Quality Foils (India) Ltd.
(Flexible Hose Division)

QUALITY GROUP

World Class Stainless Steel Corrugated Flexible HOSES & HOSE ASSEMBLIES

The Quality Group

The Quality Group is a leading manufacturer of Stainless Steel Precision Strips / Coils, Welded / Seamless Pipes and SS Corrugated Flexible Hoses & Hose Assemblies in India. Our fully integrated plant located in Hisar (Haryana), India, is equipped with most modern manufacturing facilities supported by marketing offices spread across Delhi, Pune, Mumbai and further representations in Europe.

The Flagship company, **Quality Foils (India) Ltd., an ISO 9001:2008 certified unit**, is a pioneer and established unit for more than 2 decades.

Our Group companies ability to meet the demanding requirements for high quality standards and faster turn-around time has gained our products favourable acceptance among leading OEM engineering companies for their critical and special applications.

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With the brand name **"QUALITY FLEXIBLESTM "** a business unit of Quality Group, is set up to facilitate our forward integration drive to manufacture full range of Stainless Steel Corrugated Flexible Hoses & Hose Assemblies (1/4" to 10") in AISI 304, 321 & 316L grade conforming to international quality standards.

Our Stainless Steel Corrugated Flexible Hoses conform to BS:6501 part-1 2004 and IS:10380 Standard.

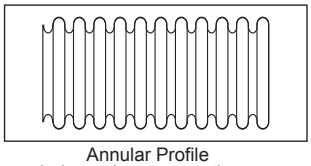
Our Product Range

HOSE

In modern industrial piping Flexible Metal Hoses are extensively used for good flexibility, corrosion resistance, fatigue resistance, high and low temperature resistance (-200°C to +650°C), high pressure resistance and long service life.

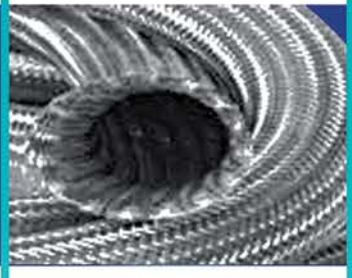
We offer Stainless steel corrugated flexible hoses & hose assemblies from 6mm (1/4") to 250 mm (10"). The annular corrugated hose body provides the flexibility and pressure tight core of the assembly.

We also manufacture highly flexible close-pitch hose for Special Applications.



Annular Profile
Independent corrugations, straight and parallel

BRAID



Unbraided corrugated hoses tend to elongate when pressurized above a certain level. To restrain this, an external layer of stainless steel wire braiding is provided on the hose. Braiding prevents longitudinal expansion of corrugated hose and thus increases the internal pressure strengthen the hose many fold. Braiding is highly flexible and exactly follows the movements of the hose.

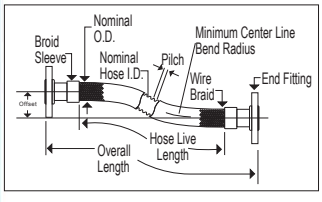
To increase the pressure ratings further, two or even three layers of braiding are provided. Unless specified, braiding is normally manufactured in high tensile stainless steel AISI 304 wire, or stainless steel AISI 316.

In case of bulk requirement, we also manufacture Braids as per client's requirements.

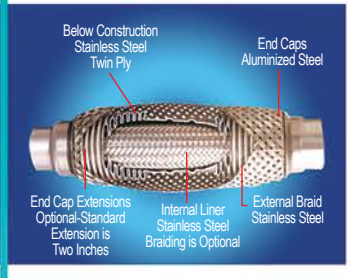
ASSEMBLIES & END CONNECTIONS

A hose assembly consists of a metal hose, with or without braid, with fittings, designed, manufactured and tested.

QUALITY FLEXIBLES™ can design and manufacture almost any kind of hose assembly,either from our standard program or customer's specification.



FLEXIBLE EXHAUST CONNECTORS



Our thin wall, flexible connector design offers an excellent characteristic of vibration and durability . Multi-ply construction available in all materials with diverse selection of material options, including special alloys for corrosion and temperature resistance. Flexibility vs. Stiffness can be customized as needed.

Advantages of Flexible Metal Hoses

* Suitable for wide temperature range (-200°C to +650°C)
* Compensates for thermal expansion contraction in the piping system
* High physical strength combined with light weight
* Fire resistant
* Moisture resistant
* Longer life
* Good corrosion resistance characteristics
* Resistant to abrasion, penetration and damage
* Connects misaligned rigid piping absorbs or dampens vibration.
* A flexible and quick option for rigid piping in difficult locations.

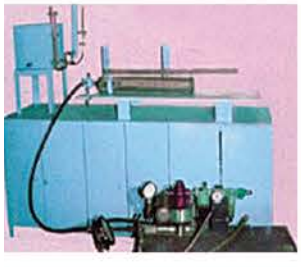
Quality and R&D

Every stage of our production process is constantly monitored by qualified QC engineers.
QUALIT Y FLEXIBLESTM has complete in-house laboratory, as per international standards specified for metallic flexible hoses, and testing facilities.

Every single hose assembly is tested hydraulically at 1.5 times working pressure before dispatch. Pneumatic testing is also carried out whenever necessary. All raw material used in the manufacture of Hoses, Braiding and End Connections undergo rigid inspection to ensure highest quality standards.

KIND OF TESTS:

1. Flex Fatigue or Cycle Life Test
2. Burst Pressure or Yield Test
3. Bend Radius Test
4. Flame Test



Yield Test

Flex Fatigue Test

Applications

* Refineries
* Steel Plants
* Power Plants
* Nuclear Installations
* Fertilizer Industry
* Cryogenic Service
* Pharmaceutical Industry
* Paper Plants
* Chemical Industry
* Lubrication Systems
* Automotive Industry
* Defence Industry
* Steam, Hot Water, Pneumatic Service
* Boilers
* Vacuum Systems
* Piping
* Air Conditioning & Refrigeration
* Ports and Ship Yards
* Vibration Absorption
* Railways

Technical Data
for Braided Hoses & Assemblies

NOMINAL BORE	MINIMUM BEND RADIUS		SINGLE BRAID		DOUBLE BRAID	
N.B.	STATIC	FLEXING	Max. working pressure	Test pressure	Max. working pressure	Test pressure
mm	mm	mm	kg/cm2	kg/cm2	kg/cm2	kg/cm2
6	25	100	100	150	160	240
10	40	150	90	135	144	216
12	50	200	80	120	128	192
16	50	200	70	105	112	168
20	70	200	64	96	102	153
25	90	200	50	75	80	120
32	110	250	40	60	64	96
40	130	250	30	45	48	72
50	175	350	28	42	44	66
65	200	410	24	36	38	57
80	205	450	18	27	28	42
100	230	560	16	24	26	39
125	280	660	12	18	20	30
150	320	815	10	15	16	24
200	435	1015	08	12	12	18
250	560	1220	06	09	10	15

Note:

1. The above technical details are subject to change without notice
2. The above value applies only to braided hose and assemblies at an ambient temperature of 20 °C·
3. The burst pressure is 4 times the Max .Working pressure.

Temperature Correction Factor

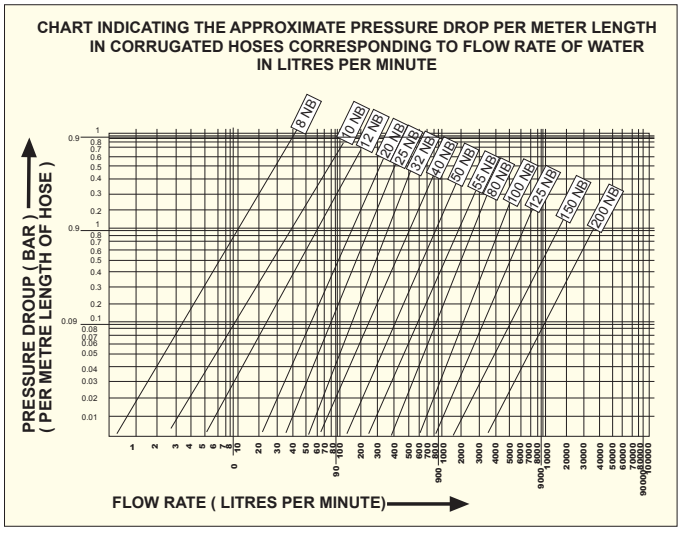
When hoses are required to work at higher temperatures, the working pressure given in **Table-1** should be multiplied by the correction factor. This will determine the Pressure rating of the hoses for higher temperature.

(Table-1)

Temperature Range		Correction Factor "f"		
°C	°F	1.4541 (SS321)	Materials 1.4404 &1.4306 (SS316L & SS304L)	Carbon Steel
>-200≤-20	>-328≤ -4	1	1	-
>-20≤50	>-4≤122	1	1	1
>50≤100	>122≤212	0-96	0.94	0.91
>100≤150	>212≤302	0.92	0.90	0.83
>150≤200	>302≤392	0.88	0.86	0.74
>200≤250	>392≤482	0.84	0.82	0.66
>250≤300	>482≤572	0.80	0.78	0.59
>300≤350	>572≤662	0.76	0.74	0.54
>350≤400	>662≤752	0.72	0.70	0.52
>400≤450	>752≤842	0.66	0.66	-
>450≤500	>842≤932	0.60	0.60	-
>500≤550	>932≤1022	0.54	-	-
>550≤600	>1022≤1112	0.44	-	-
>600≤650	>1112≤1202	0.36	-	-

Pressure Loss:

The pressure loss in Corrugated Hoses is 100% higher than in new welded steel pipes. This means that in case of Corrugated Hose - increase in diameter of 15% is required to reduce the pressure loss to the value of the pressure loss in steel pipes. Because of the nature of the bore of a corrugated hose, the pressure drops.

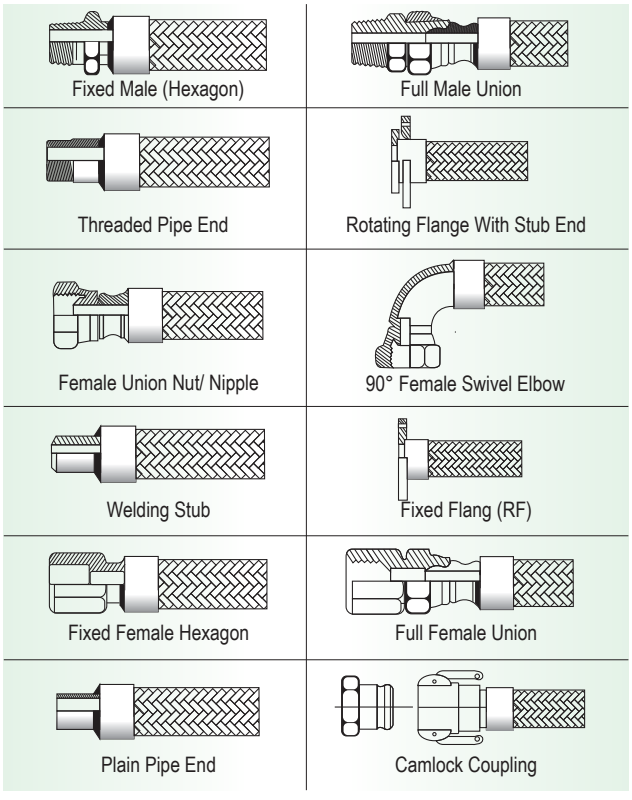


How to Use the Chart:

To utilize the chart, Read off on the base line the flow rate required. Where a vertical line from the selected point on the base line intersects the nominal bore line the pressure drop is shown on the vertical axis, corresponding to the point of intersection.

End Fittings :

Selecting the proper fittings for an application is largely determined by the mating fittings to which the hose assembly will be attached. Once the mating fittings have been identified, the hose fittings should complement the mating fittings in type, size, and alloy. Ensure that the fittings are chemically compatible with and are able to withstand the pressure and temperatures of both the media and the surrounding environment.



Other Products:

Interlock

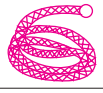
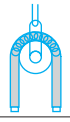
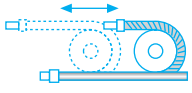
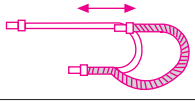
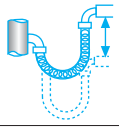
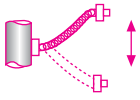
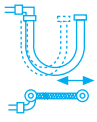
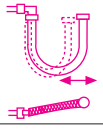
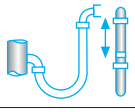
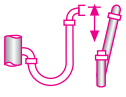
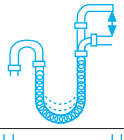
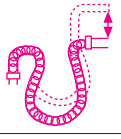
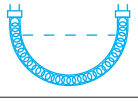
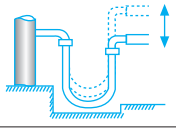
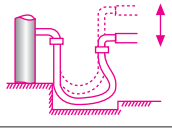
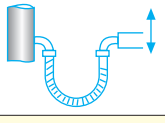
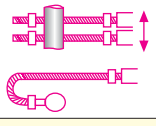
The hose is manufactured by spirally winding a pre-formed continuous metal strip, so that the edges interlock to form a hose. The stripwound/interlock hose is available with a directional flow liner. Alloys include galvanized and stainless steel. Standard sizes range from 5/32" through I.D. A variety of size, length and end fitting configurations are available.

Bellow

Metal Expansion Joints are generally used to absorb movement in piping caused by thermal changes. Standard bellows are made of 304, 321 & 316 stainless steel. End fittings include welding nipples, fixed flanges or floating flanges. Standard pipe sizes range from 2" & above. A variety of size, length and End Fitting configurations are manufactured. Units designed for many special applications and are built to customer specifications.

Installations:

Stainless steel flexible hose assemblies should be installed in the right manner to obtain satisfactory service and longer life. The sharp bending near the end connection stressed and twisted mounting and excessive fatigue is the main causes of premature failure of the assemblies. Correct and incorrect modes are shown in the table:

Right		Wrong	
In order to maintain allowable bending radium, the flexible hoses folded in convolution have to be erected and stretched out for use.		Please note that the directly pull one end of folded hose is forbidden.	
Use semi-round pulley to maintain allowable bending radium.		Extreme bending will break up the hose.	
Apply the rotating trolley, being synchronous with flexible hose, to avoid unsuitable bending.		The choice of over-long length will cause unregulated bending.	
Apply rigid elbow fitting at the slight bending part in order to ensure the bending radium of hose.		Unsuitable bending will reduce the duration period of flexible hose.	
Use rigid elbow connection with guarantee that the movement of flexible hose at two ends should be on the same line.		It can reduce duration period of flexible hose moving in a state of tortuosity.	
The movement direction of hose and its installation should be maintained in the same plane.		Over-bending will cause damage to the hose.	
Use rigid bending at the place of bending to make the hose be in the shape of lineal tubing.		It can reduce duration period of flexible hose moving in a state of tortuosity.	
Apply rigid elbow fitting in order to ensure the bending radium of hose when moving.		Too slight bending can cause damage to flexible hose.	
Allowable minimum being radium should be ensured when installing hose.		It is forbidden that too short length of hose is chosen to avoid excessively slight bending.	
Hose should be kept away from other things when moving.		Hose can be damaged when blocked by other things when moving.	
The movement direction of hose and its installation should be maintained in the same plane.		It can reduce duration period under the condition of hose ends moving in different planes.	

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