ARSEN

ARSEN BOOK
(ALL PRODUCTS)
-2015 EDITION-

EN ISO 10380
PRODUCED AND TESTED

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CORPORATE

Corporate

Arsen Industrial Installation Products Co.Ltd. established in January of 2003 to produce flexible metal hoses, rather than trying to increase variety of products, focusing on main issues, aims to produce higher quality materials with over 10 years of experience in manufacturing. By utilizing feedbacks from customers, conducting automation in all areas of production, Arsen Ltd. has continuously improved quality and has gained customer satisfaction and appreciation both in Turkey and over 30 countries as exporter.

Arsen Co.Ltd. has started an export attack with 10% in 2009 and come near its target of contributing country's economy more by exporting 45% of total production.

Arsen Co.Ltd. produces fire sprinkler hoses, fan coil hoses, solar Connection Hoses, boiler hoses, seismic omega loop hoses, metal expansion joints and their accessories.

Quality Policy

Customer satisfaction is our primary goal.

In order to meet the customer needs, to make management and staff to work in harmony with our quality management system and in a positive approach,

By following a policy open to technical improvements, to make investments for a quick and perfect service in order to be a leader in technical installation device production,

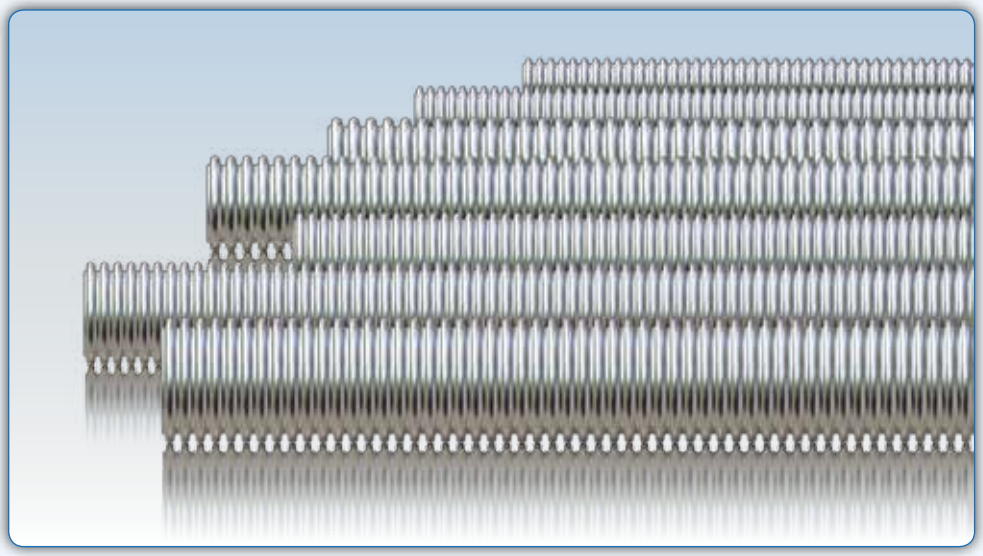
To make improvement in our quality system in order to produce products which follow related standards, which are models with their material and workmanship and are accepted worldwide,

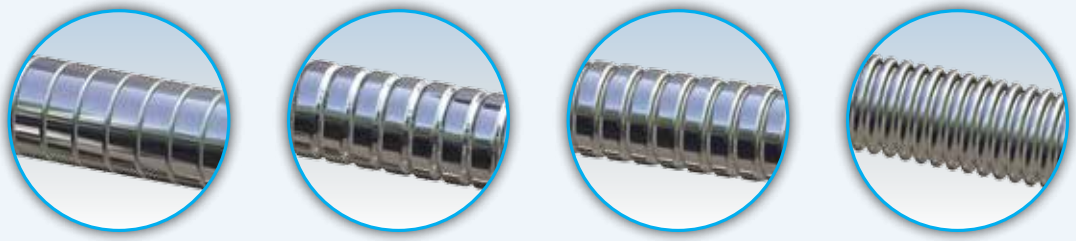
For our quality policy to be accepted and to help personal improvement, by organizing trainings and several activities, to arrange a working environment which staff feel safe to work and be proud to be a member of our company are our several objectives.

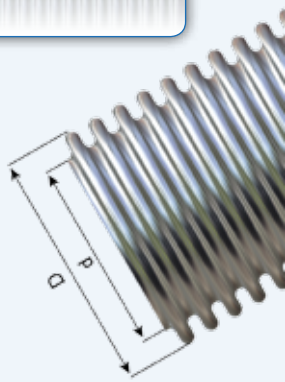
CONTENTS

FLEXIBLE METAL HOSES WITHOUT BRAIDING

Flexible metal hoses are produced by welding a 0.15 –0.40 mm thick stainless steel strip longitudinally under protective gas from inside and outside and then forming either mechanically or hydraulically. Mechanical forming is a four step process as can be seen below. Process called forming is necessary to shape thin sheet without being harmed. It also makes it possible to produce metal hoses in any profile without extra costs for molds.



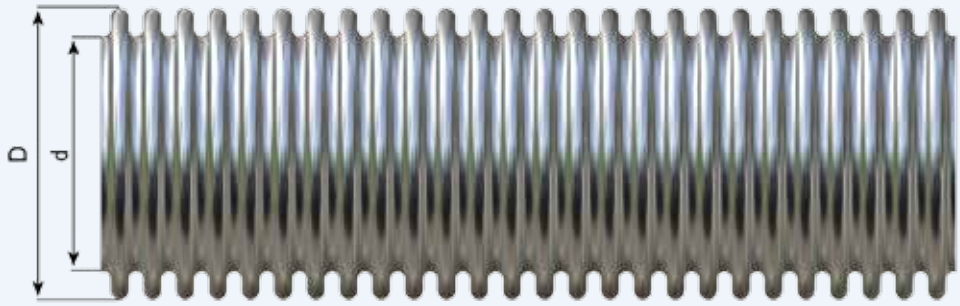




Standard Pitch Metal Hoses

Dimensions and Operating Conditions

DN		Inner Diameter	Outer Diameter	d D	Working Pressure	Bend Radius		Weight (±) %10
(mm)	(inch)	d (mm)	D (mm)	tol. (±)	20 °C (bar)	Static	Dynamic	(kg/m)
006	1/4"	6.1	9.6	0.20	25	15	75	0.06
008	5/16"	8.4	12.2	0.20	16	16	120	0.08
010	3/8"	10.1	14.3	0.20	10	18	130	0.10
012	1/2"	12.2	16.8	0.20	9.0	20	135	0.11
016	5/8"	16.2	21.8	0.20	7.0	30	145	0.17
020	3/4"	20.3	26.6	0.20	4.0	35	160	0.22
025	1"	25.4	32.2	0.30	3.0	40	185	0.33
032	11/4"	34.3	41.1	0.30	2.5	50	250	0.48
040	11/2"	40.0	49.6	0.30	2.5	60	290	0.57
050	2"	50.5	60.5	0.40	1.6	70	330	0.70
065	21/2"	65.5	80.0	0.60	1.5	115	400	1.05
080	3"	80.4	96.0	0.60	1.5	125	500	1.10
100	4"	100.5	117.0	0.85	1.2	165	600	1.40
125	5"	125.2	149.5	0.85	0.9	210	690	2.65
150	6"	150.6	175.5	1.50	0.9	240	830	3.25
200	8"	200.0	227.0	2.50	0.7	340	1040	4.90
250	10"	250.0	278.0	4.00	0.5	435	1200	7.60
300	12"	300.0	337.0	6.00	0.3	525	1350	11.00



Wide Pitch Metal Hoses

Dimensions and Operating Conditions

DN		Inner Diameter	Outer Diameter	d D	Working Pressure	Bend Radius		Weight (±) %10
(mm)	(inch)	d (mm)	D (mm)	tol. (±)	20 °C (bar)	Static	Dynamic	(kg/m)
006	1/4"	6.3	9.6	0.20	40	11	It is not appropriate for dynamic usage.	0.05
008	5/16"	8.4	12.2	0.20	25	15		0.06
010	3/8"	10.1	14.2	0.20	16	17		0.08
012	1/2"	12.4	16.7	0.20	16	19		0.09
016	5/8"	16.6	22.0	0.20	10	25		0.14
020	3/4"	20.4	26.0	0.20	10	30		0.16
025	1"	25.6	31.8	0.30	8.0	35		0.24
032	11/4"	34.0	40.7	0.30	4.0	40		0.37
040	11/2"	40.0	49.0	0.30	4.0	50		0.54
050	2"	50.8	59.8	0.40	3.0	60		0.60

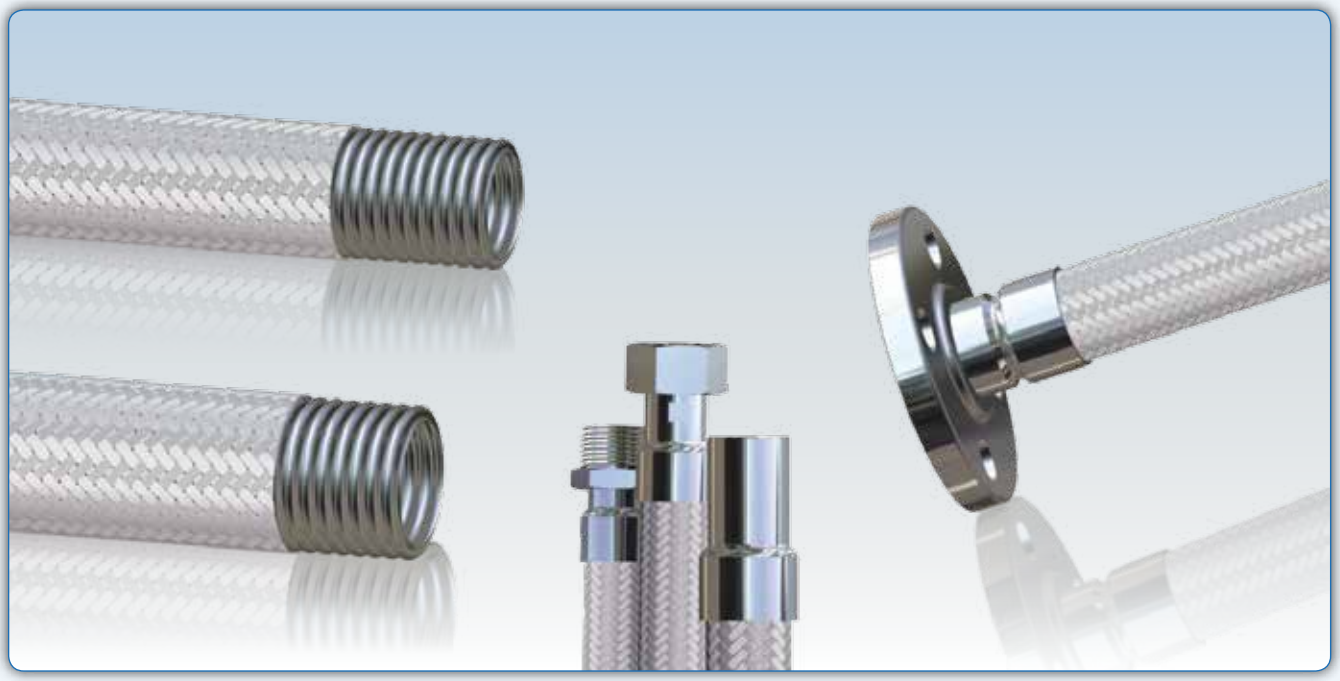
Close Pitch Metal Hoses

Dimensions and Operating Conditions

DN		Inner Diameter	Outer Diameter	d D	Working Pressure	Bend Radius		Weight (±) %10
(mm)	(inch)	d (mm)	D (mm)	tol. (±)	20 °C (bar)	Static	Dynamic	(kg/m)
006	1/4"	6.1	9.8	0.20	16	20	70	0.09
008	5/16"	8.2	12.4	0.20	10	25	90	0.10
010	3/8"	10.1	14.5	0.20	8.0	30	100	0.13
012	1/2"	12.1	17.0	0.20	7.0	35	110	0.15
016	5/8"	16.2	22.0	0.20	5.0	40	120	0.23
020	3/4"	20.3	26.9	0.20	4.0	50	130	0.30
025	1"	25.2	32.5	0.30	2.5	60	150	0.42
032	11/4"	33.7	41.2	0.30	2.0	70	230	0.60
040	11/2"	40.0	49.6	0.30	1.5	80	240	0.85
050	2"	49.7	60.5	0.40	1.0	100	260	0.99

FLEXIBLE METAL HOSES WITH BRAIDING

ARSENFLEX®



Flexible metal braided hoses and fittings can be used widely in systems like water, steam, hot oil and gas with their resistance to pressure and flexible structure. They are utilized for conducting liquids, compensating the problems originated from installation, absorbing vibrations and expansions.

Operating Conditions

Operating Pressure: See Table.4
Operating Temperature: -200 +600 ºC
Nominal Diameter: DN6-300 / 1/4”-12”

Material Specifications

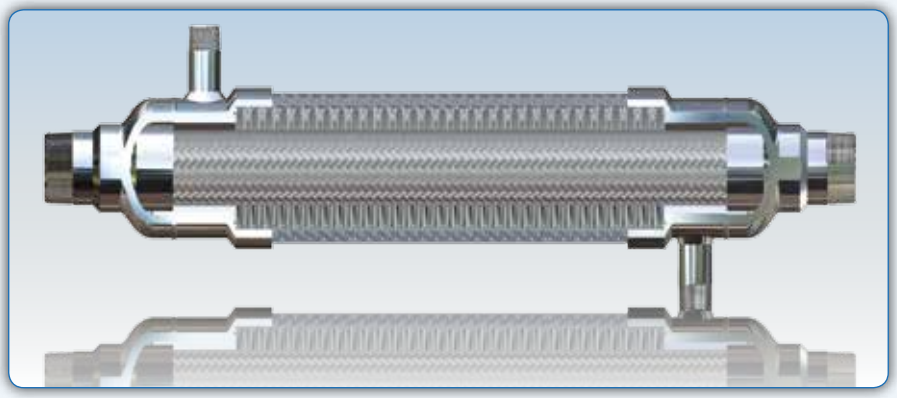
Hose: AISI 316L-304L-321 Stainless Steel
Wire Braid: AISI 304 Stainless Steel
Connections: Carbon Steel - Stainless Steel

Flexible metal hoses may be strengtened by double braiding in order to increase their resistance to pressure and environmental conditions. It is also possible to reinforce them by springs with different wire thicknesses or by stripwounds to lengthen their service life for more severe environmental conditions.

Spring Loaded and Stripwound Reinforced Hoses

Vibration Hoses

Jacketed Hoses

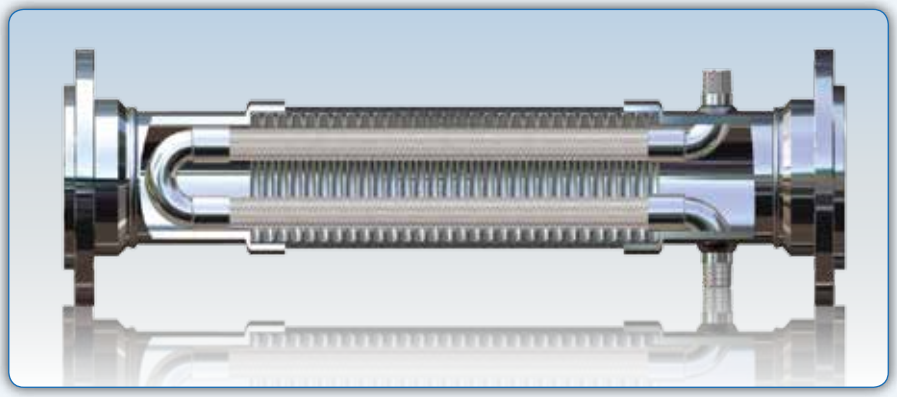


In some cases, conveyer hose (inner) is enclosed or jacketed by another bigger diameter hose (picture left). Hoses are connected to each other with specially designed fittings in that case.

The aim here is to protect inner media (viscous materials, fuel oil, etc.) from freezing and help keeping high flow rate through inner hose.

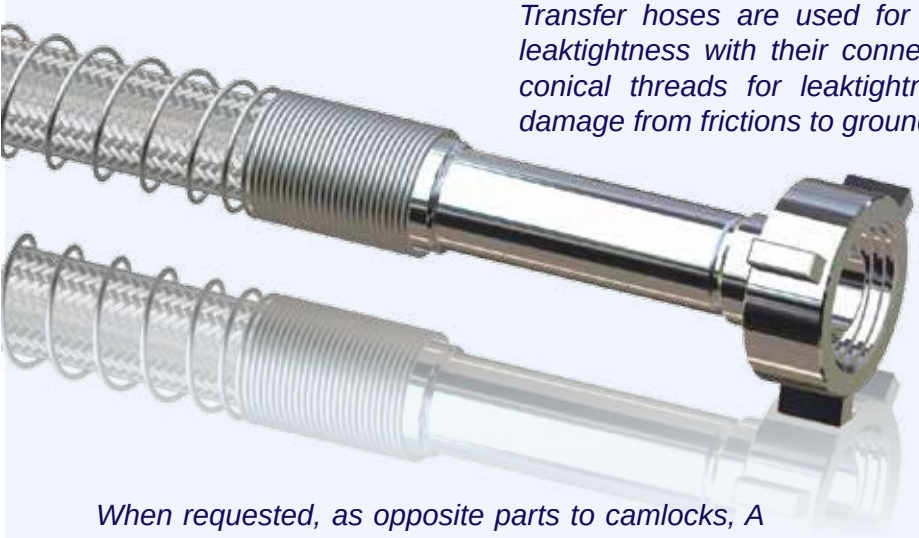
In some other cases, a smaller diameter inner hose which conveys a high-temperature water or steam is assembled inside a bigger diameter outer hose in order to provide a high flow rate of main fluid inside outer hose (picture right).

Jacketed hoses are designed specifically to be used in such systems and may be manufactured in several diameters and dimensions.



Transfer Hoses

Transfer hoses are used for conducting liquids or gases that requires leaktightness with their connections produced special to area of usage, conical threads for leaktightness, and springs that ensures minimum damage from frictions to ground.



Transfer hoses are offered with camlocks that provides quick connections.

They provide usability in camlock changes with their male and female threads to be adapted to B type and D type camlocks.

When requested, as opposite parts to camlocks, A type camlock for female output and F type camlock for male output, may also be offered with produced hoses. Please consult for dimensions and details.

Metal Hoses With Braiding Dimensions and Operating Conditions

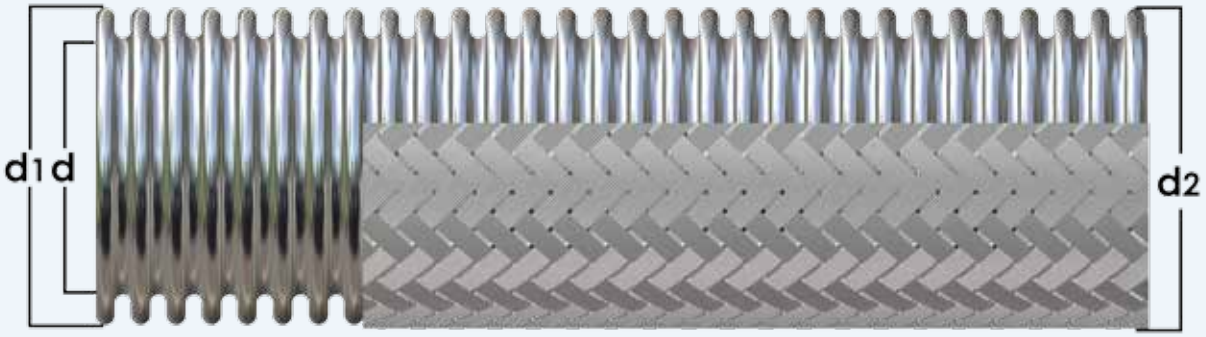


Table.4

DN		Inner Dia.	Outer Diameter		d d1 d2	Without Braiding		Single Braiding		Double Braiding		Bend Radius			
												Single Braiding		Double Braiding	
mm	inch	d (mm)	d1 (mm)	d2 (mm)	tol. (±)	20 °C (bar)	kg/m	20 °C (bar)	kg/m	20 °C (bar)	kg/m	Static	Dynamic	Static	Dynamic
6	1/4"	6.1	9.6	10.7	0.20	24	0.07	198	0.15	297	0.24	25	80	35	100
8	5/16"	8.2	12.1	13.6	0.20	17	0.08	176	0.20	264	0.33	35	125	45	145
10	3/8"	10.1	14.3	15.6	0.20	12	0.10	131	0.21	196	0.34	40	130	50	150
12	1/2"	12.2	16.8	18.3	0.20	9.0	0.11	93	0.22	140	0.35	45	140	55	160
16	5/8"	16.2	21.8	23.8	0.20	7.0	0.17	85	0.36	128	0.58	60	160	70	190
20	3/4"	20.3	26.6	28.4	0.20	4.0	0.22	76	0.45	115	0.71	70	170	80	200
25	1"	25.4	32.2	34.3	0.30	3.0	0.33	60	0.65	90	1.05	85	190	100	230
32	11/4"	34.3	41.1	42.9	0.30	2.5	0.48	54	0.93	80	1.45	105	260	120	310
40	11/2"	40.0	49.6	54.0	0.30	2.5	0.57	42	1.23	63	2.00	130	300	160	360
50	2"	50.5	60.5	62.4	0.40	1.6	0.70	35	1.40	52	2.20	160	320	200	380
65	21/2"	65.5	80.0	82.0	0.60	1.5	1.05	26	2.00	42	3.00	200	440	250	520
80	3"	80.4	96.0	98.0	0.60	1.5	1.10	18	2.20	29	3.35	220	550	270	640
100	4"	100.5	117.0	119.0	0.85	1.2	1.40	16	3.00	25	4.65	230	660	300	760
125	5"	125.2	149.5	152.0	0.85	0.9	2.65	16	4.95	25	7.35	280	760	340	900
150	6"	150.6	175.5	178.0	1.50	0.9	3.25	12	5.80	19	8.50	320	920	400	1070
200	8"	200.0	227.0	230.0	2.50	0.7	4.90	10	9.30	16	13.85	450	1150	550	1250
250	10"	250.0	278.0	281.0	4.00	0.5	7.60	8	14.10	12	20.80	580	1330	680	1580
300	12"	300.0	337.0	340.0	6.00	0.3	11.00	6	18.40	8	25.90	700	1500	800	1800

Temperature Correction Factor

Temperature is one of the factors that reduces the hose's resistance to pressure. Material's pressure resistance can be figured out by multiplying its operating temperature with the related temperature correction factor.

Table.5

Temperature (ºC)	-200	-150	-100	-50	0	20	50	100	150	200	250	300	400	500	600
Correction Factor	1.0	1.0	1.0	1.0	1.0	1.0	0.92	0.83	0.75	0.69	0.65	0.61	0.56	0.53	0.34

Metal Hoses With Braiding Connection Types

Female/Male

Welding Neck/Socketed

Floating/Fixed Flanged

Male/Female Union

Conical Conn.

Sleeve

Pipe Nipple

Special Flange

Ferrule

Elbow (45°-90°)

Reducing

SPRINKLER HOSES WITH BRAIDING

ARSENFLEX®

ARSEN-SP sprinkler hose and connection kit can be safely used in fire extinguishing systems due to its structure not being affected by seismic motions and the braided hose's resistance to heat and pressure. Primary advantages are connecting the sprinkler to the fire line with minimum effort and installing the device easily into ceiling with its connection kit. Public places like shopping centers, hotels, theaters, cinemas where the response time is really important are where the system is mostly chosen.

There are many advantages using Arsen-SP Sprinkler Hose and Connection Adapter to mount sprinkler systems. Most important ones are minimum workmanship time provided by easy installation, safer sprinkler systems against seismic motions and adjustability without being dependent upon design of installation lines. Proficiency and time is needed for adjusting the steel installation line to the desired sprinkler mounting point using elbows, couplings etc. By using Arsen SP Sprinkler Adapter, it is quite easy to align and tighten sprink side of sprinkler hose with desired point (usually middle point of grid) of ceilings. Additionally, due to convenient design of hose fixing apparatus, sprink side of hose can be adjusted on vertical axis. As a result, height of sprinkler head and escutcheon can be adjusted relative to ceilings.

Material Specifications

Hose:	AISI 316L Stainless Steel
Wire Braid:	AISI 304 Stainless Steel
Connections:	Carbon Steel (St.)
Connection Set:	Carbon Steel (Zinc Coated)

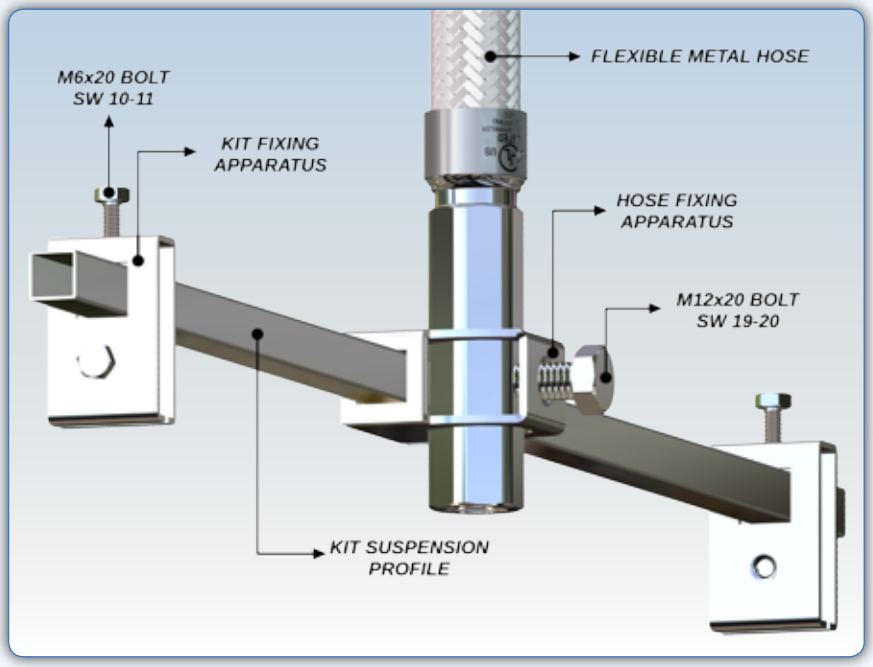
Dimensions and Operating Conditions

Approval Type	UL Listed	FM Approved
Hose Diameter	DN 20 - 3/4"	DN 25 - 1"
Connection Diameter	Nipple Side 1" / Sprink Side 1/2"	
Standard Length	600 - 900 - 1200 - 1500 - 1800 mm	
Operating Pressure	20 bar / 290 psi	
Ambient Temperature Rating	149 °C / 300 °F	
Minimum Bending Radius	70 mm	100 mm
Largest K-Factor	8.0 GPM/psi½	
Wet – Dry Systems	Both	
Connection to Fire Sprinkler	Direct	

Friction Losses and Specifications (UL Listed)

Model No	Hose Length	Input Diameter	Output Diameter	Max. No of 90° Bends	Equivalent Length of 1" Sch 40 Pipe	Maximum Pressure
A-SP600-20	0,6m 2ft	1 inch	1/2 inch	2	40	20 bar/290 psi
A-SP900-20	0,9m 3ft	1 inch	1/2 inch	3	60	20 bar/290 psi
A-SP1200-20	1,2m 4ft	1 inch	1/2 inch	3	71	20 bar/290 psi
A-SP1500-20	1,5m 5ft	1 inch	1/2 inch	3	87	20 bar/290 psi
A-SP1800-20	1,8m 6ft	1 inch	1/2 inch	3	107	20 bar/290 psi

Sprinkler Hoses With Braiding Product Specifications / Technical Drawings



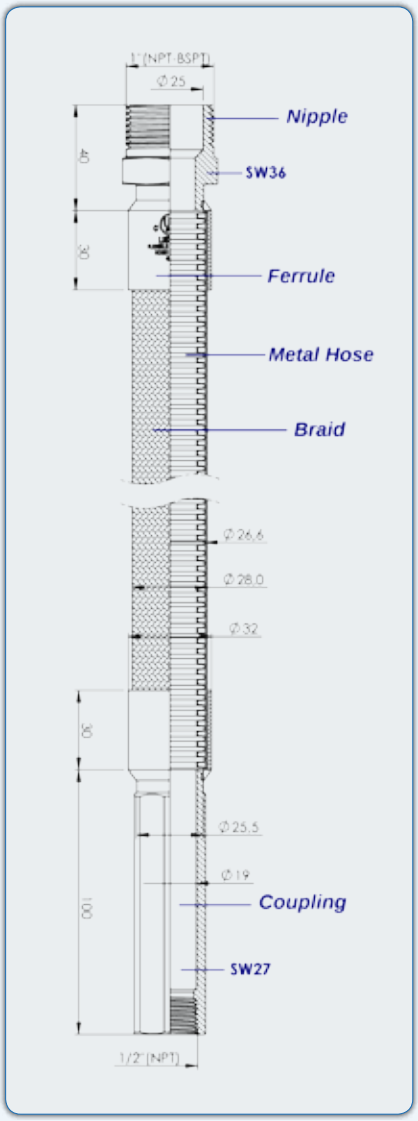

Kit Fixing Apparatus


Kit Fixing Apparatus

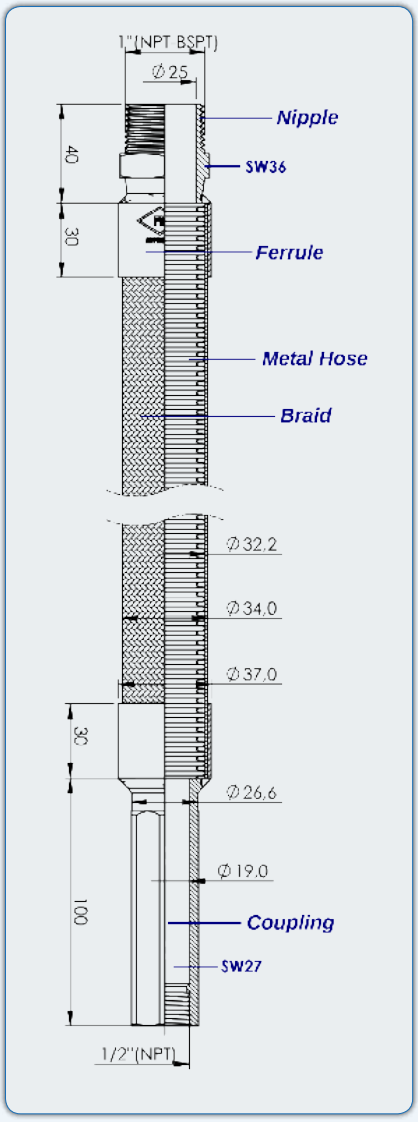

Hose Fixing Apparatus


Kit Suspension Profile

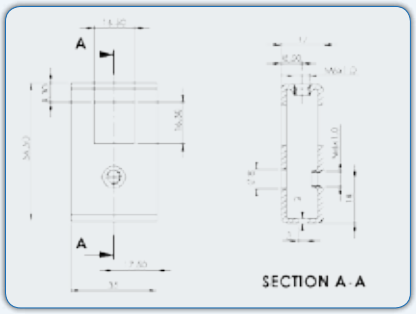
DN20 Hose Technical Drawing

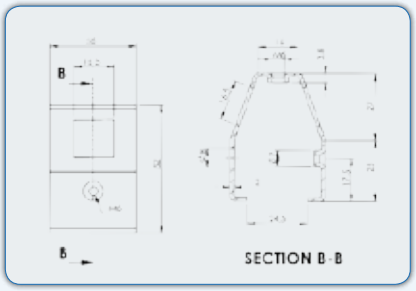


DN25 Hose Technical Drawing



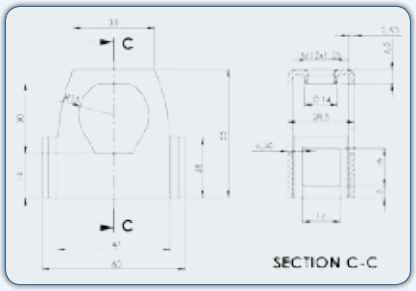
Kit Fixing Apparatus T. Drawing



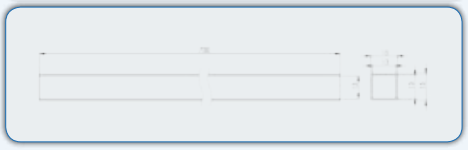


Kit Fixing Apparatus T. Drawing

Hose Fixing Apparatus T. Drawing



Kit Suspension Profile Technical Drawing



Ceiling Specifications

These connections are designed for use in ceilings with grids that meet ASTM C 635 (Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings) and ASTM C 636 (Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels) referenced by the IBC. The three structural classifications are the following: Light-Duty Systems, Intermediate-Duty Systems and Heavy-Duty Systems. These connections have been approved for use in all Intermediate-Duty and Heavy-Duty structural classifications.

System Specifications

Arsen SP products are intended for use in hydraulically designed wet or dry pipe sprinkler connections per NFPA 13, 13R, and 13D guidelines and for direct connection to fire sprinklers.

Safety Of Sprinkler Under Seismic Motions

It is quite important that safety systems are able to work free of problems. ARSEN-SP Flexible Sprinkler Hose Connection reduces the probability of degradation caused by seismic motions.

NFPA 13 2007 Edition

9.2.1.3.3*	Flexible Sprinkler Hose Fittings.
A. 9.2.1.3.3	Examples of areas of use include clean rooms, suspended ceilings, and exhaust ducts.
9.2.1.3.3.1	Listed flexible sprinkler hose fittings and its anchoring components, intended for use in installations connecting the sprinkler piping to sprinklers, shall be installed in accordance with the requirements of the listing including any installation instructions.
9.2.1.3.3.2	When installed and supported by suspended ceilings, the ceiling shall meet ASTM C-635 and shall be installed in accordance with ASTM C-636.
9.2.1.3.3.3*	When flexible sprinkler hose fittings exceed 6 ft in length and are supported by a suspended ceiling a hanger(s) attached to the structure shall be required to ensure that the maximum unsupported length does not exceed 6ft.
A. 9.2.1.3.3.3	The committee evaluation of flexible sprinkler hose fittings supported by suspended ceilings was based upon a comparison of the weight of a 6 ft., 1 in diameter sch 40 water-filled flexible hose fitting weighing approximately 9 lbs. The information provided to the committee showed that maximum load shed to the suspended ceiling by the flexible hose fitting was approximately 6 lbs. and that suspended ceiling meeting ASTM C-635, Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension of Acoustical Tile and Lay-In Panel Ceiling, and installed in accordance with ASTM C-636, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels, can substantially support the load. In addition, the supporting material showed that the flexible hose connection can be attached to the suspended ceilings because it allows the necessary deflections under seismic conditions.

SPRINKLER HOSES WITHOUT BRAIDING

ARSEN-USP sprinkler hose without braiding ve connection adapter is produced using unbraided hose reinforced against pressure and can be safely used in fire extinguishing systems due to its structure not being affected by seismic motions.

Primary advantages are connecting the sprinkler to the fire line with minimum effort and installing the device easily into ceiling with its connection kit.

Public places like shopping centers, hotels, theaters, cinemas where the response time is really important are where the system is mostly chosen.

Material Specifications

Hose:	AISI 316L Stainless Steel
Connections:	Carbon Steel (St.)
Connection Set:	Carbon Steel (Zinc Coated)

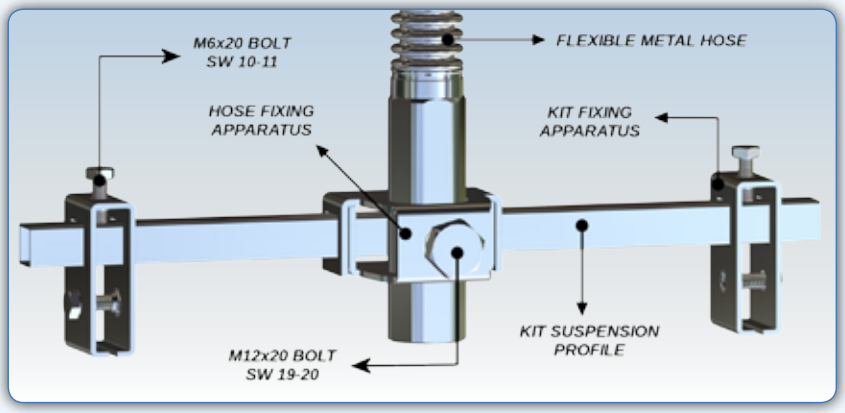
Dimensions and Operating Conditions

Hose Diameter	DN 20 - 3/4”	DN 25 - 1”
Connection Diameter	Nipple Side 1” / Sprink Side 1/2”	
Standard Length	600 - 900 - 1200 - 1500 - 1800 mm	
Operating Pressure	16 bar / 230 psi	12 bar / 175 psi
Ambient Temperature Rating	149 °C / 300 °F	
Minimum Bending Radius	170 mm	190 mm
Largest K-Factor	8.0 GPM/psi½	
Wet – Dry Systems	Both	
Connection to Fire Sprinkler	Direct	

Friction Losses and Specifications

Model No	***Hose Length***	***Input Diameter***	***Output Diameter***	***Max. No of 90° Bends***	***Equivalent Length of 1” Sch 40 Pipe***	***Maximum Pressure***
A-USP600-20	0,6m 2ft	1 inch	1/2 inch	2	40	16 bar/230 psi
A-USP900-20	0,9m 3ft	1 inch	1/2 inch	3	60	16 bar/230 psi
A-USP1200-20	1,2m 4ft	1 inch	1/2 inch	3	71	16 bar/230 psi
A-USP1500-20	1,5m 5ft	1 inch	1/2 inch	3	87	16 bar/230 psi
A-USP1800-20	1,8m 6ft	1 inch	1/2 inch	3	107	16 bar/230 psi

Sprinkler Hoses Without Braiding Product Specifications / Technical Drawings



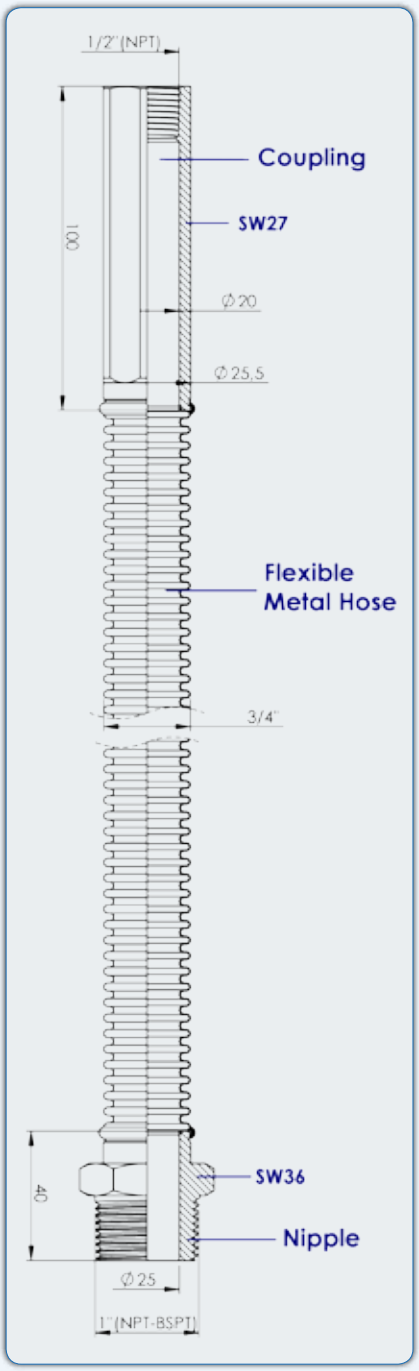
Kit Fixing Apparatus

Kit Fixing Apparatus

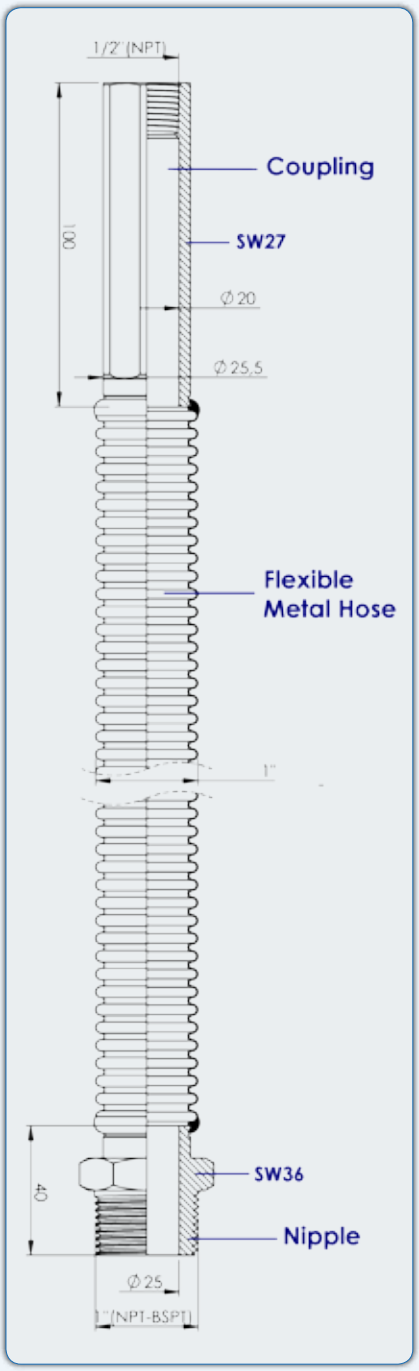
Hose Fixing Apparatus

Kit Suspension Profile

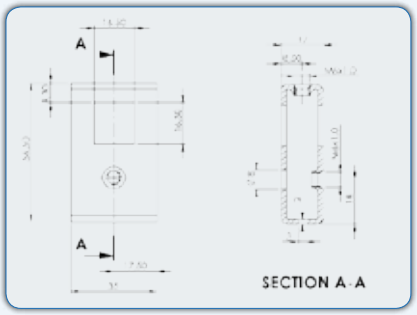
DN20 Hose Technical Drawing

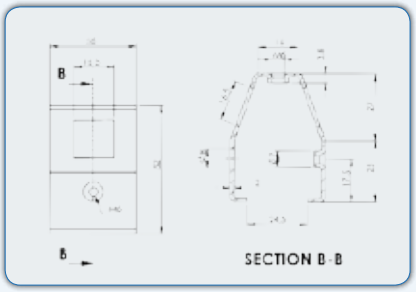


DN25 Hose Technical Drawing



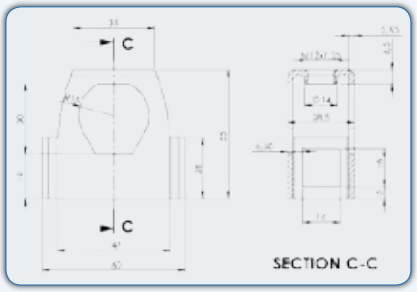
Kit Fixing Apparatus T. Drawing



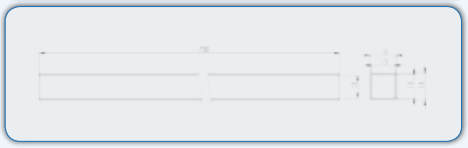


Kit Fixing Apparatus T. Drawing

Hose Fixing Apparatus T. Drawing

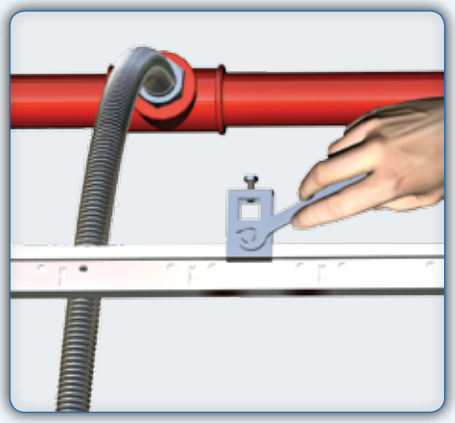


Kit Suspension Profile Technical Drawing

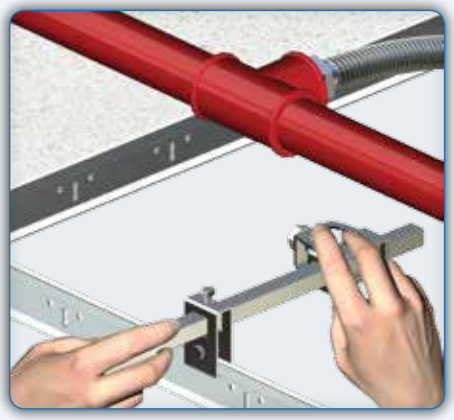


Sprinklerler Hoses Installation Instructions

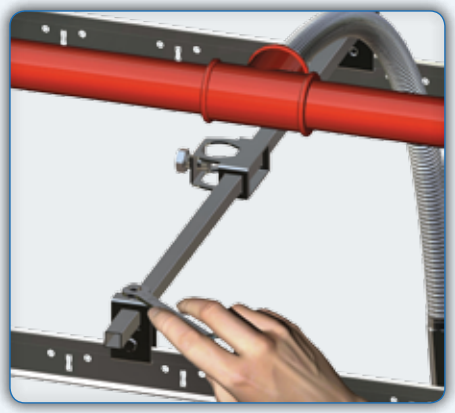
The hose is attached and tightened to the mechanical-t, tee or welded coupling on the fire line by a SW-36 wrench. On this process, because the thread of nut is conical (NPT, BSPT), no gasket is required. You may need to consult NFPA guidelines for using Teflon tape or pipe sealant during this process.



The right and left fixing apparatuses are attached to the approximate middle of metal grid by rule of thumb and tightened using a SW-10 wrench not to be fully tight. It is recommended not to complete tightening because further fine tuning may be required. At this phase, the bolts upper parts of the fixing apparatuses are not to be tightened.

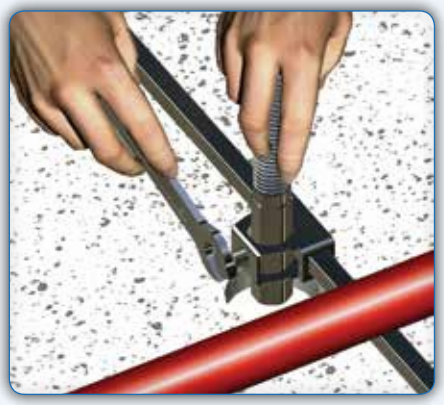


After putting the profile through right or left fixing apparatus, continue pushing the profile to the opposite direction at the same plane. Continue pushing until profile passes through hose fixing apparatus and the opposite kit fixing apparatus and profile has equal lengths stuck at both sides.



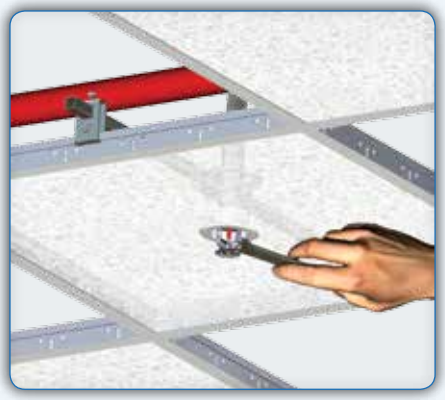
The upper bolts of right and left kit apparatuses are tightened using a SW-10 wrench.

It is recommended to do this by a torque-limited wrench at 2 pound-foot (2.7 N.m) torque.



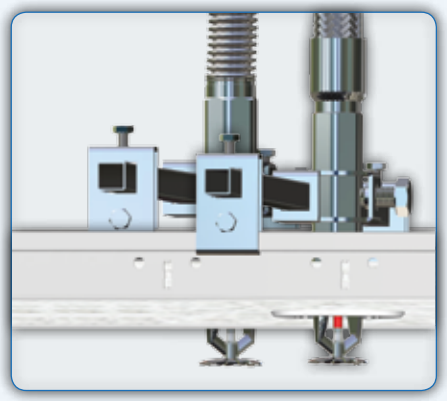
Sprink side of the sprinkler hose is placed in the hose fixing apparatus, and apparatus is adjusted to be aligned with the hole on ceiling. The bolt of the apparatus is tightened using SW-19 wrench. It is recommended to do this by a torque-limited wrench at 5 pound-foot (6.8 N.m) torque.

The whole set is aligned so that the sprink side of hose is aligned with the hole on ceiling. The bottom bolts of right and left kit fixing apparatuses are tightened using a SW-10 wrench. It is recommended to do this by a torque-limited wrench at 2 pound-foot (2.7 N.m) torque.



The sprinkler head and escutcheon are tightened to sprink end of hose according to NFPA and sprinkler head manufacturer's guidelines.Thread type of sprinkler head and hose is conical (NPT), so, no gasket is required. You may need to consult NFPA guidelines for using Teflon tape or pipe sealant during this process.

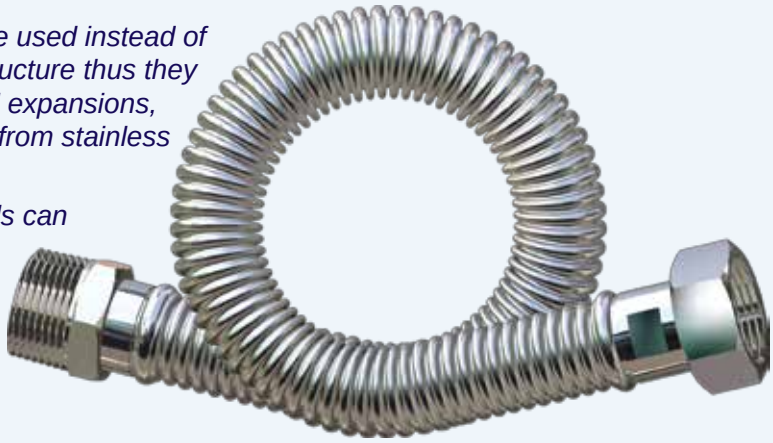
Loose the bolt on the hose fixing apparatus and adjust the level of sprink side of sprinkler hose relative to ceiling structure as desired. Finally tighten the bolt using a SW-19 wrench. It is recommended to do this by a torque-limited wrench at 5 pound-foot (6.8 N.m) torque.



Test the installation of sprinkler system against leaks per NFPA. Finally, sprinkler hose and connection adapter is ready to help protecting living beings and structures against the risk of fire. Resistance of our product against pressure, temperature, vibration and corrosion is tested in UL Laboratories, USA.

FAN COIL HOSES WITH BRADING / WITHOUT BRAIDING

ARSEN fan coil hoses with or without braiding can be used instead of pipes, couplings or elbows with their very flexible structure thus they provide quicker installation. Absorbing vibrations and expansions, flexing free of constrictions, decorative look resulted from stainless steel are some of main features.



Arsen Fan Coil Hoses as final connections to fan coils can save a great deal in fitting time. If the fittings are correctly selected, they can also be used to form a bypass loop during pressure testing and flushing to protect the fan coil. During service fan coil hose will prevent noise transmission and can compensate for pipe work expansion.

Arsen Fan Coil Hoses may be provided with or without insulation. Insulation is recommended in order to prevent sweating that may exist in heating and cooling systems. Selection of correct insulation lengthens service life and provides high efficiency as a result of preventing heat loses through hose assemblies.

A fan coil unit is a device consisting of a heating or cooling coil and fan. It is part of an HVAC system found in residential, commercial, and industrial buildings. Typically a fan coil unit is not connected to ductwork, and is used to control the temperature in the space where it is installed, or serve multiple spaces. It is controlled either by a manual on/off switch or by thermostat. Due to their simplicity, fan coil units are more economical to install than ducted or central heating systems with air handling units. Unit configurations are numerous including horizontal (ceiling mounted) or vertical (floor mounted).

Fan Coil Hoses Without Braiding Material Specifications

Hose: AISI 316L Stainless Steel
Connections: Carbon Steel (CrNi Coated)

Fan Coil Hoses With Braiding Material Specifications

Hose: AISI 316L Stainless Steel
Wire Braid: AISI 304 Stainless Steel
Ferrule: AISI 304 Stainless Steel
Connections: Carbon Steel (CrNi Coated)

Optional Material Specifications

Insulation: Elastomeric Rubber
Insulation Ferrule: Plastic

Fan Coil Hoses With Brading / Without Brading Operating Conditions

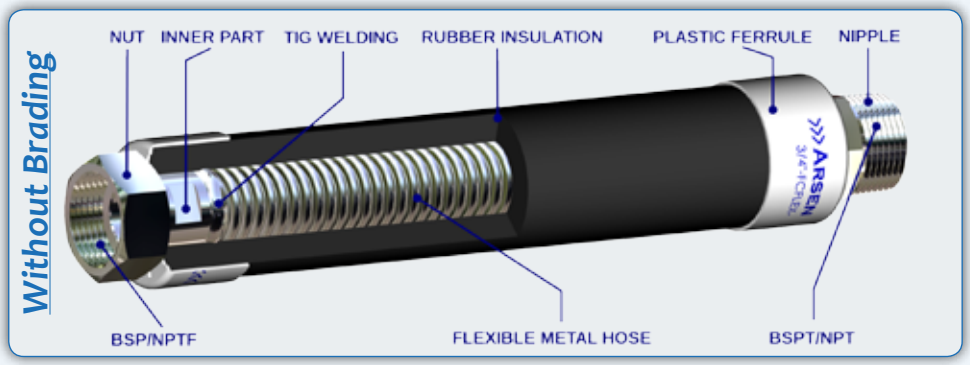
Hose Inside Diameter / ***Connection Diameter***	***DN*** / ***Inch***	12 / 1/2”	16 / 3/4”	20 / 1”
Operating Pressure- Without Brading	***Bar***	9	7	4
Operating Pressure- With Brading	***Bar***	60	55	50
Static Bend Radius- Without Brading	***mm***	20	28	32
Static Bend Radius- With Brading	***mm***	50	70	90

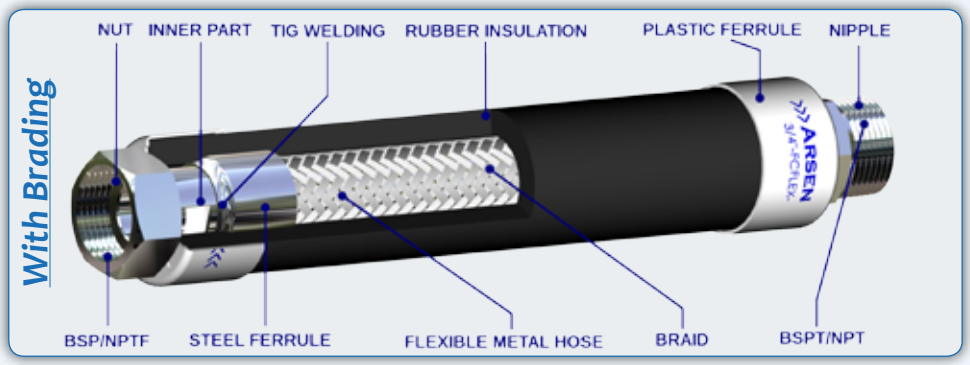
Pressure resistance values given first table above show that the hose preserves its original form without moving. When pressure applied is above these values, form of the hose begins changing in other words hose length increases. If applied pressure continues to be increased, hose looses its flexibility and leaktightness. However hoses with braiding specified in the second table below are able to keep their form and continue serving even in this high pressure conditions.

Fan Coil Hose Dimensions

Connection Diameter (inch)	1/2” - 1/2”	1/2” - 3/4”	3/4” 3/4”	3/4” - 1”	1” - 1”
Hose Diameter	12	16	16	20	20
Connection Types	Male - Female / Female - Female / Male - Male				
Lengths (mm)	The hoses can be produced in all lengths between 200 - 2000				

Fan Coil Hose Specifications



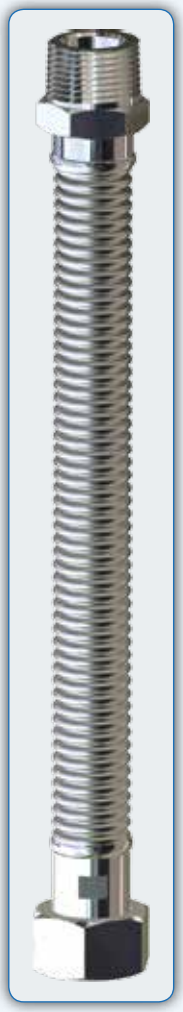


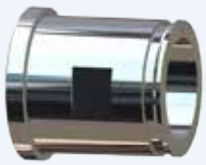
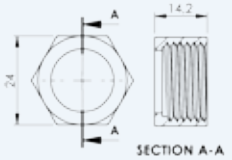
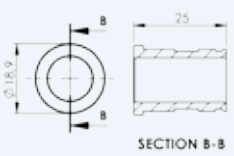
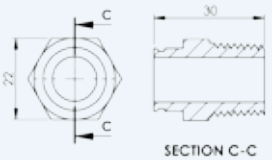
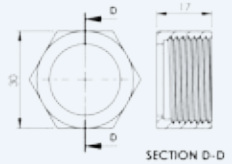
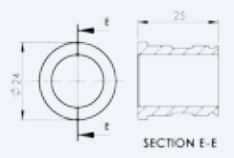
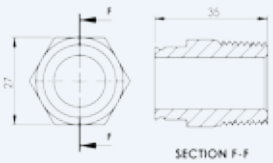
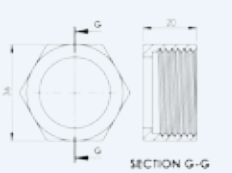
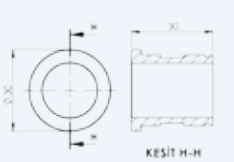
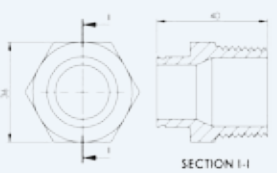
ARSEN fan-coil hoses one of the important accessories and are very practical for connecting fan-coil devices to installation lines in confined spaces. Insulation is optional and prevents possible condensation in systems.

Plastic ferrules brings in a decorative appearance and at the same time prevents the insulation material sliding from its original position and hides cut parts of insulation.

Due to difficulties of insulation after mounting the hose to system (insulation is applied without cutting in length), it is better to prefer fan coil hoses initially with insulation.

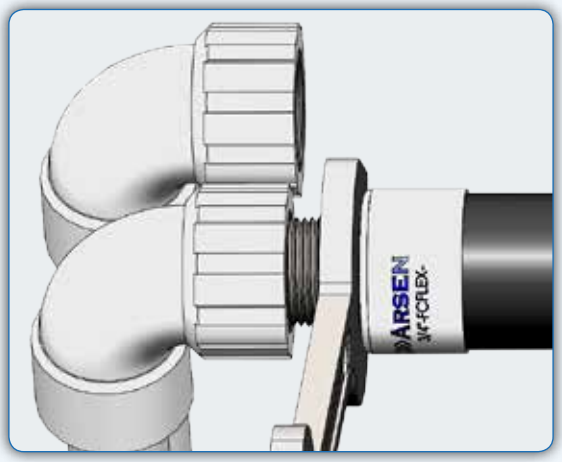
Female x Male **Female x Female** **Male x Male**



Nut Technical Drawings	Inner Part Technical Drawings	Nipple Technical Drawings
		
		
		
		

Unless otherwise requested, the connections are produced from CrNi coated carbon steel. Choosing connections made of stainless steel lengthens hose life. Male side connections are threaded according to en ISO 7/1 standard, female sides are threaded according to EN ISO 228/1 standard. For female side, nut's step on surface inside is produced flat in order to use flat seals.

Fan Coil Hoses Instalation Instructions



While mounting Fan Coil hoses, obeying instructions below extends cycle life and prevents faults resulted from incorrect installation.

It should be preferred to use appropriate additional accessories for threaded parts and be attentive for international differences. For instance, if a nipple without appropriate thread is fitted to an exported globe valve, there may be leaks through the threads.

Nipple side is to be tightened first prior to tighten the other side of hose.

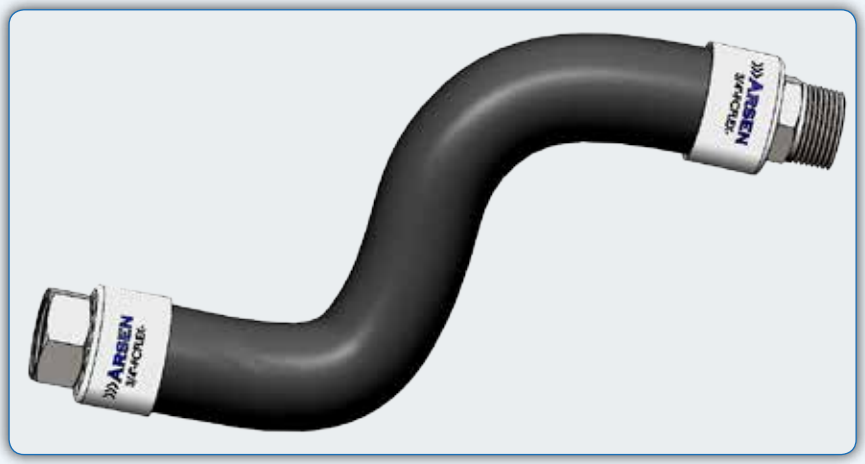
For bolt side, using a nipple in between connections eases the installation, if possible.

When mounting the female side, in order to prevent twisting of hose, hold the hexagonal area on the tail side with a wrench and then tighten the bolt. (See drawing)

Gaskets and teflon tapes should be used for threads sealing. Leak tightness is very important for connection ends. If there even is a minor leak in flat parts with seals or threaded parts, this causes rust to accumulate and harms the material in time. Even if stainless steel is used for those parts, dust will harm the protective surface on stainless steel and shortens life time.

Hose should not be connected when stretched and should not be bended near welding points. Installations as shown on left drawing shortens hose life and causes leaks in a short time period due to force on welding points.

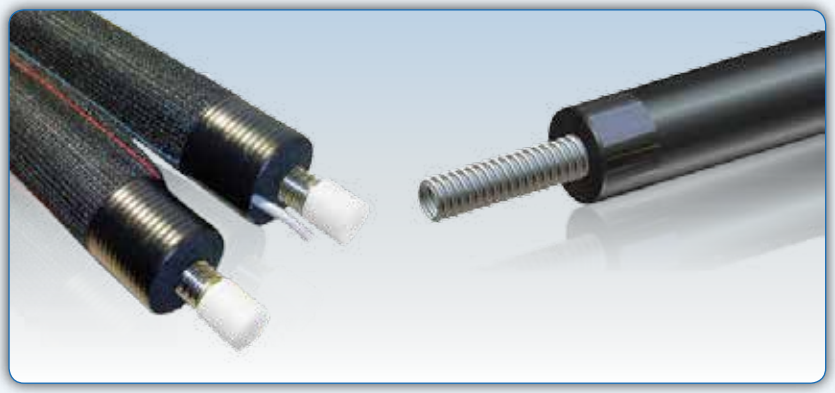
An example of correct bending is below.



IT IS STRONGLY RECOMMENDED THAT PERSONNEL INVOLVED IN INSTALLATION OF FAN COIL HOSES REVIEW THIS INSTALLATION INSTRUCTIONS.

SOLAR HOSES

ARSENFLEX®



Arsenflex Solar Energy System Hoses are a modern solution for solar panel installations designed to get hot water using solar energy. In order to reduce difficulties of determining needed hose lenghts and using beforehand manufactured hoses during installations, Arsenflex Solar System Hoses are produced either single or double insulated according to customer demands and shipped in coils of 10 to 50 meters.

Dimensions and Operating Conditions of Solar System Hoses

DN		Inner Dia.	Outside Dia.	Tol. (±)	Static Bend Radius	Wall Thick.	Pitch Type	Press. Rating	Surface Area	Weight
(mm)	(inch)	(mm)	(mm)	(mm)	rmin (mm)	(mm)	(Pitch)	(bar)	(m²/m)	(kg/m)
12	1/2"	12.4 12.0	16.7 16.7	0.20	19	0.15	Wide Standard	16 9	0.07 0.09	0.09 0.11
16	5/8"	16.6 16.2	22.0 21.8	0.20	25	0.18	Wide Standard	10 7	0.10 0.12	0.14 0.17
20	3/4"	20.3 20.0	26.0 26.7	0.20	30	0.20	Wide Standard	10 4	0.12 0.17	0.16 0.22
25	1"	25.6 25.4	31.7 32.3	0.20	35	0.20	Wide Standard	8 3	0.15 0.20	0.24 0.35

Also to ease making the connection from collector temperature sensor to control unit, a double-tipped silicon cable is attached besides the hose and insulation. Especially in external environments, preferring hoses with insulating prevents energy and heat losses which are extremely important for the whole system.

1 in 1 Single Insulated

2 in 1 Double Insulated

2 in 1 Double Insulated

Hose Diameters: DN12 / 16 / 20 / 25
Hose Lengths: 10/15/20/25/50 m
Insulation Thickness: 9/13/19 mm
Hose Type: Wide / Standard Pitch

Hose Material: AISI 316L / 304L SS
Outside Braid Material: Polyamid
Insulation Material: EPDM
Cable Material: Silicon

Quick Connection Techniques / Dimensions

It is quite important to use an easy and quick connection technique for hose installations in solar energy systems.

This provides cost savings by reducing workmanship costs besides providing products at a good cost.

Because no handiness is required for mounting hoses and connection parts we produce, it is quite easy for anyone without experience.

Material Specifications

Hose: AISI 316 L/ 304L S.Steel
Ring: AISI 304 Stainless Steel
Fittings: MS58 Brass
Seal: Klingerite without Asbestos

Hose Diameter	Fitting Diameter	Inner Dia.	Outside Dia.	Tol. (±)	Kit Hose Length	Kit Part Qty.	Pressure Rating	Temp. Rating
DN12 / 1/2"	1/2"	12.4	16.7	0.20	25 m	10 pcs of Nut Ring Seal	16	150 °C
DN16 / 5/8"	3/4"	16.6	22.0	0.20	20 m		10	150 °C
DN20 / 3/4"	1"	20.3	26.0	0.20	15 m		6	150 °C
DN25 / 1"	11/4"	25.6	31.7	0.30	10 m		5	150 °C

BOILER HOSES

ARSENFLEX®

Boilers are devices in solar heated hot water systems in order to finally heat the usage water by heating the water in solar collectors and circulating through flexible metal hoses located in a tank and used as serpentine. Due to pressurization problems and freezing events that take place in systems which usage water is the same with the water circulating in the collector system, hot water systems with boilers are advantageous comparing with the systems without boilers which usage water is directly heated.

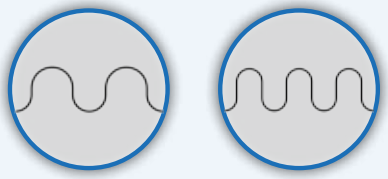
Using flexible metal hoses as serpentine in boilers has many advantages as efficiency resulted from high surface area comparing to steel pipes, installation ease for their flexibility and high corrosion resistance of stainless steel to corrosion and lime.

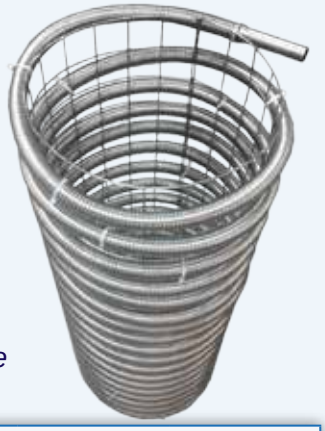
Lengths and inlet - outlet connections of Arsenflex Boiler System Hoses are produced according to needs of boiler manufacturers and shipped in a stainless steel framework either as single or double serpentine when needed. Arsen creates solutions for stainless steel frameworks according to customer demands.

Material Specifications

Hose: AISI 316 L/ 304L Stainless Steel
Connections: AISI 316 / 304 Stainless Steel

General Dimensions and Operating Conditions	
Hose Dimensions	1/2" - 2" (DN12-DN50)
Fitting Dimensions	3/8" - 21/2" (Inner or Outer Threads, Several Lenghts)
Temperature Rating	-270 / +600 °C
Pressure Rating	8 - 20 bar





Boiler connection hoses are produced either wide or standard pitch according to pressure rating.

Though AISI 316L is usually preferred as raw material because of its high corrosion resistance, they may also be produced from AISI 304L stainless steel.

Boiler Hose Dimensions

DN		Inner Dia.	Outside Dia.	Tol. (±)	Static Bend Radius	Wall Thick.	Pitch Type	Pressure Rating	Surface Area	Weight
(mm)	(inch)	(mm)	(mm)	(mm)	rmin (mm)	(mm)	(Pitch)	(bar)	(m²/m)	(kg/m)
12	1/2"	12.4 12.0	16.7 16.7	0.40	19	0.15 0.30	Wide Standard	16 20	0.07 0.08	0.09 0.19
16	5/8"	16.6 16.1	22.0 21.8		25	0.18 0.30	Wide Standard	10 16	0.10 0.11	0.14 0.28
20	3/4"	20.3 20.0	26.0 26.7		30	0.20 0.30	Wide Standard	10 16	0.12 0.16	0.16 0.39
25	1"	25.6 25.4	31.7 32.3		35	0.20 0.30	Wide Standard	8 12	0.15 0.20	0.24 0.48
32	11/4"	34.3	40.8		50	0.30	Standard	10	0.23	0.55
40	11/2"	40.0	49.5		55	0.40	Standard	9	0.29	0.94
50	2"	49.8	59.8		60	0.40	Standard	8	0.37	1.19

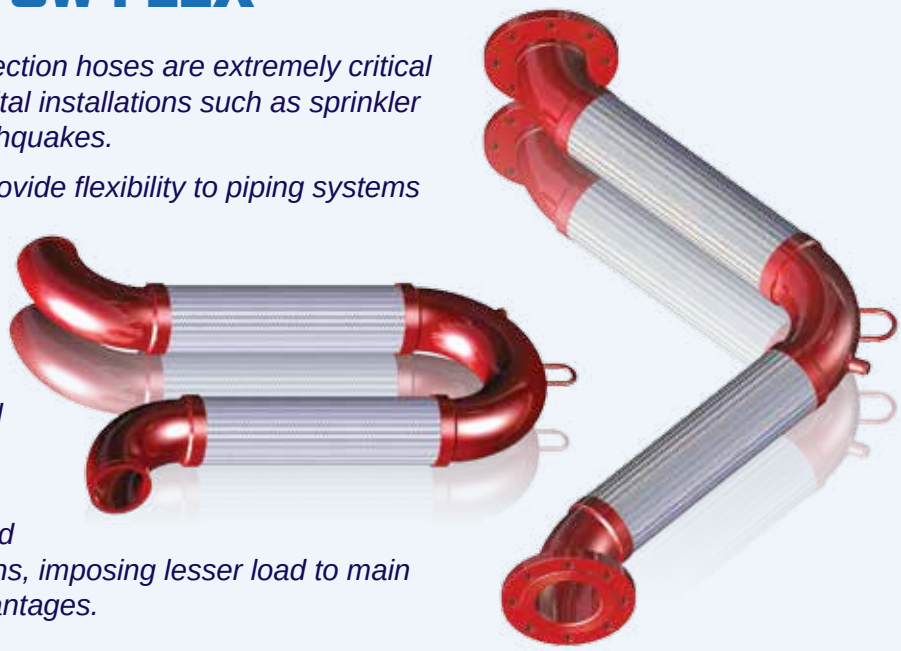
SEISMIC OMEGA (LOOP) CONNECTION HOSES
U-FLEX / V-FLEX / UW-FLEX

ArsenFlex-Loop seismic omega connection hoses are extremely critical accessories and used for protecting vital installations such as sprinkler systems from seismic motion like earthquakes.

Seismic Omega Connection Hoses provide flexibility to piping systems and used to absorb possible seismic movements in three axis.

In addition to seismic protection, installation cost is lower comparing to conventional expansion joints considering lesser need for space and fixing points and ability for nested installations.

Comparing to use expansion joints and conventional piping to absorb vibrations, imposing lesser load to main pipeline is one of their significant advantages.

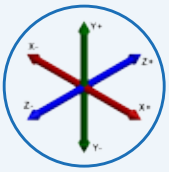


Product Specifications

Nominal Diameter: DN25 (1”) - DN200 (8”)
Operating Pressure: 16 Bar
Operating Temp.: -80 ºC - +600 ºC
Connection Types: Flanged, Welding Neck, Grooved, Threaded

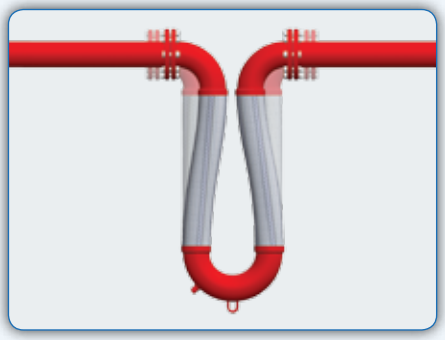
Material Specifications

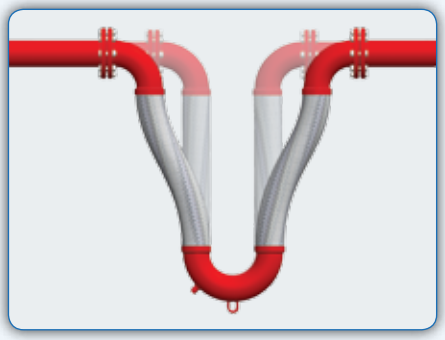
Hose: AISI 321 / 316L Stainless Steel
Wire Braid: AISI 304 Stainless Steel
Connections: Carbon Steel / Stainless Steel (Op.)



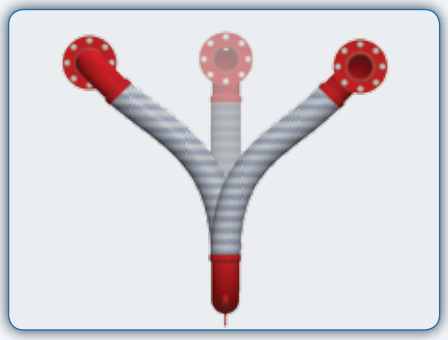
XYZ Axes The Details of Movement Abilities

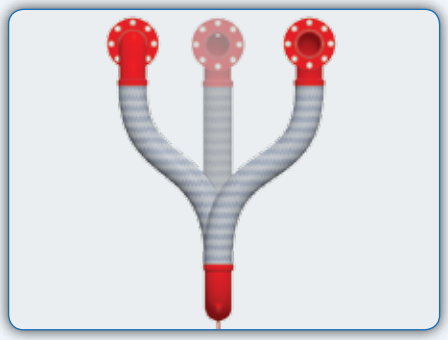
Axial Compression
Axial Extension (± 50 / ± 100)



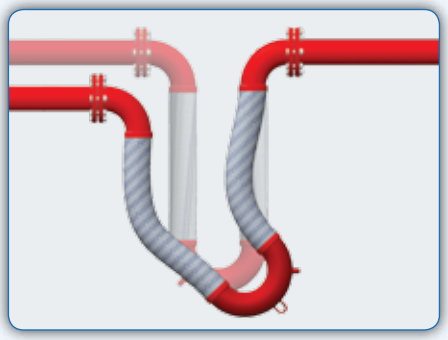


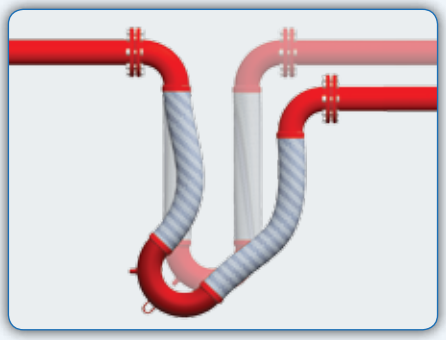
X / Z Axis Movements
(± 50 / ± 100)



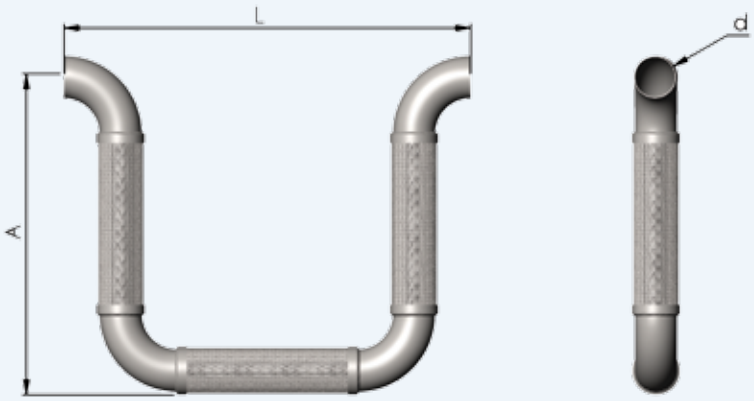


Y Axis Movements
(± 50 / ± 100)





UW-Flex Explanations



Arsen UW-Flex Loop seismic omega connection are designed as a safe connection accessory in order to protect pipelines against erratic large motions caused by earthquakes.

Trying to protect pipelines by using large omegas or conventional large expansion joints causes material or workmanship losses.

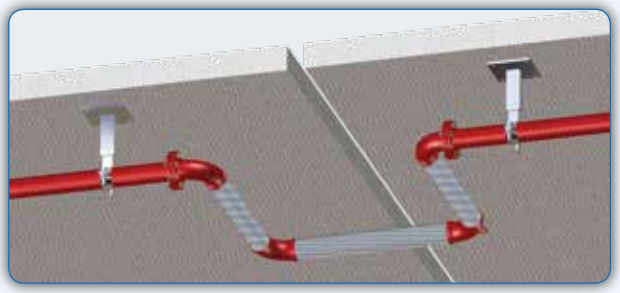
In addition to U-Flex and V-Flex, flexibility is enhanced in UW-Flex hoses and especially in nested connections, flexibility losses are minimized resulted from using long pipes.

UW-Flex Dimensions and Movements

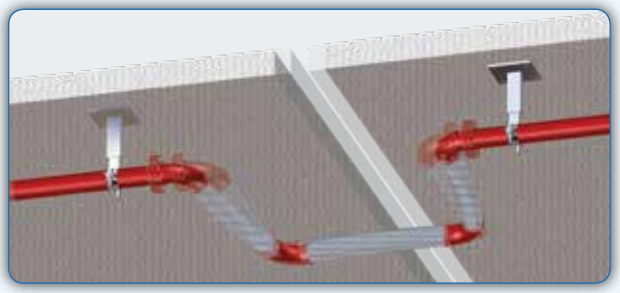
DN		Movements (±) 50mm (X,Y,Z)				Movements (±) 100mm (X,Y,Z)			
(mm)	(inch)	A (mm)	L (mm)	Tol. (mm)	d (mm)	A (mm)	L (mm)	Tol. (mm)	d (mm)
025	1"	380	520	± 5	33.7	500	640	± 5	33.7
032	11/4"	440	620	± 5	42.4	550	740	± 5	42.4
040	11/2"	470	670	± 5	48.3	600	800	± 5	48.3
050	2"	540	770	± 5	60.3	690	920	± 5	60.3
065	21/2"	600	870	± 10	76.1	750	1010	± 10	76.1
080	3"	680	980	± 10	88.9	830	1120	± 10	88.9
100	4"	800	1210	± 10	114.3	980	1380	± 10	114.3
125	5"	1010	1520	± 10	139.7	1250	1770	± 10	139.7
150	6"	1100	1690	± 10	168.3	1330	1940	± 10	168.3
200	8"	1300	2100	± 10	219.1	1550	2360	± 10	219.1

The Seismic Abilities to Move

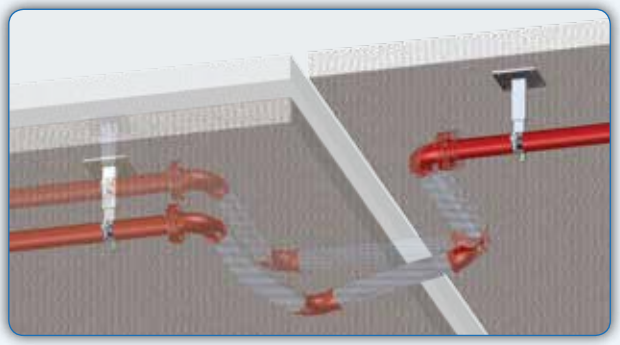
Seismic Connection Position



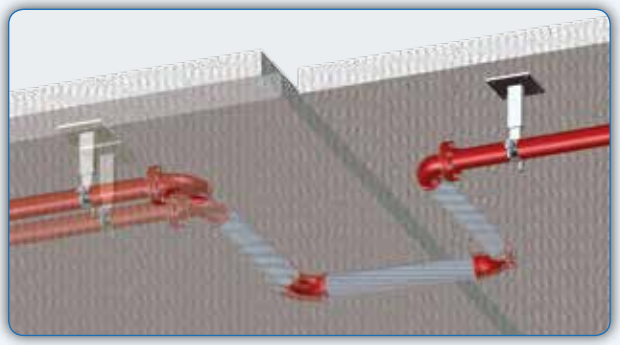
Seismic Horizantal Displacement



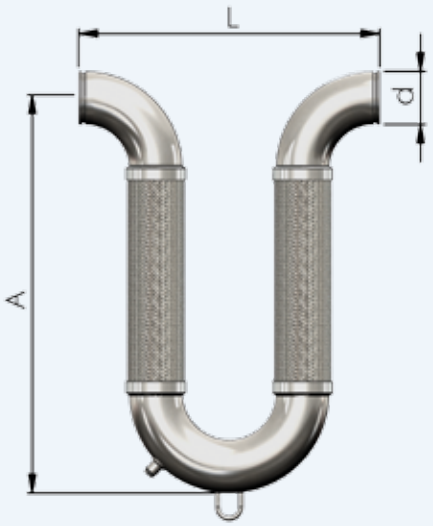
Seismic Vertical Displacement

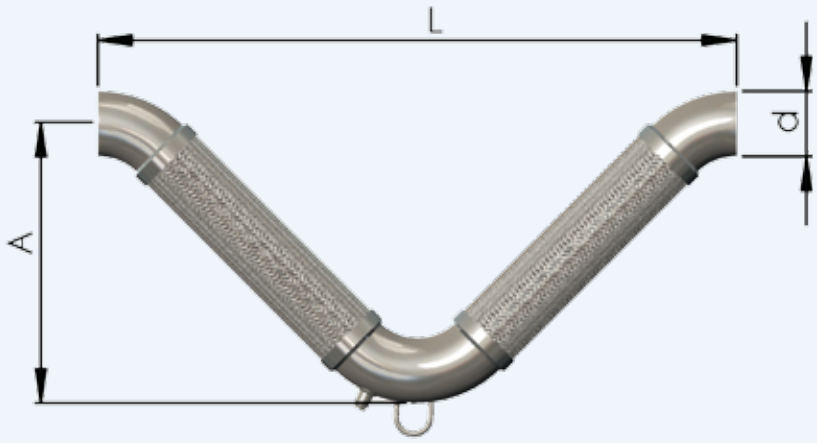


Seismic Z Axis Displacement



U-Flex / V-Flex Dimensions and Movement Details





U-Flex

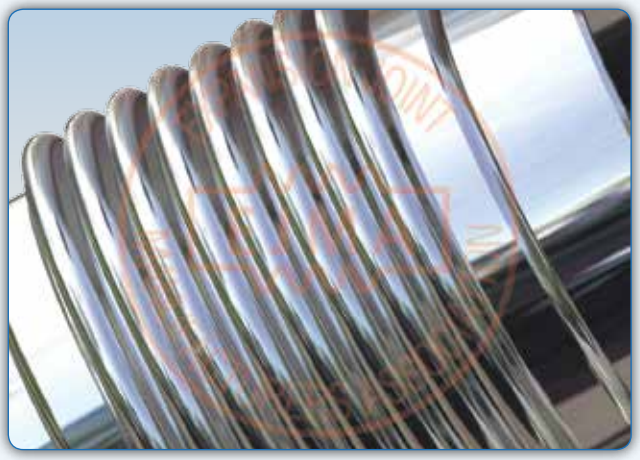
DN		Movements (±) 50mm (X,Y,Z)				Movements (±) 100mm (X,Y,Z)			
(mm)	(inch)	A (mm)	L (mm)	Tol.(mm)	d (mm)	A (mm)	L (mm)	Tol.(mm)	d (mm)
025	1"	370	155	± 5	33.7	500	225	± 5	33.7
032	11/4"	400	190	± 5	42.4	530	255	± 5	42.4
040	11/2"	430	230	± 5	48.3	580	295	± 5	48.3
050	2"	490	310	± 5	60.3	630	325	± 5	60.3
065	21/2”	550	380	± 10	76.1	710	405	± 10	76.1
080	3”	600	460	± 10	88.9	760	460	± 10	88.9
100	4"	730	620	± 10	114.3	890	620	± 10	114.3
125	5"	830	780	± 10	139.7	1020	780	± 10	139.7
150	6"	960	920	± 10	168.3	1170	920	± 10	168.3
200	8"	1240	1230	± 10	219.1	1470	1240	± 10	219.1

V-Flex

DN		Movements (±) 50mm (X,Y,Z)				Movements (±) 100mm (X,Y,Z)			
(mm)	(inch)	A (mm)	L (mm)	Tol.(mm)	d (mm)	A (mm)	L (mm)	Tol.(mm)	d (mm)
025	1"	240	510	± 5	33.7	320	660	± 5	33.7
032	11/4"	270	570	± 5	42.4	360	740	± 5	42.4
040	11/2"	330	700	± 5	48.3	410	850	± 5	48.3
050	2"	350	760	± 5	60.3	460	980	± 5	60.3
065	21/2”	420	920	± 10	76.1	540	1150	± 10	76.1
080	3”	520	1130	± 10	88.9	600	1290	± 10	88.9
100	4"	550	1230	± 10	114.3	640	1400	± 10	114.3
125	5"	680	1530	± 10	139.7	700	1550	± 10	139.7
150	6"	760	1730	± 10	168.3	830	1840	± 10	168.3
200	8"	850	1990	± 10	219.1	960	2160	± 10	219.1

EXPANSION JOINTS

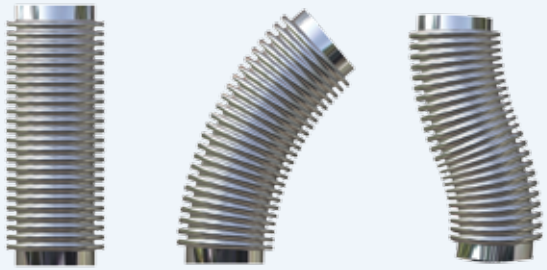
ARSENFLEX®



Expansion Joints are bellows flexible connection accessories used for absorbing thermal motions caused by ambient or transferring fluid temperature, angular motions originated from seismic events or land subsidence and any vibrations occurs in installations.

Expansion Joints have stainless steel bellows (undulation) formed hydraulically as a main part and are used in many applications such as industry and buildings with addition of limit rods, cranks and liners.

Axial **Angular** **Lateral**



Metal Expansion Joint Product Specifications

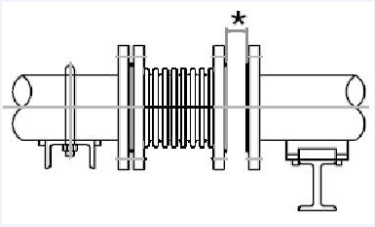
Bellow Material:	AISI 304 Stainless Steel (Op.: 316L/Ti, 309)
Liner Material:	AISI 304 Stainless Steel (Op.: 316L/Ti, 309)
Connections:	Carbon Steel - Stainless Steel (Op.)
Nominal Diameter:	DN25 (1") - DN1200 (48")
Operating Pressure:	2,5 Bar - 64 Bar
Operating Temp.:	-80 ºC - +550 ºC
Connection Types:	Floating Flanged, Fixed Flanged, W.Neck
Design:	According to the EJMA Standards

Expansion lengths vary according to the temperature at the time of installation. In the table below, expansion lengths of carbon steel and stainless steel materials. If temperature at the time of installation is below or above 20 °C, difference from operating temperature either added or subtracted from the value using the values within table.

Example :

Let us assume a pipeline installation made of carbon steel in 100 meters length carrying steam at a temperature of 125 °C. In this case axial expansion is:

1. If installation temperature is 20°C : 1.26x100=126mm
2. If installation temperature is 0°C :1.48x100=148mm
3. If installation temperature is 35°C : 1.09x100=109mm



Proper pretensioning should be applied to expansion joints according to the examples below. For expansion joints with large diameters or with welded necks, this process can be done easily by placing puller or stretchers on welded necks.

Formula :

Pretensioning Value (*) = 0,5 [ΔLTmax – ΔLTmin – 0,5(-ΔL)]

Example:

Material: Carbon Steel
Dia. of Carbon Steel Pipe: DN100 / Pipe Length: 50m
Min. Op. Temperature: 0 °C / Max. Op. Temperature : 100 °C

0 °C Expansion Length = - 0.22 mm/mt x 50 mt = -11.00 mm
100 °C Expansion Length = +0.96 mm/mt x 50 mt = +48.00 mm
Total Expansion = 48.00 +11.00 = 59.00 mm
By selecting a moving 60mm (-40/+20mm) expansion joint:

Pretensioning Value (*) = 0.5 [ΔLTmax – ΔLTmin – 0.5(-ΔL)]
Pretensioning Value (*) = 0.5 [48.00 – 11.00 – 0.5x37] = 9.25 mm

Temperature		Thermal Expansion	
C°	F°	Carbon Steel (mm/m)	Stainless Steel (mm/m)
-50	-58	-0.75	-1.13
-25	-13	-0.49	-0.74
0	32	-0.22	-0.33
25	77	0.05	0.08
50	122	0.34	0.50
75	167	0.64	0.93
100	212	0.95	1.36
125	257	1.26	1.80
150	302	1.58	2.24
175	347	1.91	2.69
200	392	2.25	3.14
225	437	2.60	3.59
250	482	2.95	4.05
275	527	3.32	4.51
300	572	3.69	4.98
325	617	4.07	5.45
350	662	4.46	5.92
375	707	4.86	6.40
400	752	5.26	6.90
425	797	5.68	7.39
450	842	6.10	7.89
475	887	6.52	8.38
500	932	6.94	8.89

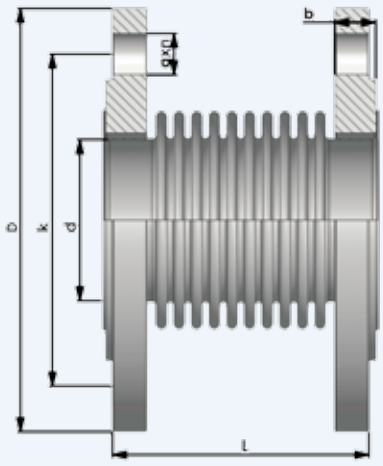
Axial Expansion Joints - Flanged (Floating/Fixed) and Welding Neck

Axial Expansion Joints are flexible accessories designed for absorbing dimension changes occurred due to temperature differences or existing vibrations in pipelines.

With the option of liner installation, vibrations that may result from high fluid flows and material erosion that erosive fluids may cause on surface of bellows is prevented from happening.

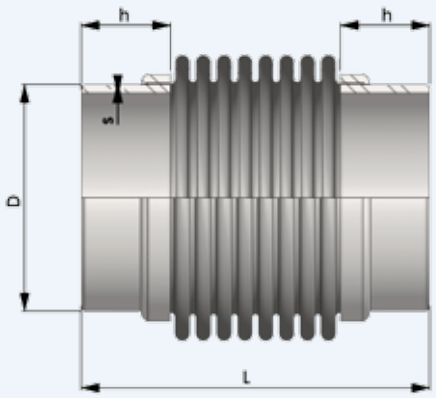
Material Specifications

Bellow: AISI 304 Stainless Steel
Flanges / Pipes: Carbon Steel - Stainless Steel (Op.)
Liner (Optional): AISI 304 Stainless Steel



Expansion Joints With Floating and Fixed Flanges Dimensions And Movements

Diameter		L(mm) Expansion (mm)			D	d	k	b	n	q	Effective Area (cm²)	Operating Pressure
DN	Inch	30	45	60								
25	1"	110	-	-	115	43	85	18	4	14	18	
32	11/4"	110	-	-	140	43	100	18	4	18	18	
40	11/2"	120	150	-	150	49	110	18	4	18	22	
50	2"	120	150	-	165	61	125	18	4	18	36	
65	21/2"	120	150	180	185	77	145	18	4	18	58	
80	3"	120	150	180	200	89	160	20	8	18	78	16 Bar
100	4"	120	150	185	220	115	180	20	8	18	124	
125	5"	125	155	190	250	140	210	22	8	18	180	
150	6"	130	155	200	285	169	240	22	8	22	252	
200	8"	150	190	230	340	220	295	24	12	22	430	
250	10"	165	205	245	405	274	355	26	12	26	660	



Expansion Joint With Welding Necks Dimensions And Movements

Diameter		L(mm) Expansion (mm)			D	s	h	Effective Area (cm²)	Operating Pressure
DN	Inch	30	45	60					
25	1"	180	-	-	33.7	2.6	50	18	
32	11/4"	180	-	-	42.4	3.2	50	18	
40	11/2"	190	220	-	48.3	3.2	50	22	
50	2"	185	215	-	60.3	3.6	50	36	
65	21/2"	185	215	240	76.1	3.6	50	58	
80	3"	185	215	245	88.9	4.0	50	78	16 Bar
100	4"	200	230	265	114.3	4.5	60	124	
125	5"	200	230	265	139.7	5.0	60	180	
150	6"	245	270	315	165.0	5.0	80	252	
200	8"	265	305	340	219.1	4.5	80	430	
250	10"	310	360	395	273.0	5.6	100	660	

Externally Pressurized Expansion Joints - Flanged / Welding Neck

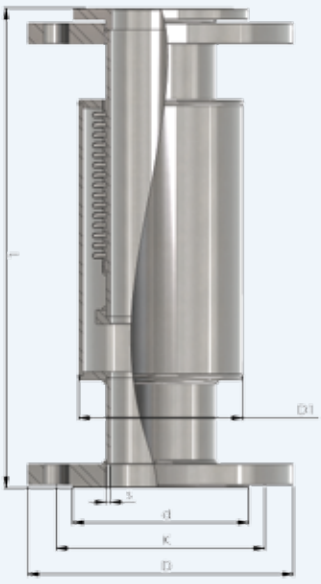
Externally Pressurized Expansion Joints are preferred in long pipelines in order to use less number of expansion joints used and to reduce number of fixed points and roller bearing that increase installation costs. Resulted from the design of bellows part that protect the axis and increase pressure resistance, risk of twisting effect is minimized and working opportunity in high pressure environments is obtained. Also these are used for absorbing expansions and contractions that occur in underground applications. Additionally they are favourable to be used for fluids like boiling oil in which high safety factors are preferred.

Material Specifications

Bellow:	AISI 304 Stainless Steel
Flanges / Pipes:	Carbon Steel - Stainless Steel (Op.)
Optional:	Complete Stainless Steel

Externally Pressurized Expansion Joint With Welding Necks Dimensons And Movements

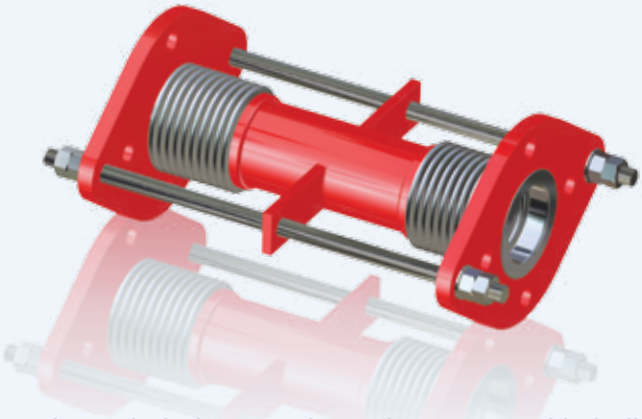
Diameter		L(mm) Expansion (mm)				D	d	s	Effective Area (cm²)	Operating Pressure
DN	Inch	30	60	90	120					
25	1"	275	395	520	-	88.9	33.7	3.2	54	40 Bar
32	11/4"	285	405	530	-	88.9	42.4	3.2	54	
40	11/2"	295	415	535	-	88.9	48.3	3.2	54	
50	2"	300	420	555	710	114.3	60.3	3.6	89	
65	21/2"	315	430	560	715	114.3	76.1	3.6	91	
80	3"	315	435	585	725	139.7	88.9	4.0	141	25 Bar
100	4"	320	450	585	750	165.0	114.3	4.5	196	
125	5"	335	465	595	765	219.1	139.7	5.0	272	
150	6"	345	475	615	790	219.1	165.0	5.0	346	
200	8"	395	520	685	860	323.9	219.1	4.5	572	
250	10"	420	585	760	950	355.6	273.0	5.6	829	



Externally Pressurized Expansion Joint With Flanged Dimensons And Movements

Diameter		L(mm) Expansion (mm)				D	K	d	D1	s	Effective Area (cm²)	Operating Pressure
DN	Inch	30	60	90	120							
25	1"	275	395	520	-	115	85	68	88.9	3.2	54	40 Bar
32	11/4"	285	405	530	-	140	100	78	88.9	3.2	54	
40	11/2"	295	415	535	-	150	110	88	88.9	3.2	54	
50	2"	300	420	555	710	165	125	102	114.3	3.6	89	
65	21/2"	315	430	560	715	185	145	122	114.3	3.6	91	
80	3"	315	435	585	725	200	160	138	139.7	4.0	141	25 Bar
100	4"	320	450	585	750	235	190	162	165.0	4.5	196	
125	5"	335	465	595	765	270	220	188	219.1	5.0	272	
150	6"	345	475	615	790	300	250	218	219.1	5.0	346	
200	8"	395	520	685	860	360	310	285	323.9	4.5	572	
250	10"	420	585	760	950	425	370	345	355.6	5.6	829	

Universal Tied Expansion Joints - Flanged / Welding Neck



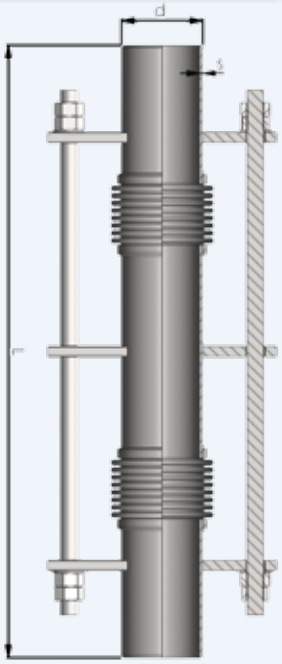
Universal Tied Expansion Joints are used in buildings with different construction foundations. They are installation accessories in order to absorb large lateral motions resulted from subsidence and ground motion. Thus, pipelines are prevented from damage after possible motions.

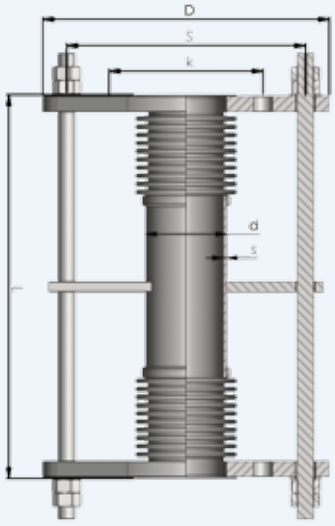
Material Specifications

1	Below	AISI 304 Stainless Steel
2	Welding Ferrule	AISI 304 Stainless Steel
3	Connection Pipe	Carbon Steel
4	Flange	Carbon Steel
5	Limit Rod	Carbon Steel
6	Rove-Nut	Carbon Steel

Universal Tied Expansion Joint With Welding Necks Dimensions And Movements

Diameter		L(mm)					d	s	Operating Pressure
		Movements (mm)							
DN	Inch	X	Y: ±25	Y: ±50	Y: ±75	Y: ±100			
25	1"	30	550	650	750	850	33.7	3.2	16 Bar
32	11/4"	30	550	650	750	850	42.4	3.2	
40	11/2"	30	550	650	750	850	48.3	3.2	
50	2"	30	620	720	820	920	60.3	3.6	
65	21/2"	60	620	720	820	920	76.1	3.6	
80	3"	60	670	770	870	970	88.9	4.0	
100	4"	60	670	770	870	970	114.3	4.5	
125	5"	60	710	910	1010	1110	139.7	5.0	
150	6"	60	710	910	1010	1110	165.0	5.0	
200	8"	60	760	960	1050	1160	219.1	4.5	
250	10"	60	860	1060	1150	1260	273.0	5.6	



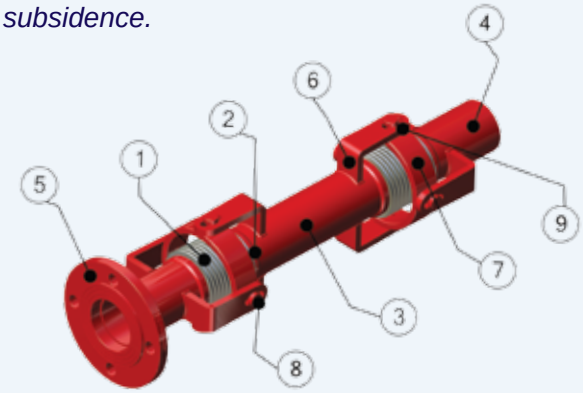


Universal Tied Expansion Joint With Flanges Dimensions And Movements

Diameter		L(mm)					D	S	k	d	s	Operating Pressure
		Movements (mm)										
DN	Inch	X	Y: ±25	Y: ±50	Y: ±75	Y:±100						
25	1"	30	260	360	460	560	185	150	85	33.7	3.2	16 Bar
32	11/4"	30	260	360	460	560	210	180	100	42.4	3.2	
40	11/2"	30	260	360	460	560	220	185	110	48.3	3.2	
50	2"	30	360	460	560	660	250	205	125	60.3	3.6	
65	21/2"	60	360	460	560	660	270	225	145	76.1	3.6	
80	3"	60	410	510	610	710	310	250	160	88.9	4.0	
100	4"	60	410	510	610	710	330	270	180	114.3	4.5	
125	5"	60	460	660	760	860	366	305	210	139.7	5.0	
150	6"	60	460	660	760	860	420	350	240	165.0	5.0	
200	8"	60	510	700	800	900	510	410	295	219.1	4.5	
250	10"	60	600	800	900	1000	573	485	355	273.0	5.6	

Gimbal Type (Seismic) Expansion Joints - Flanged / Welding Neck

Gimbal Type (Seismic) Expansion Joints are expansion joints with cranks used for absorbing axial, lateral and angular motions resulted from seismic motions (earthquakes) that occur in points with a risk of breaking. When requested absorbing capability is higher than standard values, according to application they are used, they can be designed specifically for motion values calculated by project engineer. Gimbal Type Seismic Expansion Joints are for protecting pipeline installation points and prevents them from damages resulted from seismic motions or subsidence.



Material Specifications

1	Below	AISI 304 Stainless Steel
2	Welding Ferrule	AISI 304 Stainless Steel
3	Connection Pipe	Carbon Steel
4	Welding Neck	Carbon Steel
5	Flange Collar	Carbon Steel
6	Joint	Carbon Steel
7	Joint Ferrule	Carbon Steel
8	Pin	Carbon Steel
9	Ring	Steel

Gimbal Type (Seismic) Expansion Joint With Welding Neck Dimensions And Movements

Diameter		L(mm) Movements (mm)					D	s	A	Operating Pressure
DN	Inch	X: ±50	Y: ±50	Y: ±100	Y: ±150	Y: ±200				
25	1"	100	730	930	1130	1330	33.7	3.2	90	16 Bar
32	11/4"	100	730	930	1130	1330	42.4	3.2	105	
40	11/2"	100	730	930	1130	1330	48.3	3.2	115	
50	2"	100	790	990	1190	1400	60.3	3.6	140	
65	21/2"	100	790	990	1240	1500	76.1	3.6	160	
80	3"	100	840	1040	1270	1500	88.9	4.0	190	
100	4"	100	840	1040	1300	1550	114.3	4.5	250	
125	5"	100	970	1170	1480	1770	139.7	5.0	285	
150	6"	100	970	1170	1480	1770	165.0	5.0	350	
200	8"	100	1140	1360	1710	2060	219.1	4.5	420	
250	10"	100	1140	1360	1710	2060	273.0	5.6	540	

Gimbal Type (Seismic) Expansion Joint With Flanges Dimensions And Movements

Diameter		L(mm) Movements (mm)					D	K	s	A	Operating Pressure
DN	Inch	X ±50	Y: ±50	Y: ±100	Y: ±150	Y: ±200					
25	1"	100	710	910	1110	1310	115	85	3.2	90	16 Bar
32	11/4"	100	710	910	1110	1310	140	100	3.2	105	
40	11/2"	100	710	910	1110	1310	150	110	3.2	115	
50	2"	100	770	970	1170	1380	165	125	3.6	140	
65	21/2"	100	770	970	1220	1480	185	145	3.6	160	
80	3"	100	820	1020	1250	1480	200	160	4.0	190	
100	4"	100	820	1020	1280	1530	220	180	4.5	250	
125	5"	100	950	1150	1460	1750	250	210	5.0	285	
150	6"	100	950	1150	1460	1750	285	240	5.0	350	
200	8"	100	1120	1340	1690	2040	340	295	4.5	420	
250	10"	100	1120	1340	1690	2040	405	355	5.6	540	

Technical Information for Metal Expansion Joints

The bellows parts of expansion joints are made of comparatively thin materials. Especially before welding around, product should be protected by means of wrapping the bellows part by a fireproof material in order to prevent it from clinkers or unintended impacts.

Axial expansion joints are produced only to absorb axial motions. Because of this, rolling bearings over the pipelines should be placed only to allow axial movements. On turning points, only fixed bearings should be used.

In order not to twist expansion joints, pipelines to be connected should necessarily be parallel during installation.

Calculated expansion and contraction points should be between two fixed points. One expansion joint should be placed between two anchored points and pretensioning should be applied as described below:

Waste materials that are potentially going to block movement by going into convolutions of bellows should be removed. Fluids that cause erosion on stainless steel like chlorine should not be used in cleaning.

Expansion joints are tested 1.5 times of rated pressure. While testing pipeline, maximum test pressure should not exceed this value.

Expansion joints should be protected from thermal shocks. Thermal shocks reduce expansion joint's life cycle.

Rubber Expansion Joints - Flanged

Rubber Expansion Joints are installation accessories that can absorb axial, lateral and angular motions.

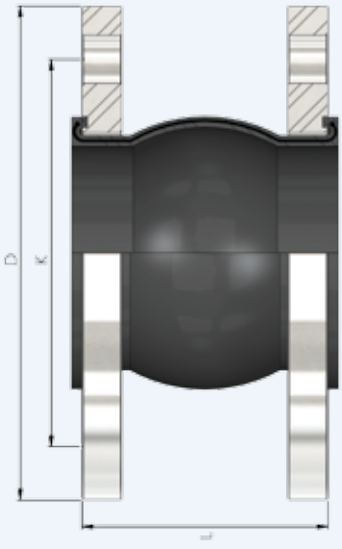
Rubber Expansion Joints are consist of rubber main body, steel wire and nylon cord reinforced special synthetic rubber.

Main advantages are easiness of installation with floating flanges, vibration and sound absorption, installation without additional need for seals.

Material Specifications	
Bellow	EPDM (Optional: NBR, NR, Viton)
Flanges	GGG40.3 Cast Iron St37 Carbon Steel (Optional: Stainless Steel)
Diameter	DN32 / DN700
Temperature	100 °C

Rubber Expansion Joint Dimensions

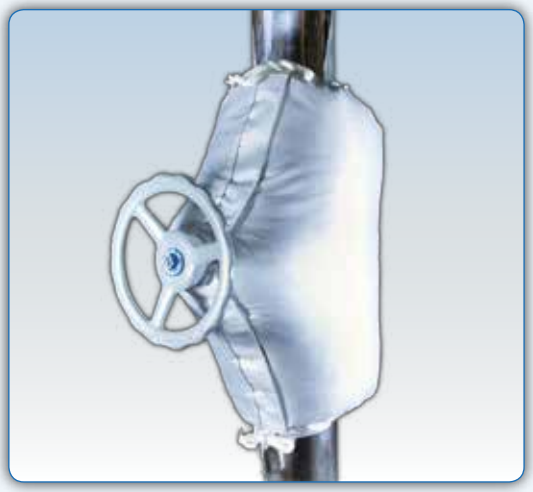
Diameter		Movements			L (mm)	D	K	Operating Pressure
DN	Inch	Axial (mm)	Lateral (mm)	Angular (°)				
32	11/4"	-10/+7	10	10	100	140	100	16 Bar
40	11/2"	-10/+7	10	10	100	150	110	
50	2"	-10/+7	10	10	100	165	125	
65	21/2"	-13/+7	12	10	100	185	145	
80	3"	-16/+9	13	10	100	200	160	
100	4"	-20/+10	14	10	100	220	180	
125	5"	-20/+12	15	10	120	250	210	
150	6"	-20/+12	15	10	120	285	240	
200	8"	-25/+15	20	10	120	340	295	
250	10"	-25/+15	20	10	130	405	355	
300	12"	-25/+15	20	10	210	460	410	



VALVE JACKETS

ARSENFLEX®

Heating Valve Jackets



Valve jackets are insulation products in order to prevent heat losses in valves used in heating systems.

Area Of Use:

-Steam Lines -Hat Oil Lines -Pumps -Heat Exchanger
-Special Applications

Advantages of Arsen Heating Valve Jackets

1. *There are no components used in structure of jackets to form a thermal bridge. (Wire, Metal Fasteners etc.)*
2. *Cloth material includes silicon and is imported from Europe. (China made clothes without silicon is not used in production.)*
3. *Our jacket templates is designed specifically to cover the valves completely.*
4. *In maintenance phase, it is possible to remove the jacket easily and use it again after maintenance. (They are not disposable like metal coatings)*

Heating Valve Jackets Installations

Wrapping the Jacket

Joining Upper Surfaces

Joining Side Surfaces

Technical Specifications

Cloth Material:	Nonflammable Cloth with Silicon Ceramic Fiber Cloth
Insulation Material:	Rock Wool Ceramic Blanket
Packthread:	Fiber Glass Rope
Dimensions:	DN 15 – DN 500
Temperature Rating:	1200 ºC (Max.)

Cooling Valve Jackets

Cooling valve jackets are insulation products in order to prevent condensation and energy losses in valves in cooling systems.

Area Of Use:

-Cooling Lines -Valves -Pumps -Pipelines
-Special Applications

Advantages of Arsen Cooling Valve Jackets

1. *Provides 100% airtightness due to special production techniques.*
2. *Removing and wrapping is quite easy because it is not fixed to cooling surfaces.*
3. *Provides protection from ambient effects due to inflammable cloth used in back side of insulation material.*
4. *Has an esthetical view and occupies least space. Easy to use every kind of confined spaces.*

Cooling Valve Jackets Installations

Wrapping the Jacket

Joining Upper Surfaces

Joining Side Surfaces

Technical Specifications

Cloth Material:	Nonflammable Cloth with Silicon
Insulation Material:	Rubber Foam
Packthread:	Cable Tie
Dimensions:	DN 15 – DN 500
Temperature Rating:	-40 /+105 ºC

NOTES

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"QUALITY ALWAYS WINS"

ARSENFLEX®