



FLEXIBLE METAL HOSE



INTRODUCTION

Corrugated metal hose are manufactured to ISO 10380, AS 4041, AS 3992, and BS 6501 (Part 1, 1991).

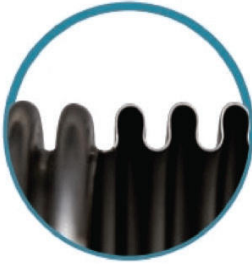
Flexible Hose assemblies are engineered and fabricated in accordance with our quality process to provide flexibility, strength and reliability to meet our customer's technical specification.

The advantages of using stainless steel corrugated tube and braid metal hose include:

1. Suitable for wide temperature ranges from -270°C to $+816^{\circ}\text{C}$.
2. Compensates for thermal movement, vibration and noise in the piping system.
3. Fire resistant.
4. Corrosion resistant.
5. Ability to accommodate low and high pressure ranges.

BELLOWS TYPE

Annular	Super Annular	SUS304 SUS316L	▪ Thin wall, numerous annular corrugations. ▪ Even thickness throughout the corrugations. ▪ Excellent durability and excellent pressure resistance.
	Super Bellow	SUS316L	▪ Extra-thin wall, numerous annular corrugation. ▪ Flexibility, excellent absorption of vibration, excellent durability against repetition.
	Tuf Omega Bellows	SUS304 SUS316L SUS321	▪ Closed pitch, strong against repetition bending and vibration.
	Tuf Omega Tube	SUS304 SUS316L SUS321	▪ Excellent durability and excellent pressure resistance.
	Omega 2ply Bellows	(Inner)/SUS316L (Outer)/SS304	▪ Excellent flexibility and durability, safety design according to 2ply construction.
Spiral	Excellent Tube	SUS304 SUS316L	▪ Excellent durability and excellent pressure resistance.
	Soft Tube	SUS304	▪ Small spring rate multipurpose tube.
	UFO Flex	SUS321	▪ Resistance for high pressure and absorption for repetitious vibration.
	Ultra Soft Flex	SUS321	▪ Excellent flexibility and excellent absorption of vibration



ANNULAR CORRUGATION SUPER ANNULAR & SUPER BELLOW

Construction

Even thickness throughout the corrugations, excellent durability. It can remove the twisting raise the durability braid shows calculated figures at ambient.

- Tube without braid shows max pressure when pressurized and remaining elongation is nil.
- Maximum working pressure of flexible hose with single braid shows calculated figures at ambient.
- Maximum working pressure of flexible hose with double braid shows $\frac{1}{4}$ of burst pressure.
- Test pressure shows actual tested figures.



TUF OMEGA TUBE & TUF OMEGA BELLOWS

Construction

Excellent durability and excellent pressure resistance. Closed pitch, strong against repetition bending and vibration.

(*) Working and Burst pressure of flexible hose with single and double braid shows calculated figures at ambient



2 PLY OMEGA BELLOWS

Construction

Excellent flexibility and durability. Safety is higher according to 2ply constructions. It is excellent anti-corrosion because inner ply is adopted by SUS316L.

(*) Working and Burst pressure of flexible hose with single and double braid shows calculated figures at ambient



EXCELLENT TUBES & SOFT TUBES

Construction

Excellent durability and Excellent pressure resistance.

- Tube without braid shows max pressure when pressurized and remaining elongation is nil.
- Maximum working pressure of flexible hose with single braid shows calculated figures at ambient.
- Maximum working pressure of flexible hose with double braid shows $\frac{1}{4}$ of burst pressure.
- Test pressure shows actual tested figures.

NON WELDED SCREW TYPE



Features

- Maintenance free
- Connecting fittings are small, light, and efficient in piping works

Constructions

- Inserted swivel-nut into the straight pipe portion at tube end
- Tube end to be sealed by means of direct contact of metal surface by inserting adaptor

Nominal dia. : 8A ~ 25A



Features

- The tube developed exclusively for fan coil unit
- Maintenance Free
- Connecting fittings are small, light and efficient in piping works

Nominal dia. : 8A ~ 25A



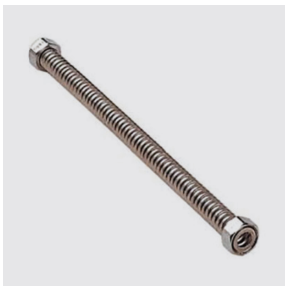
Features

- Flexibility, excellent absorption of vibration, excellent durability against repetition
- Large seal surface assures a firm seal

Constructions

- Sealed portion uni-molded with tube
- Tube, braid, fitting non-welded assembly construction

Nominal dia. : 15A ~ 50A



Constructions

- Stable quality approved by Japan Water Supply Association
- Bending free and easy setting even in small area
- Many variety of dia. & length

SCREW WELDED TYPE

**Feature**

- Easy piping work and economical price

Construction

- Union fitting to be set loose

Nominal dia. : 10A ~ 50A

**Feature**

- Welding part is used to stainless steel, good corrosion resistance

Construction

- Union fitting to be set loose

Nominal dia. : 10A ~ 50A

**Feature**

- Material of fittings can be selected according to fluid

Construction

- Socket to be put onto tube

Nominal dia. : 8A ~ 50A

**Feature**

- Material of fittings can be selected according to fluid

Construction

- Nipple to be put onto tube

Nominal dia. : 8A ~ 50A

**Feature**

- One touch fit or removal with piping

Construction

- Coupler is screwed into flexible tube with nipple

Nominal dia. : 10A ~ 80A

**Feature**

- One touch fitting with piping

Construction

- Quick coupling is screwed into flexible tube with nipple

Nominal dia. : 10A ~ 80A

**Feature**

- One touch fitting with piping

Construction

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Nominal dia. : 10A ~ 80A

**Feature**

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FERRULE FITTING (WELDED TYPE)



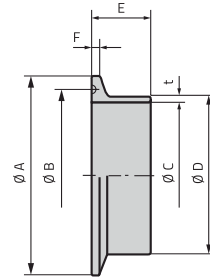
Feature

- As ferrule are small, and light, easy for disassemble maintenance

Construction

- Construction Ferrule welded with tubes

Nominal dia. : IDF : IS ~ 61/2S



WELDED FLANGE TYPE



Feature

- As the both ends flanges are loose, pipe laying work is easily done

Construction

- The tube is butt-welded to the lap joint. Flanges at both ends are loose

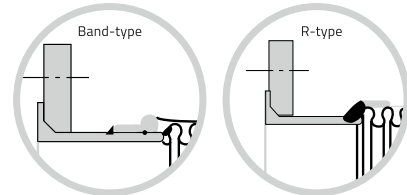
Nominal dia. : 10A ~ 50A



Construction

- The standard flange is loose at the both end

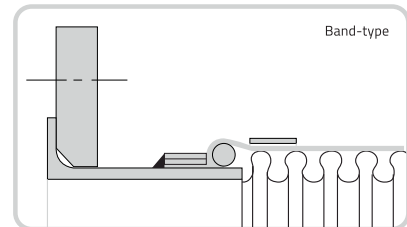
Nominal dia. : 65A ~ 300A



Construction

- The standard flange is fixed at one end loose at the other end

Nominal dia. : 350A ~ 600A



NON WELDED TYPE



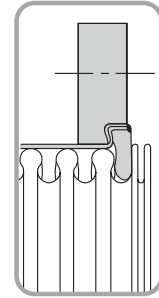
Features

- The effective length is long, allowing pipe laying with vibrations and repeated off-sets
- Connecting surface are all stainless steel

Construction

- Non welded swivel flanges are loosely installed on the tube enabling connection to standard flanges

Nominal dia. : 120A ~ 300A



Features

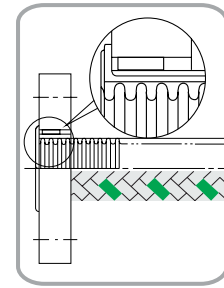
- Large seal surface assures firm seal
- No risk of deterioration of material or stain because of non-welded
- Connecting surface are all of stainless steel

Constructions

- Non welded swivel flanges are loosely installed on the tube enabling connection to standard flanges
- Integrate seal surface with tube
- End of braid is pressed and fixed with press-ring

Nominal dia. : 20A ~ 50A

Material : Stainless Steel



PTFE INSERT



Denso & Eslon Tape for Underground

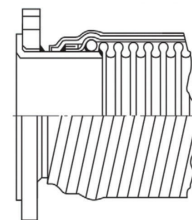
Anti Corrosive Type

Nylon fabric tape consisting of anti-rust agent is wound onto the hose. It forms the semipermanent viscosity adhesive layer which is resistant to acid, alkali, and salt.

Working Temperature Range : -170°C ~ 55°C

Protection Type

Adhesive vinyl chloride tape protects the hose from splashes of corrosive liquid and friction with other parts.



FITTING OPTION



Quick Coupling

High versatility Materials:

- Bronze (casting)
- Stainless Steel (SUS316)
- Aluminium Alloy
- High Quality and Superb Interchangeability:
as manufactured to meet MIL-C27487

Fittings & Flanges

Flanges or fitting is very popular to use in piping system. Fitting specific use in small diameter with high pressure and temperature. There are 3 standard dimension of flanges:

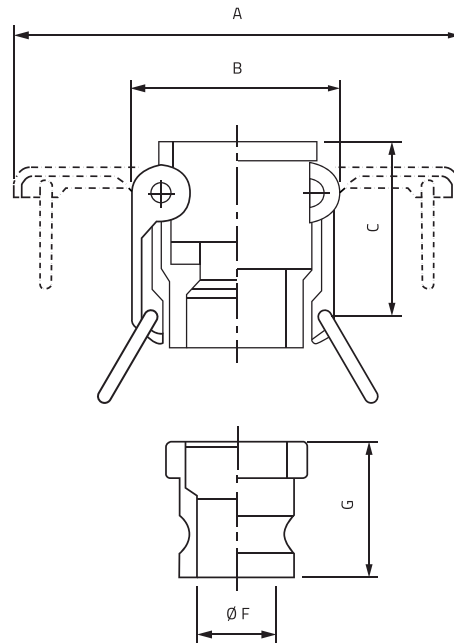
1. ANSI
2. JIS
3. DIN

Classified fittings base on the type of thread:

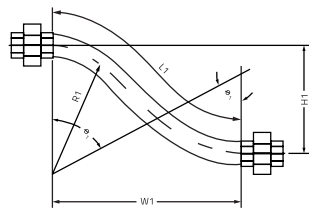
1. ISO Metric
2. NPT Thread
3. BSP Thread
4. UNC (Unified Coarse)/UNF (Unified Fine) Thread

Type of fittings and flanges:

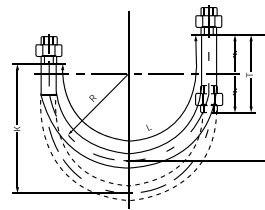
1. Slip On Flanges
2. Hexagonal male
3. Female Swivel/Union
4. Lapped Joint & Stub end
5. Welding Neck Flange
6. Internal/External Threaded Pipe
7. Etc.



LENGTH OF FLEXIBLE TUBES FOR PIPING WITH MOVEMENT & PREVENTIONS OF CORROSION



Offset motion

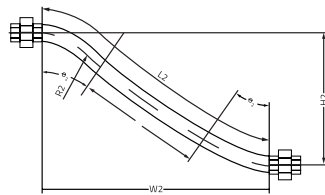


Differential U (1)

Offset motion

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

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



Offset motion

$$L1 = 2R1\theta_1$$

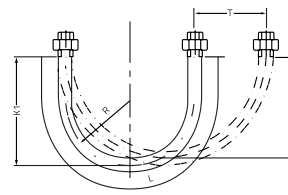
$$W1 = 2R1\sin\theta_1$$

$$H1 = 2R1(1 - \cos\theta_1)$$

$$L2 = 2R2\theta_2$$

$$W2 = 2R2\sin\theta_2 + \cos\theta_2$$

$$H2 = 2R2(1 - \cos\theta_2) + \sin\theta_2$$



Differential U (2)

Offset motion

$$L = 4R + 1.57T$$

$$K1 = 1.43R + 0.785T$$

$$K2 = 1.43R + T/2$$

LENGTH REQUIRED FOR FLEXIBLE TUBE

Type	Deflection												
	10 (mm)	20 (mm)	30 (mm)	40 (mm)	50 (mm)	60 (mm)	70 (mm)	80 (mm)	90 (mm)	100 (mm)	120 (mm)	140 (mm)	160 (mm)
10A	85	165	245	330	410	490	575	655	735	820	980	1145	1305
15A	85	165	245	330	410	490	575	655	735	820	980	1145	1305
20A	85	165	245	330	410	490	575	655	735	820	980	1145	1305
25A	90	165	245	330	410	490	575	655	735	820	980	1145	1305
	85	165	245	330	410	490	575	655	735	820	980	1145	1305
32A	90	165	245	330	410	490	575	655	735	820	980	1145	1305
	85	165	245	330	410	490	575	655	735	820	980	1145	1305
40A	100	165	245	330	410	490	575	655	735	820	980	1145	1305
	90	165	245	330	410	490	575	655	735	820	980	1145	1305
50A	100	165	245	330	410	490	575	655	735	820	980	1145	1305
	90	165	245	330	410	490	575	655	735	820	980	1145	1305
65A	105	165	245	330	410	490	575	655	735	820	980	1145	1305
80A	105	165	245	330	410	490	575	655	735	820	980	1145	1305
100A	120	170	245	330	410	490	575	655	735	820	980	1145	1305
125A	130	185	245	330	410	490	575	655	735	820	980	1145	1305
150A	145	200	245	330	410	490	575	655	735	820	980	1145	1305
200A	175	245	300	340	410	490	575	655	735	820	980	1145	1305
250A	190	270	330	380	425	490	575	655	735	820	980	1145	1305
300A	220	310	380	440	490	535	580	655	735	820	980	1145	1305

- The above table shows the effective lengths of Flexible Hose
- The overall length is calculated by adding the effective length with the fittings

- The above figures are minimum length. It is recommendable on fittings. (As a rough guideline, the above figures + hose diameter x 2 would be preferable)
- The required length for parallel deflection would be formulated as next. (to absorb 1% of hose extension)

10A - 50A
25A - 300A
25A - 50A

I Super Annular
I Tuf Omega Tube
I Upper Figure: Super Annular
Lower Figure: Tuf Omega Tube

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