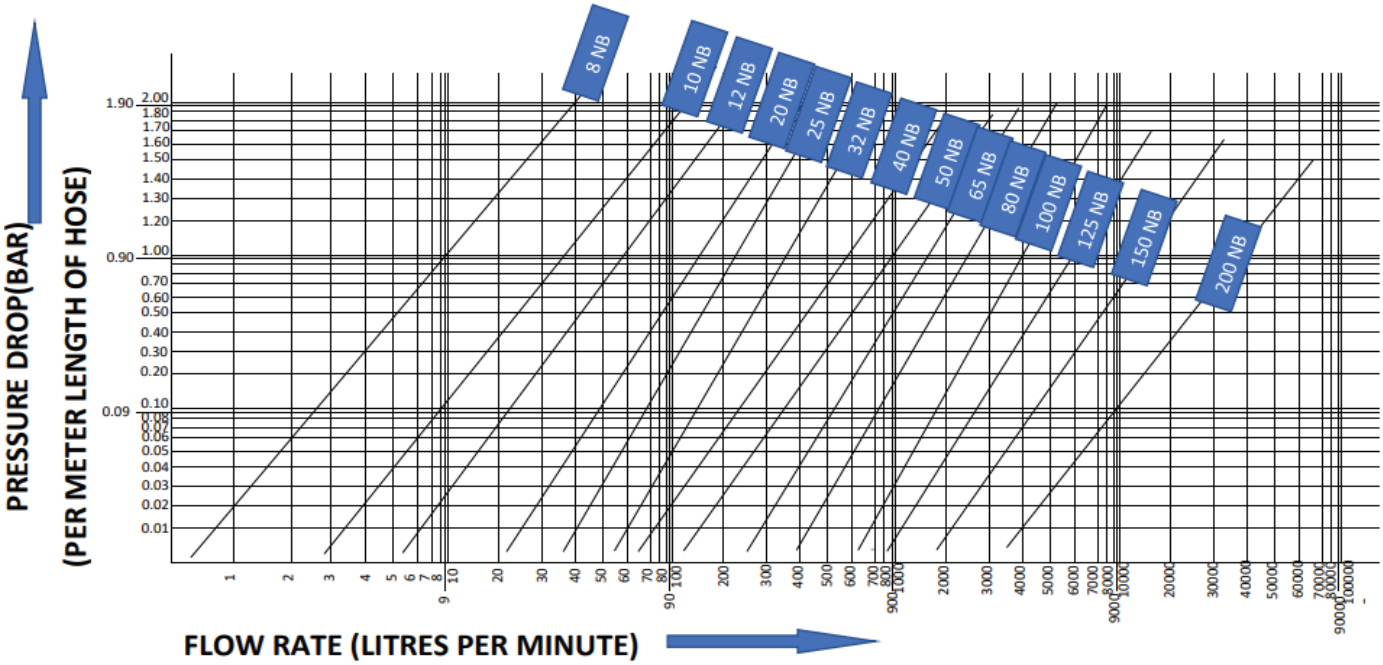
	SS304L	SS316L	SS321
Dry	A	A	A
Sulfuric Acid			
5%,10%	C	B	C
50%	C	C	C
Tannic Acid			
20°C	A	A	A
66°C	A	A	A
Tanning Liquor	A	A	A
Tar	A	A	A
Trichloroacetic Acid	C	C	C
Trichloroethylene			
Dry	A	A	A
Moist	C	C	C
Trichloroacetic Acid	C	C	C
Varnish	A	A	A
Vegetable juice	A	A	A
Vinegar fumes	B	A	B
Vinegar, still agitated or aerated	A	A	A
Water, potable	A	A	A
Whisky	A	A	A
Wine, all phases of processing & storing	A	A	A
Yeast	A	A	A
Zinc chloride			
5% still	A	A	A
20°C boiling	B	B	B
Zinc cyanide, Moist	A	A	A
Zinc nitrate, solution	A	A	A
Zinc sulfate, 4%	A	A	A

Note: A-Recommended, B-Partially resist, C-Not Recommended

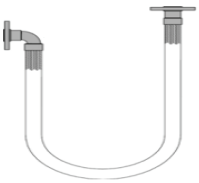
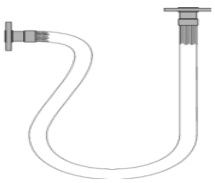
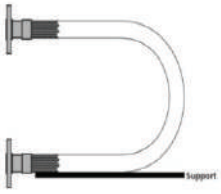
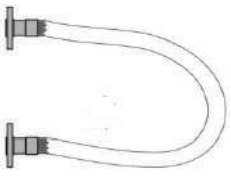
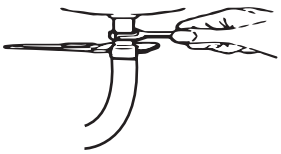
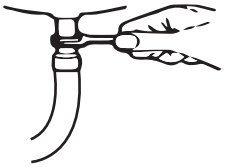
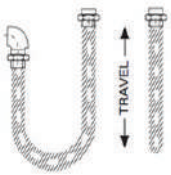
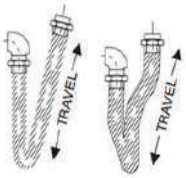
7.3 PRESSURE DROP CHART

Pressure drop mainly depends on temperatures, surface conditions, and hose configurations. Commonly, when the temperature rises, pressure drop will increase.

Chart Indicating the Approximate Pressure Drop Per Meter Length in Corrugated Hose Corresponding to Flow Rate of Water in Litres Per Minute



7.4 INSTALLATION CONDITION

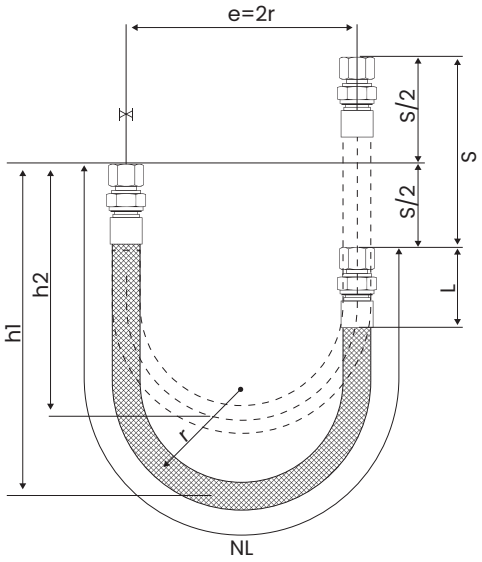
	Do	Don't
Maintain Bend Radius		
Provide Support		
Use Double Wrench Avoid Twisting		
Not Allow Hose Movement in Multiple Direction		

7.5 NOMINAL LENGTH OF HOSE

1. Vertically 180° Bend & Vertical Movement

NL-4r +(S/2)+ 2L

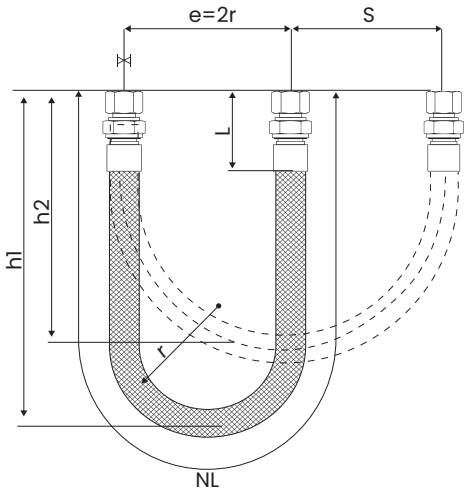
Here
r-Bending radius-mm
e-installation distance-mm
l-length of the connection fitting-mm
h1-max.height of 180°bend
h2-min.height of 180°bend
s-elevation-mm
NL-nominal length-mm



2. Vertically 180° Bend & Horizontal Movement

NL=4r+ 1.57 s+ 2L

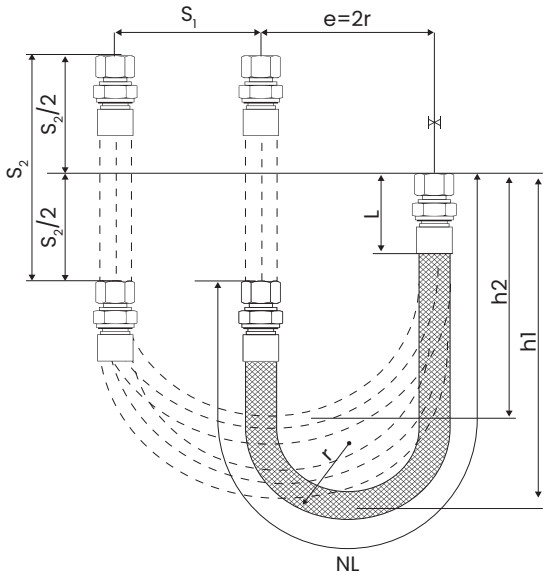
Here
r-Bending radius-mm
e-installation distance-mm
l-length of the connection fitting-mm
h1-max.height of 180°bend
h2-min.height of 180°bend
s-elevation-mm
NL-nominal length-mm



3. Horizontally 180° Bend & Horizontal Movement

NL=4r +1.57 S_1 +(S_2/2) +2L

Here
r-Bending radius-mm
e-installation distance-mm
l-length of the connection fitting-mm
h1-max.height of 180°bend
h2-min.height of 180°bend
s-elevation-mm
NL-nominal length-mm



7.6 FLOW VELOCITY

When to use Liners Liquid or Gas applications conveying media at high velocity should use an interlock liner in the hose assembly. This liner will decrease the turbulence caused by the high velocity and reduce the vibration that will occur. A liner is recommended if the velocity is greater than the following:

Conversion Formulas

DEFINITIONS	FEET PER SECOND (FT./SEC.)
gph: gallons per hour	(gph ÷ ID2) x 0.0068
gpm: gallons per minute	(gpm ÷ ID2) x 0.4083
cfh: cubic feet per hour	(cfh ÷ ID2) x 0.0509
cfm: cubic feet per minute	(cfm ÷ ID2) x 3.0558
cfs: cubic feet per second	(cfs ÷ ID2) x 183.35

MEDIA	HOSE ALIGNMENT	MAXIMUM VELOCITY NO LINER (FT./SEC.)
Liquid	Straight	70
Liquid	45° bend	55
Liquid	90° bend	35
Gas	Straight	140
Gas	45° bend	110
Gas	90° bend	70

7.7 LIVE HOSE LENGTH BENDING TABLE

Determine the centerline bend radius required for your application.

- Under the column headed "Centerline Bend Radius in Inches," find your radius and read horizontally to the desired degree of bend (45°, 90°, or 180°).
- The number in that column will be the minimum live length required to make that degree of bend along the desired centerline radius.

CENTERLINE BEND RADIUS IN INCHES	MINIMUM LIVE LENGTH		
	45°	90°	180°
1	1	2	4
2	2	3.1/2	7
3	2.1/2	5	10
4	3.1/2	6.1/2	13
5	4	8	16
6	5	10	20
7	5.1/2	11	22
8	6.1/2	13	26
9	7.1/2	14.1/2	29
10	8	16	32
11	9	18	36
12	10	19 1/2	39
13	10 1/2	21	42
14	11 1/2	22 1/2	45
15	12	24	48
16	13	26	52
17	13 1/2	27	54
18	14 1/2	29	58

CENTERLINE BEND RADIUS IN INCHES	MINIMUM LIVE LENGTH		
	45°	90°	180°
19	15 1/2	30 1/2	61
20	16	32	64
25	20	40	80
30	24	48	95
34	27	54	108
50	40	80	160
55	45	90	180
60	49	97	194
65	53	105	210
70	56	112	224
80	65	130	260
90	73	145	290
100	80	160	320
120	95	190	380
140	112	225	450
160	128	255	510
180	143	285	570
200	160	320	640

Note:

1. Based on hose size, bend radius may vary.
2. Add fitting and braid sleeve length to each end of hose for overall length.

8 TERMINOLOGY

Abrasion
External damage to a hose assembly caused by it being rubbed on a foreign object.

Ambient or Atmospheric Conditions
The surrounding conditions, such as temperature, pressure and corrosion, to which a hose assembly is exposed.

Angular Deflection
The displacement that occurs when an assembly is bent into a single curve, expressed as an angle.

Anchor
A restraint applied to a pipeline to control its motion caused by thermal growth.

Annular
Refers to the convolutions on a hose that are a series of complete circles or rings located at right angles to the longitudinal axis of the hose (sometimes referred to as "bellows").

Application
The service conditions that determine how a metal hose assembly will be used.

Armor Guard Or Casing
Flexible interlocked or squarelocked tubing placed over the entire length of a hose or in short lengths at the end of a metal hose, to protect it from physical damage and to limit the bending radius.

Attachment
The method of fixing end fittings to flexible metal hose–welding, brazing, soldering, swaging or mechanical.

Axial Movement
Compression or elongation of the hose along its longitudinal axis.

Basket Weave
A braid pattern in which the strands of wire alternately cross over and under two braid bands (two over – two under).

Beamed Braid
Braid construction where the strands of wire in each carrier are parallel.

Bend Radius
The radius of a bend measured to the hose centerline.

Braid
A flexible wire sheath surrounding a metal hose that prevents the hose from elongation due to internal pressure. Braid is composed of a number of wires wrapped helically around the hose while at the same time going under and over each other in a basket weave fashion.

Braid Angle
The acute angle formed by the braid strands and the axis of the hose.

Braid Sleeve, Braid Band or Ferrule
A ring made from tube or metal strip placed over the ends of a braided hose to contain the braid wires for attachment of fittings.

Braid Wear
Motion between the braid and corrugated hose which normally causes wear on the outside diameter of the corrugation and the inside diameter of the braid.

Braided Braid
In this braid, the strands of wire on each carrier of the braiding machine are braided together, and then braided in normal fashion. Hence the term braided braid.

Brazing
A process of joining metals using a non-ferrous filler metal with a melting point that is lower than the "parent metals" to be joined.

Butt Weld
A process in which the edges or ends of metal sections are butted together and joined by welding.

Controlled Flexing
Controlled flexing occurs when the hose is being flexed regularly, as in connections to moving components.
Examples:
Platen presses, thermal growth in pipe work.

Convolution/Corrugation
The annular or helical flexing member in corrugated or stripwound hose.

Corrosion
The chemical or electro-chemical attack of a media upon a hose assembly.

Cycle Life
The number of cycles completed by an assembly before failure.

Cycle-Motion
The movement from normal to extreme position and return.

Developed Length/Overall Length
The length of a hose, plus fittings required to meet the conditions of a specific application.

Diamond Weave
A braid pattern in which the strands alternately cross over one and under one of the strands (one over – one under). Also known as plain weave.

Dye Penetrant Inspection or Test
A method for detecting surface irregularities, such as cracks, voids, porosity, etc. The surface to be checked is coated with a red dye that will penetrate existing defects.

Dye is removed from surface and a white developer is applied. If there is a defect in the surface being checked, the red dye remaining in it causes the white developer to be stained, thereby locating the defective area.

Displacement
The amount of motion applied to a hose defined as inches for parallel offset and degrees for radial misalignment.

Erosion
The wearing away of the inside or outside convolutions of a hose caused by the flow of the media conveyed, such as wet steam, abrasive particles, etc.

Exposed Length
The amount of active (exposed) hose in an assembly. Does not include the length of fittings and ferrules.

Fatigue
Failure of the metal structure associated with, or due to, the flexing of metal hose or bellows.

Fitting/Coupling
A loose term applied to the nipple, flange, union, etc., attached to the end of a metal hose.

Flow Rate
Pertains to a volume of media being conveyed in a given time period. E.g., cubic feet per hour, pounds per second, gallons per minute, etc.

Frequency
The rate of vibration or flexure of a hose in a given time period. E.g., cycles per second (CPS), cycles per minute (CPM), cycles per day (CPD), etc.

Helical
Used to describe a type of corrugated hose having one continuous convolution resembling a screw thread.

Helical Wire Armor/Spring Guard
To provide additional protection against abrasion. Metal hoses can be supplied with an external round or oval section wire spiral.

Inside Diameter (I.D.)
The diameter inside the hose corrugation.

Interlocked/Squarelocked Hose
Formed from profiled strip and wound into flexible metal tubing with no subsequent welding, brazing, or soldering. May be made pressure-tight by winding in strands of packing.

Lap Weld (LW)
Type of weld in which the ends or edges of the metal overlap each other and are welded together.

Lateral Offset
The perpendicular distance between parallel fitting axes of an assembly.

Liner
Flexible sleeve used to line the inside diameter of the hose when conveying a high-velocity media, also prevents erosion.

Live Length
The amount of active (flexible) length of hose in an assembly. Does not include the length of fittings and ferrules.

Loop Installation
The assembly is installed in a loop or "U" shape and is most often used when frequent and/or large amounts of motion are involved.

Medium, Media
The substance(s) being conveyed through a system.

Nominal Diameter
Indicates the approximate inside diameter.

Offset-Lateral, Parallel
The distance that the ends of a hose assembly are displaced in relation to each other as a result of connecting two misaligned terminations in a system, or intermittent flexure required in a hose application.

Operating Conditions
The pressure, temperature, motion, and environment to which a hose assembly is subjected.

Outside Diameter (O.D.)
The external diameter of a metal hose, measured at the top of the corrugation or braiding.

Percent of Braid Coverage
The percent of the surface area of a hose that is covered by braid.

Pitch
The distance between the two peaks of adjacent corrugations or convolutions.

Ply, Plies
The number of individual thicknesses of metal used in the construction of a wall of the convoluted hose.

Pressure
Usually expressed in pounds per square inch (psi).

Pressure, Burst
Failure of the hose where the braid fails in tensile, or the hose ruptures, or both, due to the internal pressure applied.

Pressure, Deformation
The pressure at which the convolutions of a hose become permanently deformed.

Pressure, Maximum Allowable Working
The maximum pressure at which a hose or hose assembly is designed to be used.

Pressure, Pulsating
A rapid change in pressure above and below the normal base pressure, usually associated with reciprocating type pumps. This pulsating pressure can cause excessive wear between the braid and the tops of the hose convolutions.

Pressure, Shock
A sudden increase of pressure in a hydraulic or pneumatic system which produces a shock wave. This shock can cause severe permanent deformation of the hose corrugations, as well as rapid failure due to metal fatigue.

Pressure, Static
A non-changing, constant pressure.

Pressure, Working
The pressure, usually internal but sometimes external, imposed on a hose during operating conditions.

Safety Factor
The relationship of working pressure to burst pressure.

Strand(S)
Individual groups of wires in a braid. Each group is supplied from a separate carrier in the braiding machine.

Stress Corrosion
A form of corrosion in stainless steel normally associated with chlorides.

TIG Weld/GTAW
The gas tungsten arc welding process sometimes referred to as a "shielded arc" or "heliarc."

Traveling Loop
A general classification of bending wherein the hose is installed in a U-shaped configuration.

Traveling Loop, Class A Loop
An application wherein the radius remains constant and one end of the hose moves parallel to the other end.

Traveling Loop, Class B Loop
A condition wherein a hose is installed in a U-shaped configuration and the ends move perpendicular to each other so as to enlarge or decrease the width of the loop.

Torque (Torsion)
A force that produces, or tends to produce, rotation of or torsion about the longitudinal axis of a hose assembly while the other end is fixed.

Vacuum
Negative pressure or suction.

Velocity
The speed at which the medium flows through the hose.

Velocity Resonance
The vibration of convolutions due to the buffeting of a high velocity gas or liquid flow.

Vibration
Low-amplitude motion occurring at high frequency.

Welding
The process of localized joining of two or more metallic components by means of heating their surfaces to a state of fusion, or by fusion with the use of additional filler material.

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