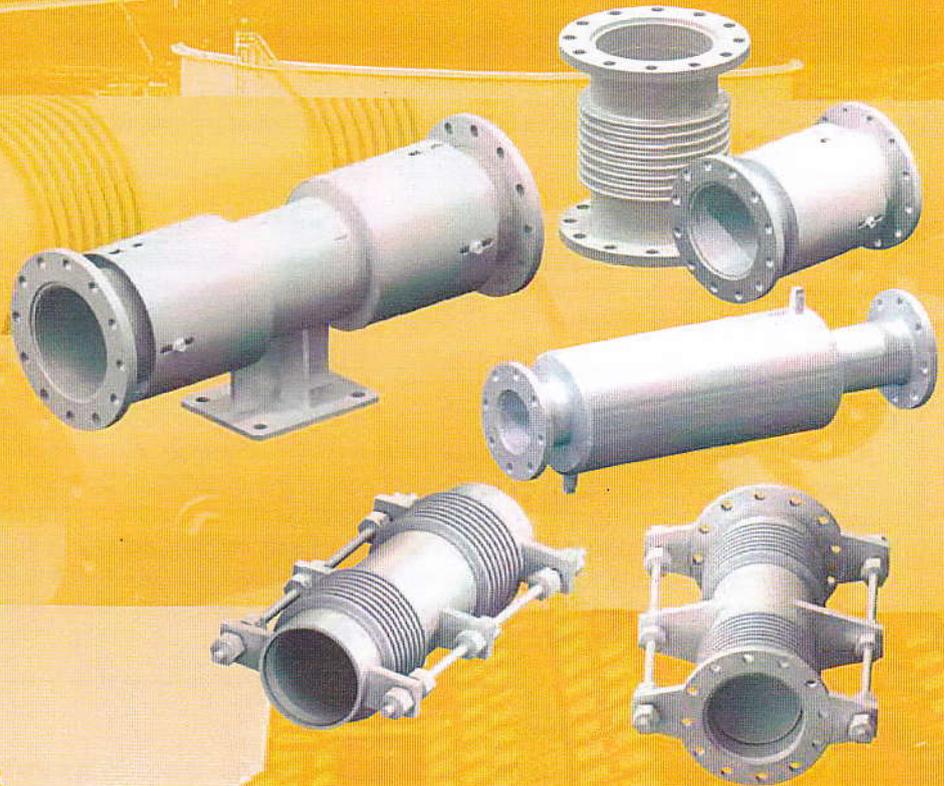


SJT series

METAL EXPANSION JOINT

S J T



SJT series

METAL EXPANSION JOINT

FEATURES

- Bellow Expansion Joints are employed in piping systems to absorb differential thermal expansion while containing the system pressure.
- Size is available from 25A (1") to 4000A (160").
- Typical working pressure varies from full vacuum to 1000 psig (66 bar) and temperature from -420°F (-215°C) to 1800°F (982°C) that refer from EJMA Organization.
- Standard design of movement and material maximizes the productivity while the custom design maximizes the suitability for special applications.
- Computer designed bellows element complies with EJMA criteria.
- All products are tested before delivery according to relevant code or ISO quality control system.

APPLICATION

- Bellows type metal Expansion Joints are successfully utilized in refineries, chemical plants, fossil and nuclear power systems, heating and cooling system, and cryogenic plants.

DEFINITION & TYPE OF EXPANSION JOINT

EXPANSION JOINT is any device containing one or more bellows used to absorb dimensional changes, such as those caused by thermal expansion or contraction of a pipeline, duct or vessel.

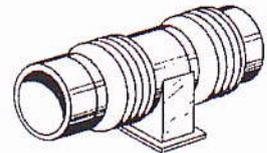
SINGLE EXPANSION JOINT

The simplest form of Expansion Joint, of single bellows construction, for the purpose of absorbing any combination of the three basic movements of the pipe section in which it is installed.



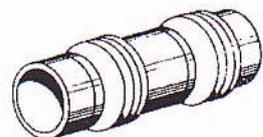
DOUBLE EXPANSION JOINT

A double Expansion Joint consists of two bellows joined by a common connector which is anchored to some rigid part of the installation by means of an anchor base. The anchor base may be attached to the common connector either at installation or at time of manufacture. Each bellows acts as a single Expansion Joint and absorbs the movement of the pipe section in which it is installed independently of the other bellows. Double Expansion Joints should not be confused with universal Expansion Joints.



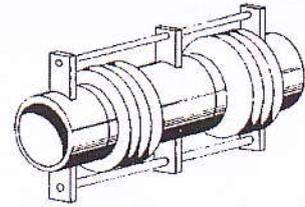
UNIVERSAL EXPANSION JOINT

A universal Expansion Joint is one containing two bellows joined by a common connector for the purpose of absorbing any combination of the three basic movements: axial movement, lateral deflection and angular rotation. Universal Expansion Joints are usually furnished with control rods to distribute the movement between the two bellows of the Expansion Joint and stabilize the common connector. This definition does not imply that only a universal Expansion Joint can absorb combined movement.



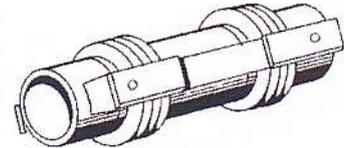
UNIVERSAL TIED EXPANSION JOINT

The tied universal Expansion Joints are used when it is necessary for the assembly to eliminate pressure thrust forces from the piping system. In this case the Expansion Joint will absorb lateral movement and will not absorb any axial movement external to the tied length.



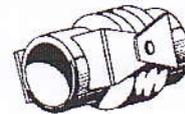
SWING EXPANSION JOINT

A swing Expansion Joint is one containing two bellows joined by a common connector designed to absorb lateral deflection and/or angular rotation in one plane. Pressure thrust and extraneous forces are restrained by the use of a pair of swing bars, each of which is pinned to the Expansion Joint ends.



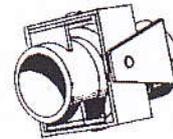
HINGED EXPANSION JOINT

A hinged Expansion Joint contains one bellows and is designed to permit angular rotation in one plane only by the use of a pair of pins through hinge plates attached to the Expansion Joint ends. The hinges and hinge pins must be designed to restrain the thrust of the Expansion Joint due to internal pressure and extraneous forces, where applicable. Hinged Expansion Joints should be used in sets of two or three to function properly.



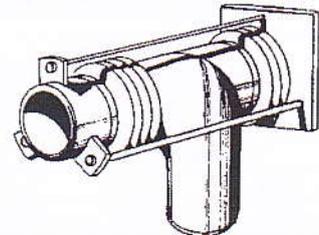
GIMBAL EXPANSION JOINT

A gimbal Expansion Joint is designed to permit angular rotation in any plane by the use of two pairs of hinges affixed to a common floating gimbal ring. The gimbal ring, hinges and pins must be designed to restrain the thrust of the Expansion Joint due to internal pressure and extraneous forces, where applicable.



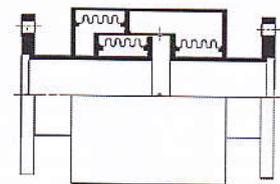
PRESSURE BALANCED EXPANSION JOINT

A pressure balanced Expansion Joint is designed to absorb axial movement and/or lateral deflection while restraining the pressure thrust by means of tie devices interconnecting the flow bellows with an opposed bellows also subjected to line pressure.



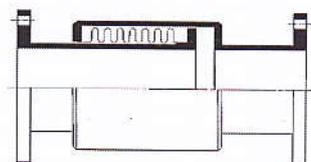
IN-LINE PRESSURE BALANCED EXPANSION JOINT

An in-line pressure balanced Expansion Joint is designed to absorb axial movement and/or lateral deflection while restraining the pressure thrust by means of tie devices interconnecting the line bellows with outboard compensating bellows also subjected to line pressure. Each bellows set is designed to absorb the axial movement and usually the line bellows will absorb the lateral deflection. This type of Expansion Joint is used in a straight run of piping.

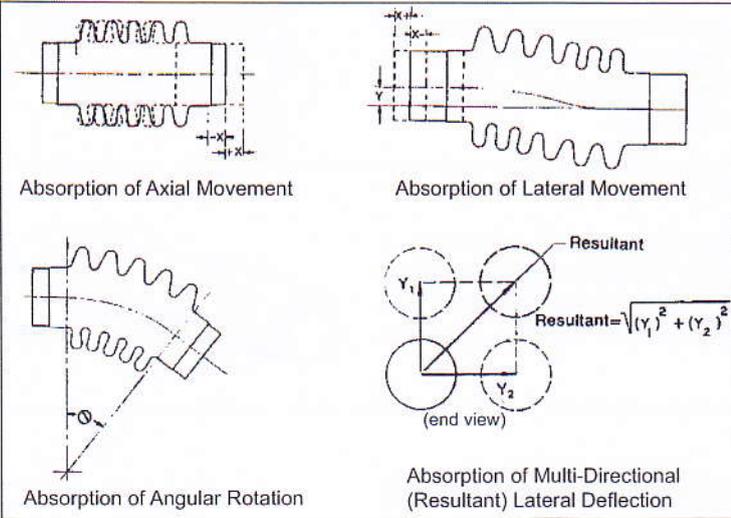


EXTERNAL PRESSURIZED EXPANSION JOINT

The external pressurized Expansion Joint is designed so that the pressure is external to the bellows whilst the inside is at atmospheric pressure and it has many convolutions to allow a large amount of axial movement. But under external pressure the bellows will retain its shape completely stable. Besides external pressure the bellows is protected from external damage by a heavy wall shroud and is isolated from flow impingement by an internal sleeve.



MOTION

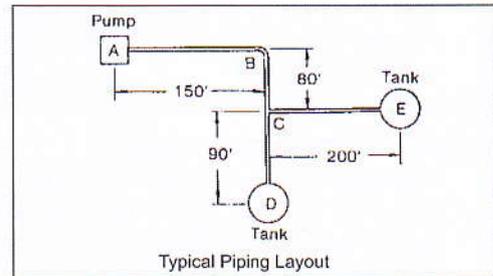


Note : Expansion Joint is not suitable for torsion or twisting movement, because such movement produces extremely high shear stresses in the bellows.

SYSTEM PREPARATION

1) Simplify the system

Survey piping system and major equipment such as turbines, pumps, compressors, fan, etc. Check the length of piping which will expand to the system.



2) Calculating thermal growth

Determining thermal movement.

$\beta\Delta t$ (Unit : mm)

Temperature changes °C	Carbon Steel SGP, STPG, STPT, STPY, STPA22 less than 3CrMo	Alloy Steel 5 CrMo to 9 CrMo	Austenitic Stainless Steel 18Cr8Ni	Copper (CuZn)	Aluminium
-198	-1.782	-1.675	-2.905	-2.922	-3.530
-180	-1.651	-1.553	-2.668	-2.675	-3.267
-160	-1.496	-1.410	-2.398	-2.397	-2.965
-140	-1.334	-1.259	-2.122	-2.111	-2.646
-120	-1.165	-1.100	-1.840	-1.824	-2.312
-100	-0.991	-0.937	-1.549	-1.532	-1.965
-80	-0.808	-0.762	-1.254	-1.249	-1.608
-60	-0.617	-0.581	-0.953	-0.954	-1.234
-40	-0.419	-0.394	-0.642	-0.647	-0.839
-20	-0.212	-0.200	-0.323	-0.327	-0.426
0	0.000	0.000	0.000	0.000	0.000
20	0.218	0.206	0.328	0.336	0.441
40	0.442	0.418	0.660	0.679	0.894
60	0.673	0.637	0.997	1.032	1.363
80	0.909	0.862	1.338	1.394	1.846
100	1.153	1.091	1.684	1.762	2.332
120	1.400	1.321	2.032	2.124	2.832
140	1.653	1.554	2.381	2.510	3.333
160	1.917	1.792	2.734	2.894	3.843
180	2.178	2.034	3.091	3.280	4.361
200	2.448	2.278	3.450	3.676	4.886
220	2.724	2.528	3.810	4.077	5.421
240	3.002	2.784	4.174	4.486	5.959
260	3.286	3.042	4.540	4.901	6.505
280	3.576	3.304	4.911	5.317	7.062
300	3.870	3.573	5.286	5.742	7.626
320	4.173	3.843	5.661	6.170	8.179

$\Delta X = L \times \beta\Delta t$

ΔX = Axial Movement (mm)

L = Length of piping (metre)

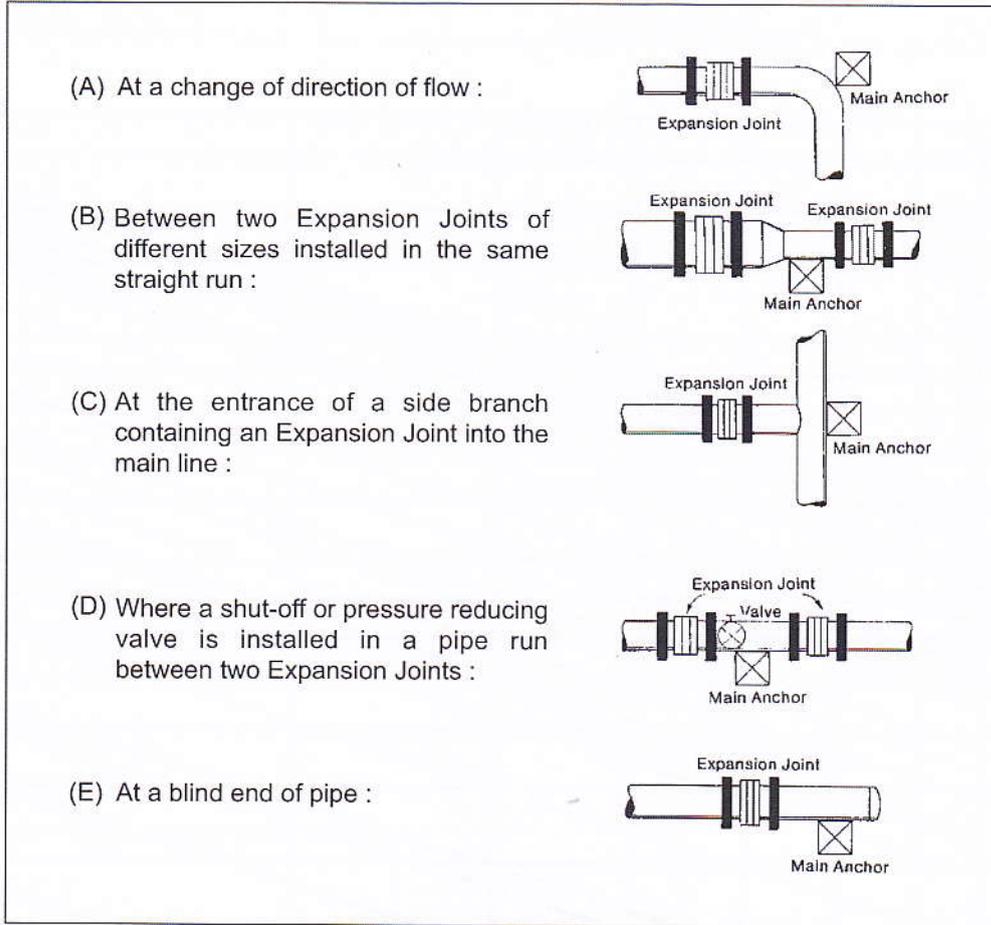
$\beta\Delta t$ = Thermal Expansion by one metre (mm/m)

3) **Pipe anchors and forces**

Must be designed to withstand all of the forces acting upon them. Two significant forces which are unique of Expansion Joint system are spring force and pressure thrust force.

● **Main Anchors**

Must be designed to withstand the forces and movements imposed upon it by each of the pipe sections to which it is installed. In systems containing Expansion Joint, main anchors are installed at any of the following locations.

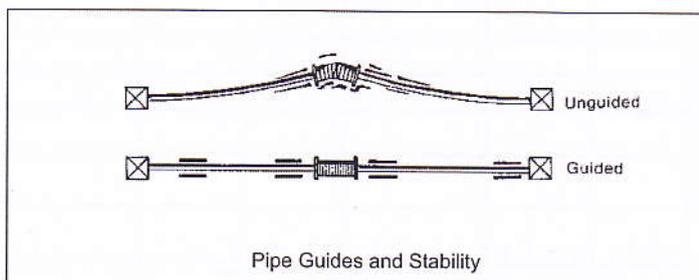


● **Intermediate Anchors**

are not intended to withstand pressure thrust force, but it withstands all of the non-pressure forces such as spring forces and frictional forces in pressure balanced or double Expansion Joint.

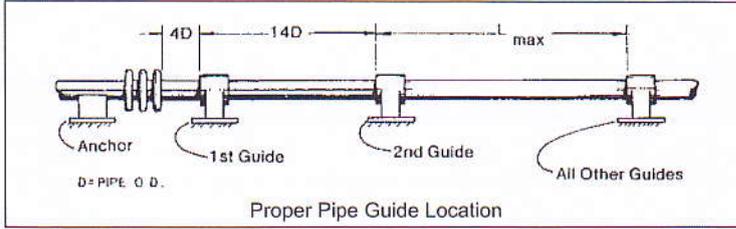
● **Pipe Guide and Support**

Pipe Guides are necessary to insure proper alignment of movement to the Expansion Joint and to prevent buckling of the line.

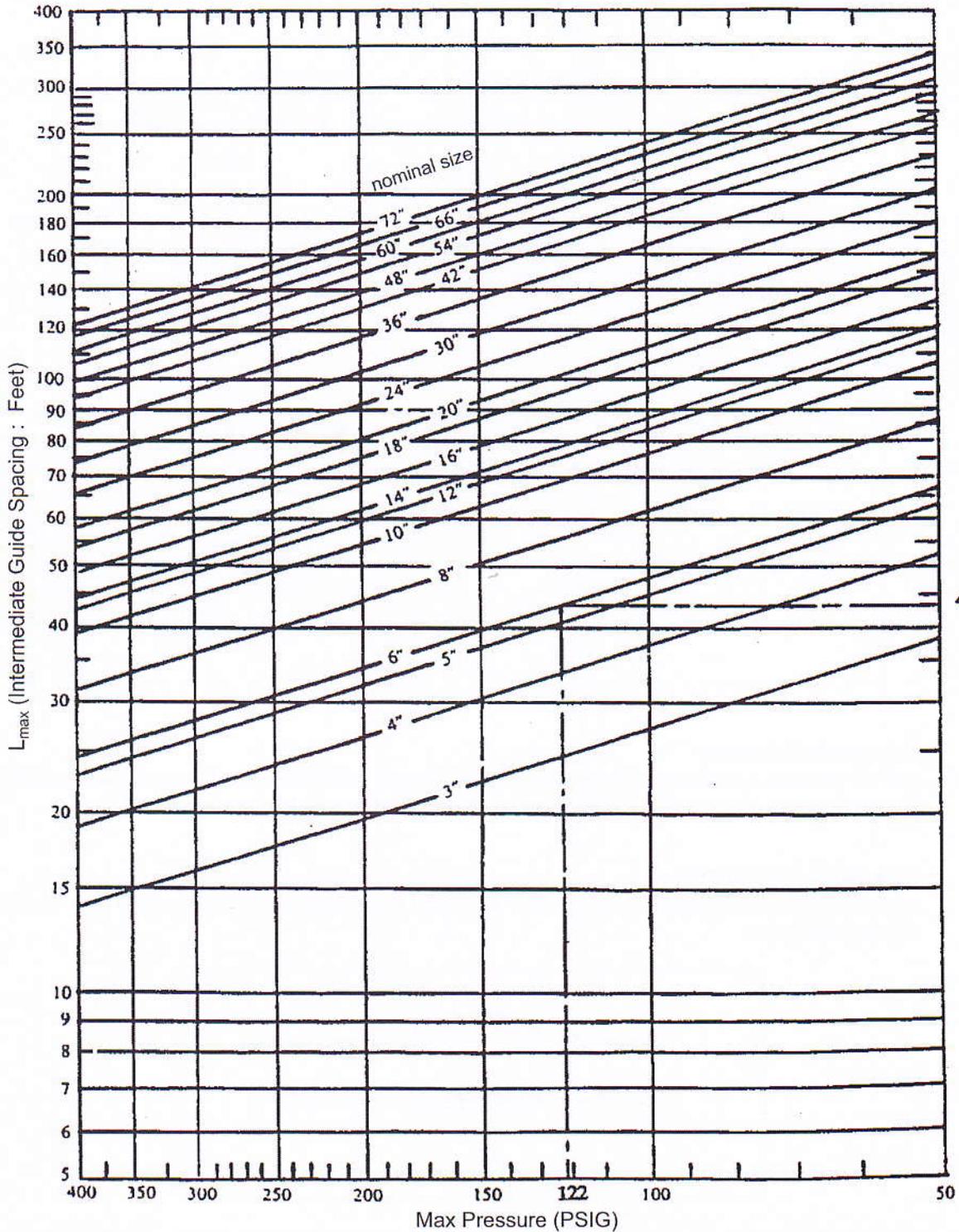


● **Pipe Guide Application**

Generally recommended that the Expansion Joint is located near an anchor, and any other guides should determine the position like below figure.



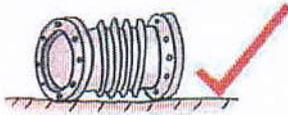
D = Nominal diameter of pipe
 L_{max} = see below graph



Guide for storage and installation

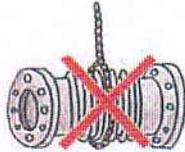
1)  Inspect damage such as dent, burr, broken, etc.

2) Store in the clean and dry area. Don't expose the joint in hazardous or corrosive environment.

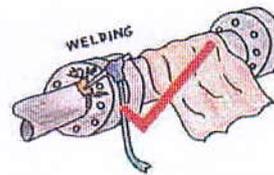


3) Never use chains or other devices directly on the bellows.

4) Don't use cleaning agents which contain chlorides.



5) Don't drop or strike Expansion Joint and beware bellows when you have welding process.



6) Don't force or rotate one end of an Expansion Joint for alignment of bolt holes because torsions may damage the joint.

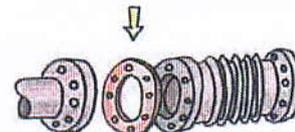
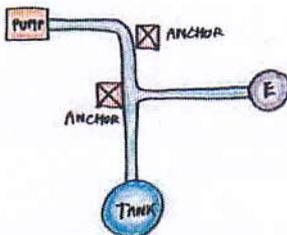
7) Check working pressure & working temperature do not exceed the limited.



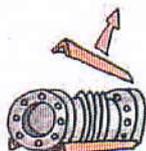
8) Check the corrective of flow direction (see arrow mark)  with fluid flow.

9) Check for adequate anchor and guide support for the system.

10) Insert gasket between Expansion Joint and counter flange.



11) Remove shipping bar after installation completed.



Note : Don't use shipping bars to restrain the pressure thrust during testing.

Installation Instruction

Expansion Joint Installation

The bellows of an Expansion Joint is manufactured from relatively thin material in order to provide the flexibility needed to absorb the specified movement. The life of the Expansion Joint can be shortened if the unit is improperly handled and/or installed. This can arise from direct physical damage to the bellows through stresses imposed during installation, or by other factors. Therefore some basic instructions must be followed having safe and proper installation of Expansion Joints.

Pipework system design

Tozen strongly recommends that you seek the advice of qualified Pipework engineer on your piping system and Expansion Joint selection. Pipework containing Expansion Joints requires careful anchoring and guiding for the Expansion Joint(s) to operate to their designed capacity.

Pipe anchors

The function of a pipe anchor is to divide the pipeline into individual expanding sections. Because thermal growth cannot be restrained, it becomes the functions of the anchors to limit and control the amount of movement which Expansion Joints located between these anchors will absorb. Sometimes equipment such as turbines, pump, compressors, heat exchanger, etc. may possibly act as anchors.

Pipe Guides

Correct alignment of the adjoining Pipework is essential in the proper functioning of an Expansion Joints. Pipe guides are necessary to ensure movement is directed onto the Expansion Joint and also to prevent buckling of the pipeline.

Receiving Inspection

Upon receipt, identify and inspect the Expansion Joints for any damage that may have occurred in transit. We recommend that the Expansion Joints be stored in a safe area in its original packaging until ready for installation. Contact Tozen immediately if any repairs should be required.

Installation Guidelines

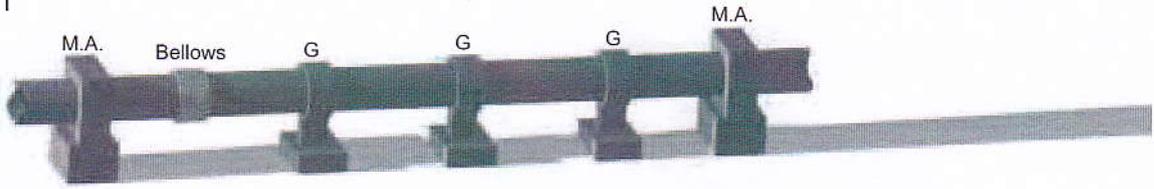
- 1) Anchors, guides, and pipe supports must be installed in strict accordance with the piping system drawing. Any field variances from the planned installation may affect the proper functioning of the Expansion Joint.
- 2) No movement or stresses shall be imposed on Expansion Joint during installation. This may occur through pipe or flange bolt hole misalignment or due to mishandling. The pressure capacity, fatigue life, and stability of the bellow may be diminished, and unanticipated forces may be imposed on the adjacent pipework/or equipment.
- 3) Expansion Joints fitted with a flow liner shall be installed in accordance with the flow arrow given on the Expansion Joint.
- 4) Extreme care shall be taken during unloading and installation to prevent damage. In particular the bellows is readily prone to damage. Such damage may include dent, scores, arc strikes, and weld spatter, all of which may be detrimental to the proper functioning of the Expansion Joint. Protect the bellows with wet, chloride free, insulation blanket during welding installation.
- 5) Shipping bars painted yellow, or shipping rods, must be removed from the Expansion Joint once it is correctly installed, and prior to hydrostatic testing of the system. This will allow the Expansion Joint to move as designed.

Warranty

Warranty is void if these instructions are not followed.

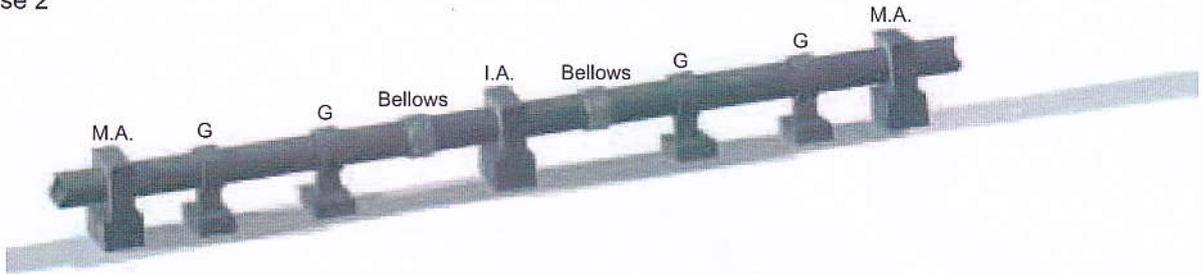
Case of Installation

Case 1



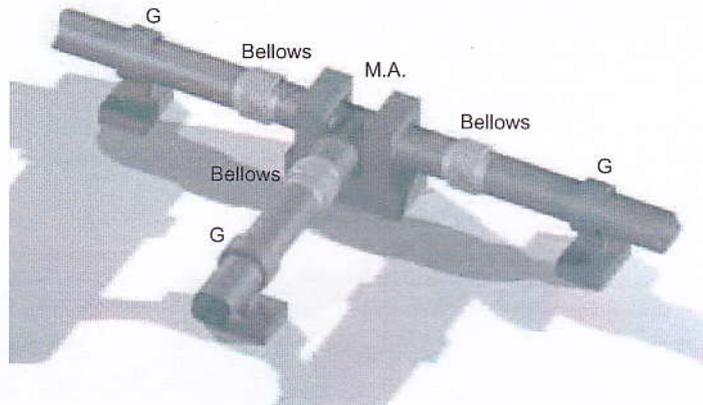
The basic form of single bellows Expansion Joint in a straight line piping between two Main Anchors (M.A.) with support Guides (G).

Case 2



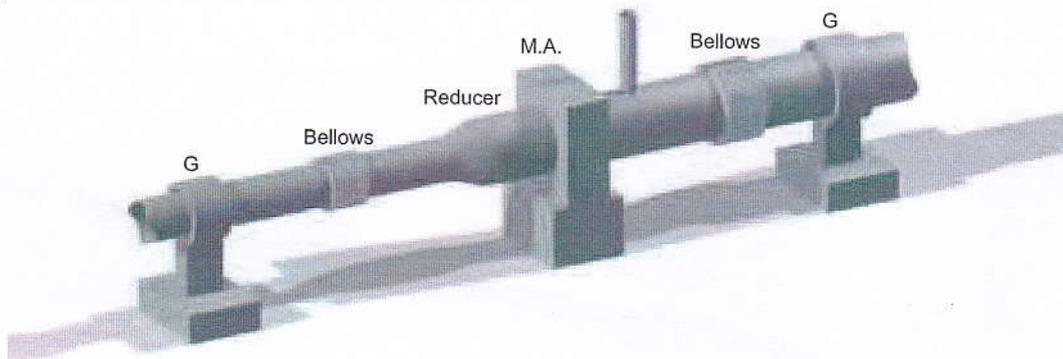
Universal or double bellows Expansion Joint in straight line piping between two Main Anchors and Intermediate Anchors (I.A.) at middle line with support Guides installed.

Case 3



Case of Installation : Expansion Joint at the entrance of a side branch piping.

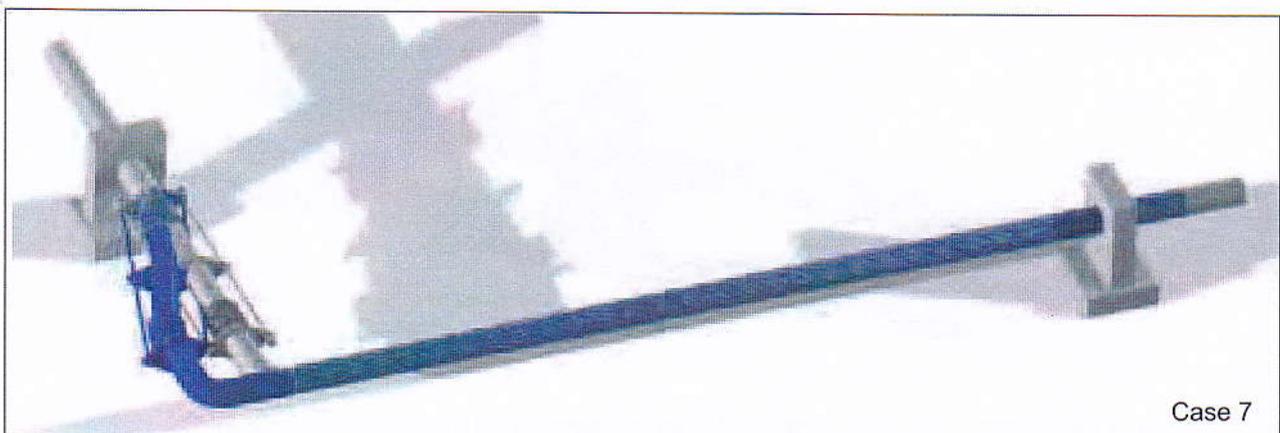
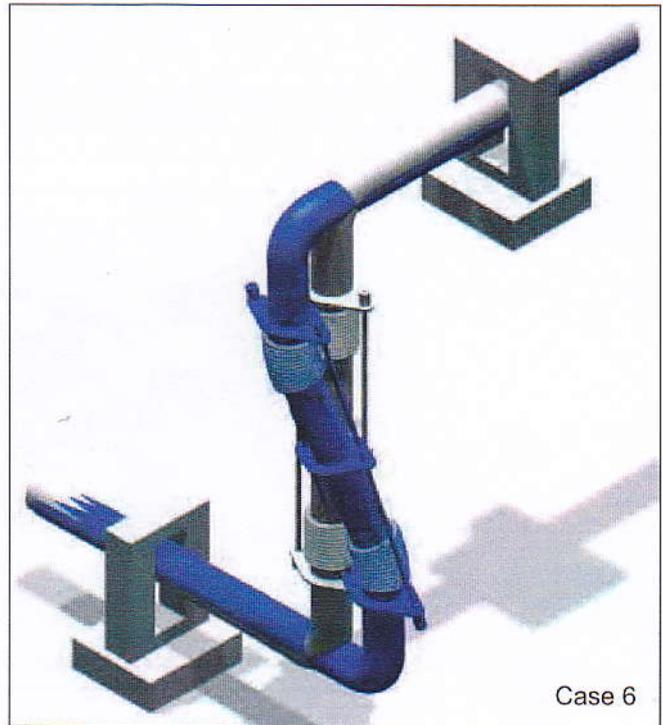
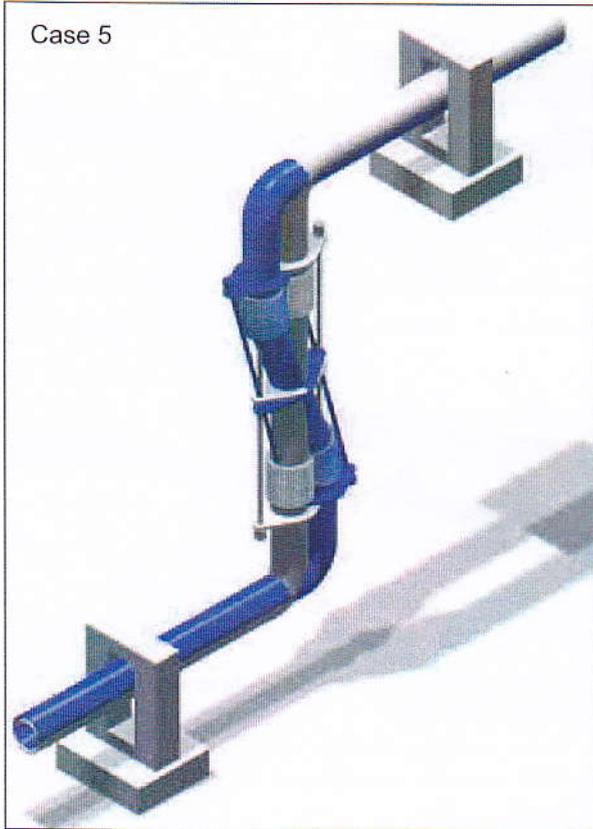
Case 4



Case of Installation : Expansion Joint between two pipes of different sizes in straight line.

Case 5, 6, 7

Which the system have not the main anchors and have free area for distortion.



Standard Expansion Joint Specification Sheet (1)

Company :		Date :	Sheet : of	Tel : 023675721-8
Project :		Inquiry No. :		Fax : 023675066
Customer Reference (PO No.) :		Job No. :		Fax : 023675729

Item	Item No./ Tag No.					TOZEN (THAILAND) CO., LTD. 3388/62 18th Floor, Srinrat Building, Rama IV Road, Klongtoey, Bangkok 10110, THAILAND TOZEN INDUSTRIAL CO., LTD. 126 Moo 9, Wellgrow Industrial Estate, Bangwao, Bangpakong, Chachoengsao, 24180 THAILAND
1*	Quantity					
2*	Nominal Size / ID / OD (mm)					
3	Expansion Joint Type					
4*	Fluid or Solid Information	Medium Name				
5*		Status (Solid/Liquid/Gas)				
6		Velocity (m/s)				
7		Flow Direction				
8*	Design Pressure (Bar)					
9	Test Pressure (Bar)					
10	Pressure at Operating Temperature (Bar)					
11*	Temperature	Operating (Degree C.)				
12		Max / Min (Degree C.)				
13		Installation (Degree C.)				
14	Max. Installation Movement	Axial Compression (mm)				
15		Axial Elongation (mm)				
16		Lateral (mm)				
17		Angular (degree)				
18*	Max. Design Movement	Axial Compression (mm)				
19*		Axial Elongation (mm)				
20*		Lateral (mm)				
21*		Angular (degree)				
22		No. of Cycle Life				
23	Operating Fluctuations	Axial Compression (mm)				
24		Axial Elongation (mm)				
25		Lateral (mm)				
26		Angular (degree)				
27		No. of Cycle Life				
28*	Materials of Construction	Bellows				
29*		Liners or Inner Sleeve				
30		Cover				
31*		Pipe Specification				
32*		Flange Specification				
33	Rods (Tie / Limit / Control / Shipping)					
34	Anchor Base (Main / Intermediate)					
35*	Dimensional Limitations	Overall Length (mm)				
36		Outside Diameter (mm)				
37		Inside Diameter (mm)				

* = MINIMUM REQUIRED INFORMATION

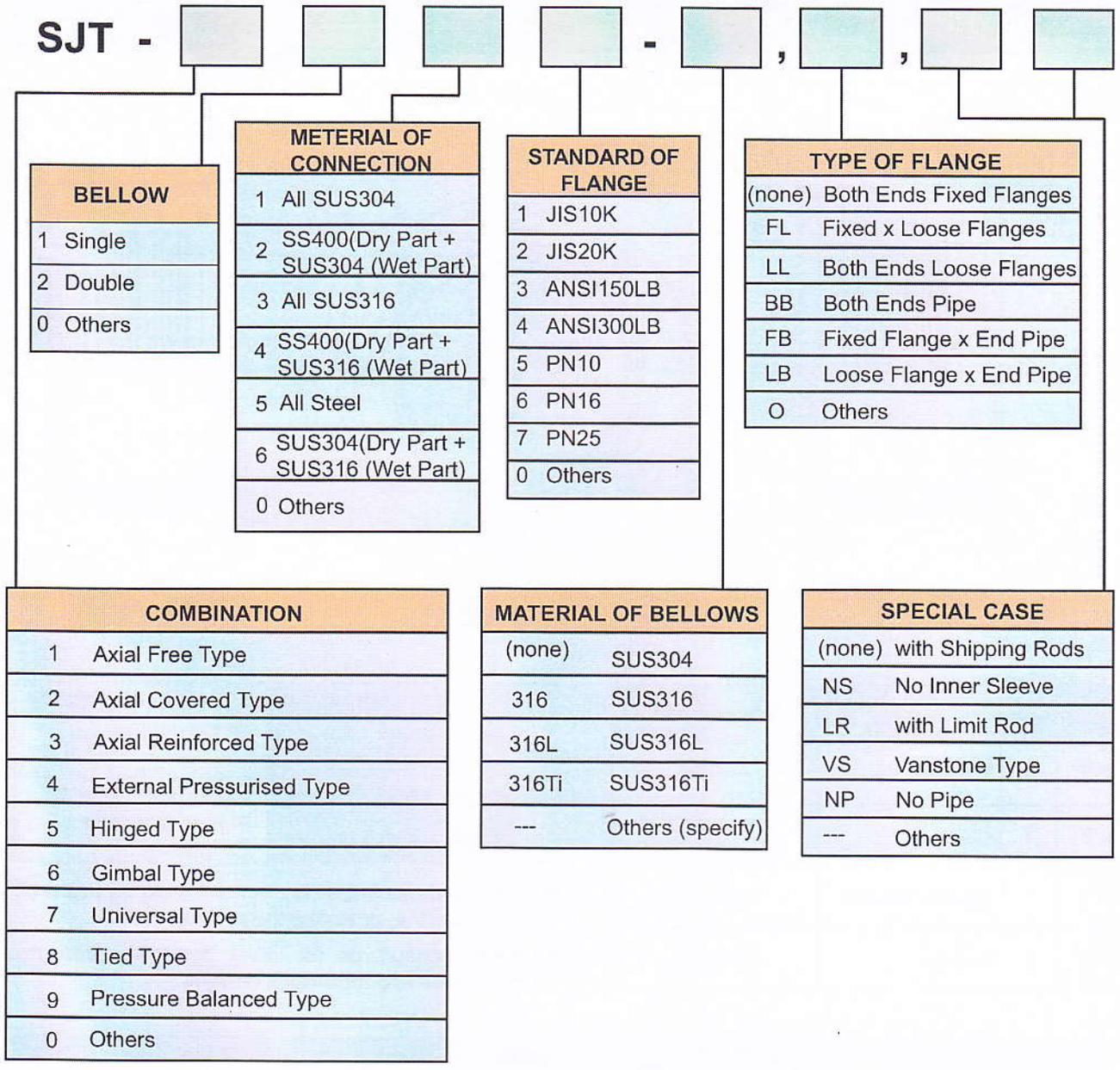
Standard Expansion Joint Specification Sheet (2)

Company :		Date :	Sheet : of	Tel : 023675721-8
Project :		Inquiry No. :		Fax : 023675066
Customer Reference (PO No.) :		Job No. :		Fax : 023675729
Item	Item No./ Tag No.			
38	Spring Rate Limitations	Axial (Kg / mm)		
39		Lateral (Kg / mm)		
40		Angular (Kg / mm / deg)		
41	Installation Position (Horizontal / Vertical)			
42	Vibration Amplitude / Frequency			
43	Purge Instrumentation Connection			
44	Special Flange Design	Facing		
45		O.D. (mm)		
46		I.D. (mm)		
47		Thickness (mm)		
48		P.C.D. (mm)		
49		No. of Holes		
50		Size of Holes		
51		Hole Orientation		
Piping Sketch / Product Sketch				

TOZEN (THAILAND) CO., LTD. 3388/62 18th Floor, Srinrat Building, Rama IV Road, Klongloey, Bangkok 10110, THAILAND
 TOZEN INDUSTRIAL CO., LTD. 126 Moo 9, Wellgrow Industrial Estate, Bangwao, Bangkok, Chachoengsao, 24180 THAILAND

Classification of STAINLESS STEEL EXPANSION JOINT

SJT -



BELLOW	
1	Single
2	Double
0	Others

MATERIAL OF CONNECTION	
1	All SUS304
2	SS400(Dry Part + SUS304 (Wet Part))
3	All SUS316
4	SS400(Dry Part + SUS316 (Wet Part))
5	All Steel
6	SUS304(Dry Part + SUS316 (Wet Part))
0	Others

STANDARD OF FLANGE	
1	JIS10K
2	JIS20K
3	ANSI150LB
4	ANSI300LB
5	PN10
6	PN16
7	PN25
0	Others

TYPE OF FLANGE	
(none)	Both Ends Fixed Flanges
FL	Fixed x Loose Flanges
LL	Both Ends Loose Flanges
BB	Both Ends Pipe
FB	Fixed Flange x End Pipe
LB	Loose Flange x End Pipe
O	Others

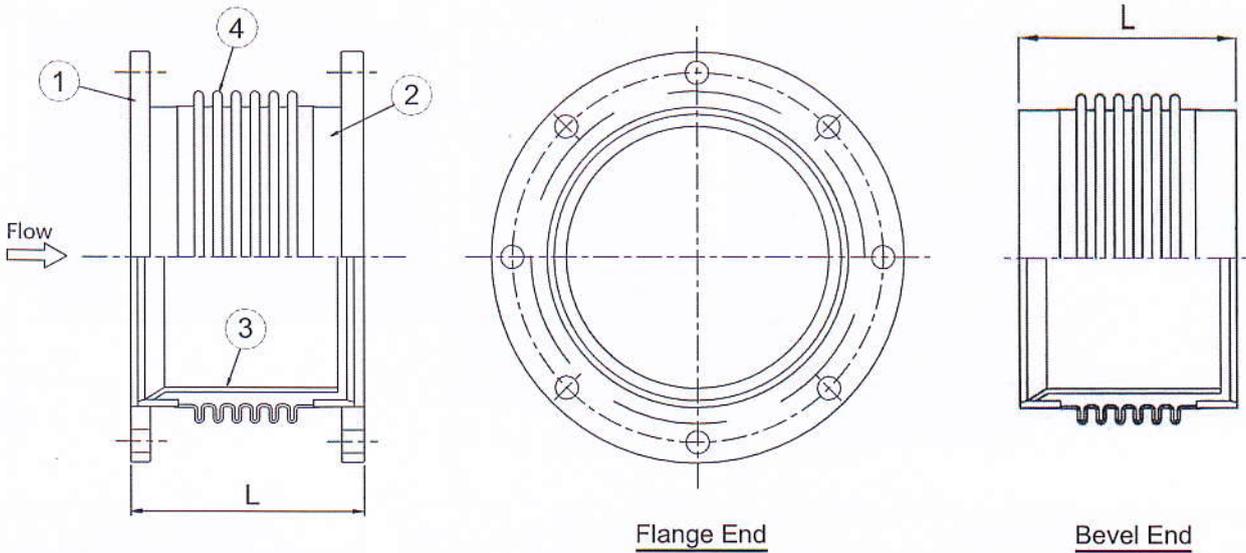
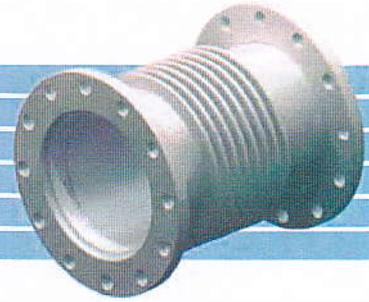
COMBINATION	
1	Axial Free Type
2	Axial Covered Type
3	Axial Reinforced Type
4	External Pressurised Type
5	Hinged Type
6	Gimbal Type
7	Universal Type
8	Tied Type
9	Pressure Balanced Type
0	Others

MATERIAL OF BELLOWS	
(none)	SUS304
316	SUS316
316L	SUS316L
316Ti	SUS316Ti
---	Others (specify)

SPECIAL CASE	
(none)	with Shipping Rods
NS	No Inner Sleeve
LR	with Limit Rod
VS	Vanstone Type
NP	No Pipe
---	Others

SJT1100

AXIAL FREE TYPE EXPANSION JOINT



Flange End

Bevel End

Item	Qty	Name	Standard Material
1	2	Flange	SS400
2	2	Pipe	CS
3	1	Internal Sleeve	SUS304
4	1	Bellow	SUS304

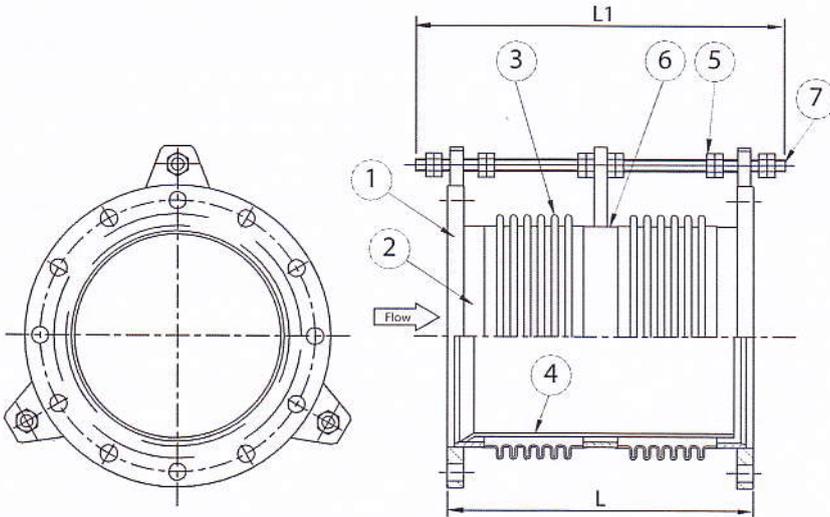
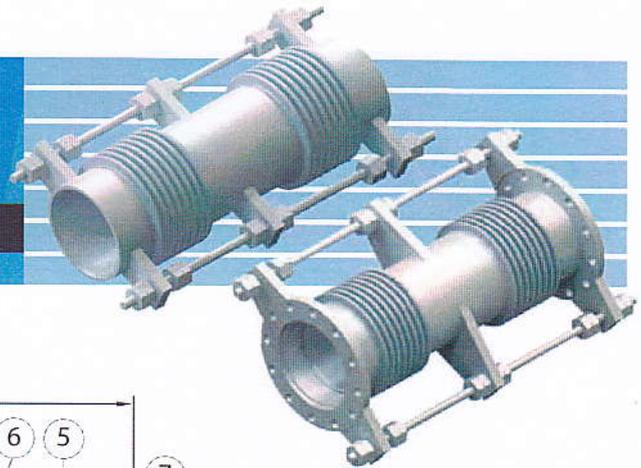
Design Working Pressure	1.02 MPA (10 Kgf/cm ²)
Design Working Temperature	250°C
Applicable Fluid	Water, Hot Water, Oil, Steam, Gas, and Exhaust Air

- Shipping devices (*painted yellow*) must be removed prior to start-up or testing the system.
- Please consult us for other material, pressure, temperature and movement designs.

Nominal Diameter A (B)	Length (L) (mm)		Axial Movement ±x (mm)	Effective Cross Section Area (cm ²)	Spring Constant (N/mm)	Mass (kg)	
	Flange End	Pipe End				Pipe End	Flange End
100 (4")	275	265	-30, +5	131.0	105.2	15.6	5.0
125 (5")	275	265	-30, +5	197.7	100.8	18.2	6.6
150 (6")	300	280	-30, +5	264.9	135.5	21.9	8.1
200 (8")	300	280	-30, +5	439.5	166.1	35.4	12.6
250 (10")	350	330	-30, +5	678.9	168.7	47.7	17.3
300 (12")	350	330	-30, +5	951.0	182.0	68.4	21.4

SJT1200-LR

UNIVERSAL EXPANSION JOINT with Limit Rods



Item	Qty	Name	Standard Material
1	2	Flange	SS400
2	2	Short Pipe	CS
3	2	Bellows	SUS304
4	1	Internal Sleeve	SUS304
5	N/A	Nut	SS400
6	1	Pipe	SS400
7	2 or 3	Limit Rods	SS400

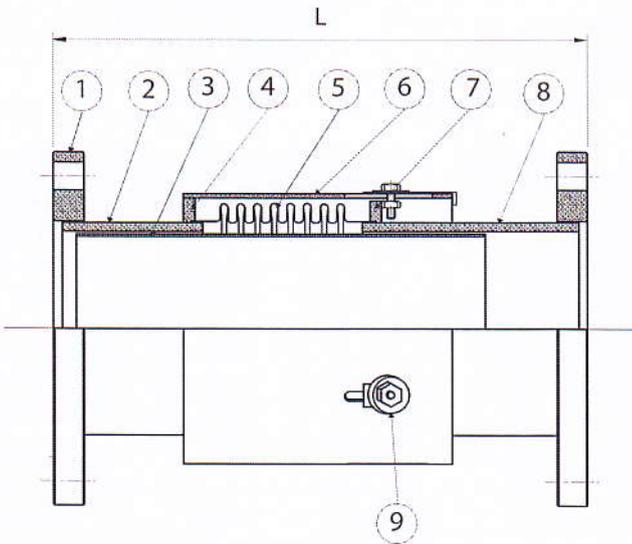
Design Working Pressure	1.02 MPA (10 Kgf/cm ²)
Design Working Temperature	250°C
Applicable Fluid	Water, Hot Water, Oil, Steam, Gas, and Exhaust Air

- Nuts are fixed by welding for allowable movement setting.
- Shipping devices (*painted yellow*) must be removed prior to start-up or testing the system.
- Please consult us for other material, pressure, temperature and movement designs.

Nominal Diameter A (B)	Min. Length (L) (mm)		Axial Movement ± x (mm)	Effective Cross Section Area (cm ²)	Spring Constant (N/mm)	Limit Rods & Holder		Approx. Weight (Kg)	
	Flange End	Bevel End				Size	L1 (mm)	Flange End	Bevel End
100 (4")	490	480	-60, +10	131.0	52.6	M16x2pcs	585	20.8	10.2
125 (5")	490	480	-60, +10	197.7	50.4	M16x2pcs	585	24.6	13.0
150 (6")	530	510	-60, +10	264.9	67.8	M16x2pcs	625	29.2	15.4
200 (8")	530	510	-60, +10	439.5	83.1	M16x2pcs	650	42.9	20.1
250 (10")	635	615	-60, +10	678.9	84.4	M20x2pcs	755	60.6	30.2
300 (12")	635	615	-60, +10	951.0	91.0	M20x2pcs	755	87.9	40.9

SJT2100

AXIAL COVERED TYPE SINGLE EXPANSION JOINT



Item	Qty	Name	Standard Material
1	2	Flange	SS400
2	1	Short Pipe 1	CS
3	1	Internal Sleeve	SUS304
4	1	Neck Ring 1	SS400
5	1	Bellow	SUS304
6	1	Outer Pipe	SS400
7	1	Neck Ring 2	SS400
8	1	Short Pipe 2	CS
9	3 or 4	Setting Bolt & Nut & Washer	Class4.4

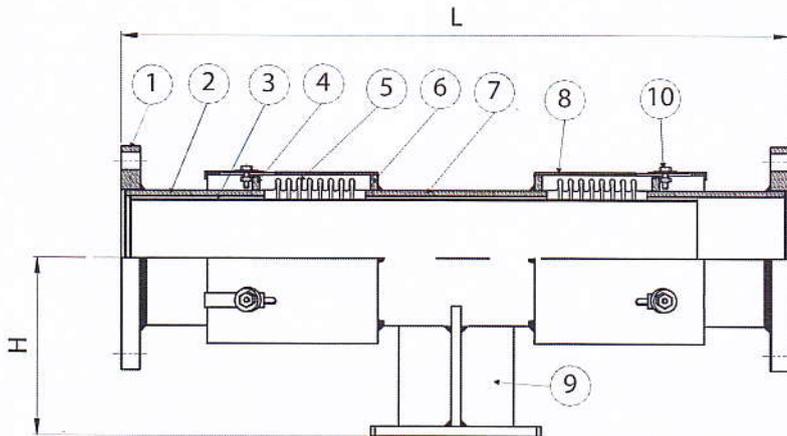
Design Working Pressure	1.02 MPA (10 Kgf/cm ²)
Design Working Temperature	250°C
Applicable Fluid	Water, Hot Water, Oil, Steam, Gas, and Exhaust Air

- Shipping devices (*painted yellow*) must be removed prior to start-up or testing the system.
- Please consult us for other material, pressure, temperature and movement designs.

Nominal Diameter A (B)	Length (L) (mm)	Axial Movement ± x (mm)	Effective Cross Section Area (cm ²)	Spring Constant (N/mm)	Mass (kg)
100 (4")	415	-30, +5	131.0	105.2	18.8
125 (5")	415	-30, +5	197.7	100.8	22.5
150 (6")	440	-30, +5	264.9	135.5	27.5
200 (8")	440	-30, +5	439.5	166.1	45.0
250 (10")	465	-30, +5	678.9	168.7	60.2
300 (12")	465	-30, +5	951.0	182.0	84.7

SJT2200

AXIAL COVERED TYPE DOUBLE EXPANSION JOINT



Item	Qty	Name	Standard Material
1	2	Flange	SS400
2	2	Short Pipe	CS
3	1	Internal Sleeve	SUS304
4	2	Neck Ring 2	SS400
5	2	Bellow	SUS304
6	2	Neck Ring 1	SS400
7	1	Middle Pipe	CS
8	2	Outer Pipe	SS400
9	1	Anchor Base	SS400
10	6 or 8	Setting Bolt & Nut & Washer	Class4.4

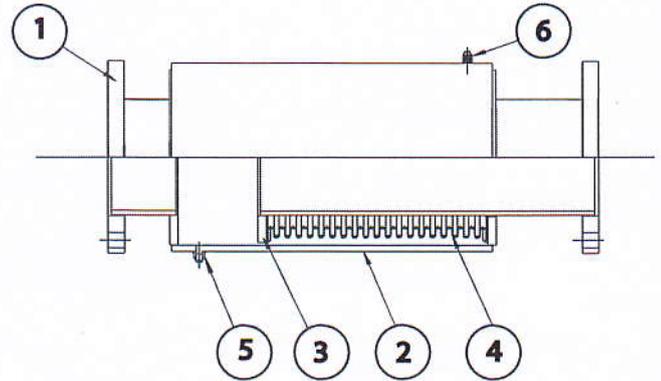
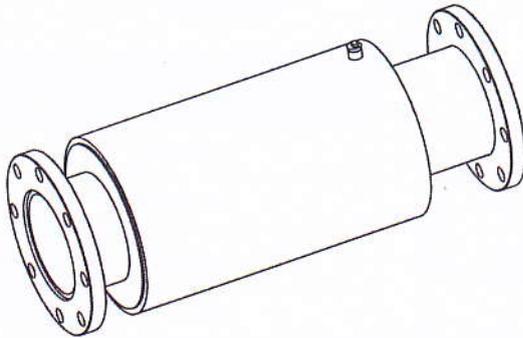
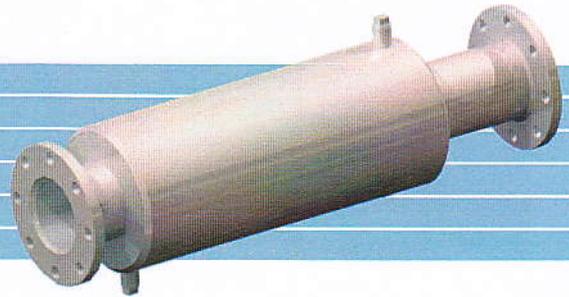
Design Working Pressure	1.02 MPA (10 Kgf/cm ²)
Design Working Temperature	250°C
Applicable Fluid	Water, Hot Water, Oil, Steam, Gas, and Exhaust Air

- Shipping devices (*painted yellow*) must be removed prior to start-up or testing the system.
- Please consult us for other material, pressure, temperature and movement designs.

Nominal Diameter A (B)	Length (L) (mm)	H (mm)	Axial Movement ± x (mm)	Effective Cross Section Area (cm ²)	Spring Constant (N/mm)	Mass (kg)
100 (4")	880	170	-60, +10	131.0	52.6	31.9
125 (5")	880	200	-60, +10	197.7	50.4	39.9
150 (6")	930	220	-60, +10	264.9	67.8	51.5
200 (8")	930	250	-60, +10	439.5	83.1	80.8
250 (10")	980	300	-60, +10	678.9	84.4	108.3
300 (12")	980	350	-60, +10	951.0	91.0	150.1

SJT4100

EXTERNAL PRESSURIZED EXPANSION JOINT



Item	Qty	Name	Standard Material
1	2	Standard Flange	SS400
2	1	Outer Pipe	CS
3	1	Guide Ring	SS400
4	1	Bellow	SUS316L
5	1	Drain plug (R 1/2")	FCMB
6	1	Purge Connection (R 1/2")	CS

Design Working Pressure	1.02 MPA (10 Kgf/cm ²)
Design Working Temperature	200°C
Applicable Fluid	Water, Hot Water, Oil, Steam, Gas, and Exhaust Air

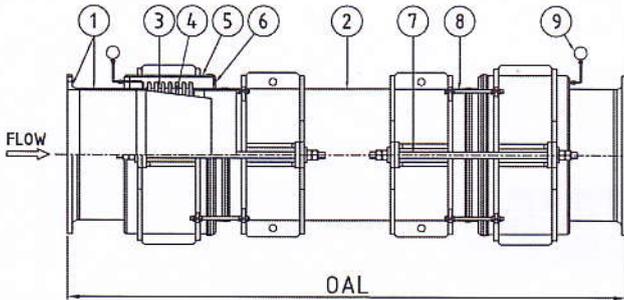
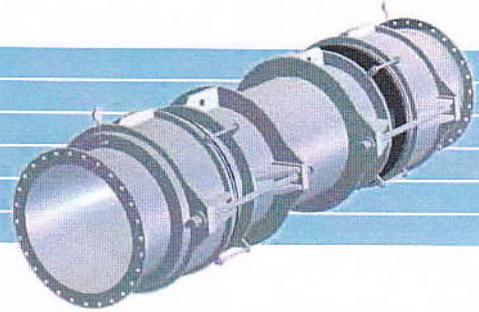
- Besides the large amount of axial movement, another special feature of external pressure balanced type expansion joint is the self-draining convolutions. It can prevent any the acumination of corrosive or solid particles from building up. Liquid media can 100% drains away from the drain connection, if needed,assists by the purging.
- SUS 304 bellows and pipe are available upon requested.
- For steam application, it is advised using steam trap with the drain connection which eliminates the possibility of any condensate liquid "flashing" to vapor during startups.
- Shipping devices (*painted yellow*) must be removed prior to start-up or testing the system.
- Please consult us for other material, pressure, temperature and movement designs.

Nominal Diameter A (B)	Length (L) (mm)	Axial Movement (mm)	Effective Cross Section Area (cm ²)	Spring Constant (N/mm)	Mass (kg)
25 (1")	475	-50	27.4	10.7	7.10
32 (1-1/4")	475	-50	27.4	10.7	8.20
40 (1-1/2")	475	-50	27.4	10.7	9.10
50 (2")	500	-50	44.5	20.7	13.10
65 (2-1/2")	550	-50	62.8	33.4	20.20
80 (3")	750	-75	97.0	26.4	30.70
100 (4")	800	-100	161.7	24.0	50.50
125 (5")	800	-100	228.3	31.5	58.80
150 (6")	850	-100	381.9	43.0	82.90

SJT8200

METAL EXPANSION JOINT FOR WATERWORKS PIPING

UNDERGROUND TYPE



Item	Qty	Name	Standard Material
1	2	Fixed Flange & Pipe	Carbon Steel (SS400)
2	1	Middle Pipe	Carbon Steel (SS400)
3	2	Stainless Steel Bellows	Stainless Steel (SUS304)
4	2	Inner Sleeve	Stainless Steel (SUS304)
5	2	Cover Pipe	Carbon Steel (SS400)
6	2	Rubber Soil Shield	Rubber w/synthetic reinforcement
7	2	Tied Rod	Carbon Steel w/H.D. Galv
8	-	Shipping Rod & Holder	SS400
9	2 set	Monitoring pressure gauge	(Optional)

Design Working Pressure	1.02 MPA (10 Kgf/cm ²)
Design Working Temperature	Ambient
Applicable Fluid	Fresh water

- Shipping devices (*painted yellow*) must be removed prior to start-up or testing the system.
- Please consult us for other material, pressure, temperature and movement designs.

Size mm (inch)	Axial Movement (mm)	The Overall Length (OAL, mm) for the Lateral Movement, Y		
		Y=200 mm	Y=500 mm	Y=800 mm
300A(12")	±50	1800	3200	3600
350A(14")	±50	1800	3200	3800
400A(16")	±50	1800	3200	3800
450A(18")	±50	1900	3200	4000
500A(20")	±50	2000	3500	4000
600A(24")	±50	2100	3500	4500
700A(28")	±50	2100	3500	4500
800A(32")	±50	2200	4000	5000
900A(36")	±50	2300	4000	5400
1000A(40")	±50	2300	4000	5400
1200A(48")	±50	2500	4500	6000
1350A(54")	±50	2600	4500	6000
1400A(56")	±50	2600	4500	6000
1500A(60")	±50	2700	4500	6200
1800A(72")	±50	2900	5000	7000

- Noted: 1) Radiographic test (X-ray) on longitudinal welding and seam is available upon request.
 2) Material of steel pipe refer to ASTM A283 or JIS G3101 or equivalent.
 3) Steel pipe surface preparation standard to SSPC-SP10, (Gr 2-1/2).
 4) All interior and exterior surface of carbon steel or mild steel parts (except stainless steel part) are coated with liquid epoxy coating system (containing no coal tar) conforming to AWWA C210 with minimum thickness 406 microns or otherwise upon request.
 5) Redundant ply design & monitoring pressure gauge is available upon request.



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ADVANCE SYNDICATE CO.,LTD.

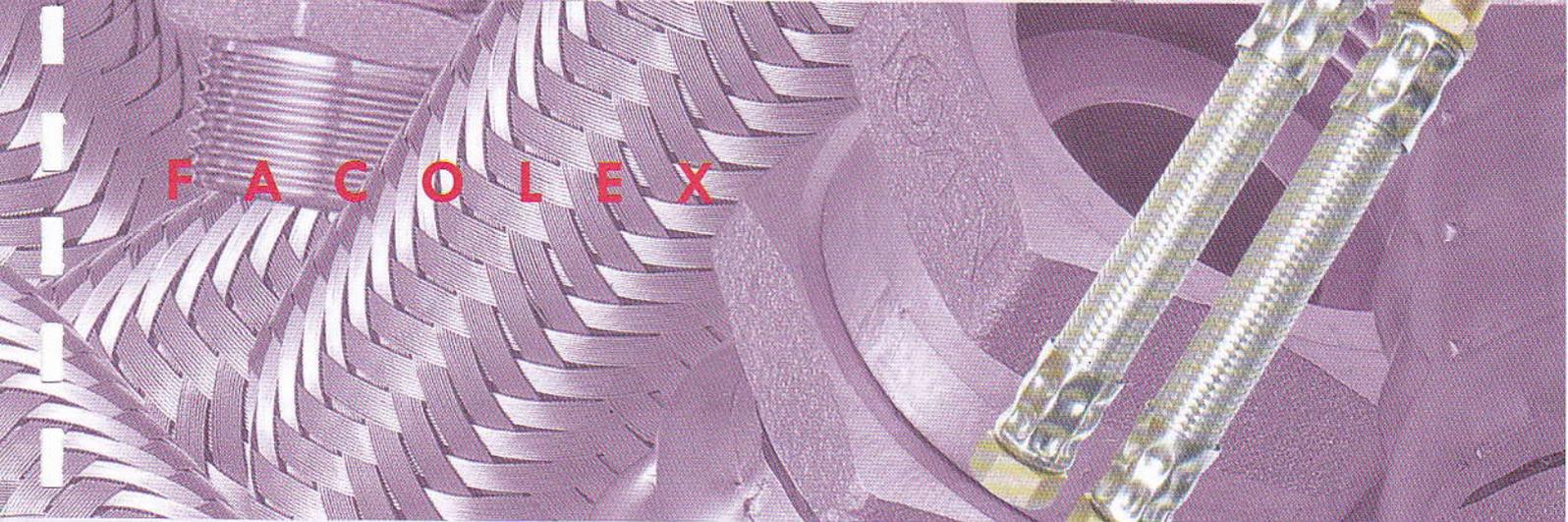
ที่อยู่ บริษัท 36/8 หมู่ที่3 ซอยฉิมพลี21 ถนนบรมราชชนนี แขวงฉิมพลี เขตตลิ่งชัน
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FACOLEX

FLEXIBLE HOSE FOR FANCOIL UNIT

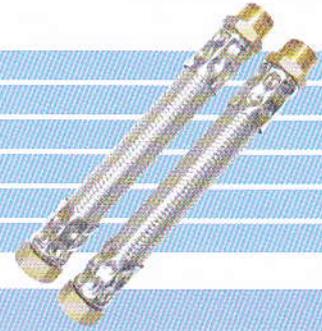


F A C O L E X



FACOLEX

FLEXIBLE HOSE FOR FANCOIL UNIT



FEATURES

FACOLEX flexible hoses are made of EPDM tube braided with stainless steel wire. They are applicable with water exclusively. FACOLEX is the most suitable connecting hoses for fancoil units and sanitary equipment. FACOLEX is very attractive with its excellent performance and outstanding reliability where a similar conventional one is not comparable with. Other important features of FACOLEX are :

- **New type of flexible hoses** : It is made of an elastomer tube and is sufficiently strengthened by stainless steel wire braiding.
- **Reliable and durable** : The high grade elastomer body material used effectively stabilizes water pressure against the effects of temperature fluctuation. The body material is also proofed against rusting and corrosion.
- **Minimize chance of water leakage in piping system** : FACOLEX is designed with a limited number of threading for connection in piping system, which helps to reduce the chance of water leakage. The number of joints used in the piping system may be reduced 83-87% with the use of FACOLEX.
- **Efficient installation** : Installation has become easier and more cost effective by the use of flexible elastomer body, which requires less fitting space and considerable reduction of labor hours.
- **Useful to isolate sound and vibration** : The use of FACOLEX reduces the transmission of sound and vibration which helps to relieve the occurrence of pulsation and water hammer.
- **Easy for maintenance and replacement** : Maintenance and replacement are easier by using FACOLEX.

STRUCTURE

No.	Parts	Materials
1	Tube	EPDM
2	Sleeve	BsBM / BC6
3	Nipple	BsBM / BC6
4	Braid	SUS304
5	Collar	SUS304
6	Cap Nut	BsBM / BC6
7	Gasket	Non-asbestos

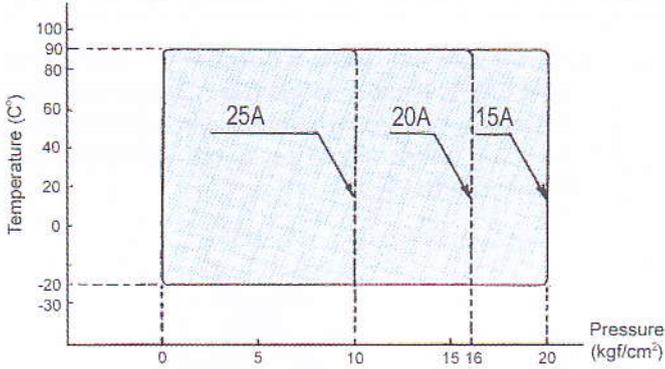
- FACOLEX standard end connections : One end **adaptor, BsBM**, parallel thread completed with gasket. The other end **nipple, BsBM**, male tapered thread.
- Other end connections, like (adaptor x adaptor) and (nipple x nipple), are available. Please consult us.

DIMENSION AND ALLOWABLE MOVEMENT

Nominal Dia.	Inner Dia. Ød1	Inner Dia. Ød2	Outer Dia. ØD	Tube Dimension		End Connection G(f)xR(m)	Min. Bending Radius	Connection Size				Length (L or OAL)
				Inner Dia. ØID	Outer Dia. ØOD			A	B	C	H	
15	10	12	22	14.5	21.5	G1/2 x R1/2	80	6	13	15	24	200, 300, 500, 800, 1000, 1500
20	15	17	28	19.5	27.5	G3/4 x R3/4	100	8	15	16	30	
25	20	25	34.6	25	34	G1 x R1	125	8	17	18	36	

For the length other than mentioned above, please consult us.

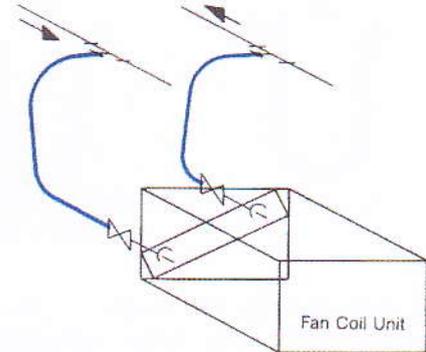
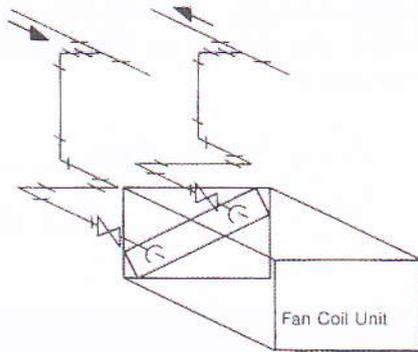
● OPERATING CONDITION



Nominal Dia. (mm)	Max. Operating Pressure (Kgf/cm ²)	Bursting Pressure (Kgf/cm ²)	Operating Temperature Range
15	20	90	-20 to 90°C
20	16	70	
25	10	60	

Remark : FACOLEX is not applicable to oil.

● EXAMPLE OF INSTALLATION COST ESTIMATION IN JAPAN



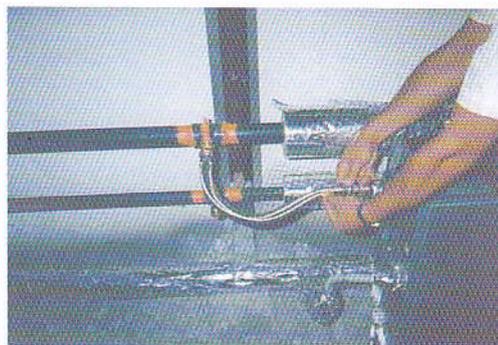
Traditional Installation Method			
Materials	Qty	Unit Rate	Cost
White Gas Tube 20A	3	400	1,200
Elbow 20A	8	200	1,600
SUS Flexible Joint 20A x 300L	2	5,000	10,000
Other Miscellaneous Materials of Consumption	1 set		150
Installation Process Charge	90 min	30,000/day	5,620
Total (JPY)			18,570

FACOLEX Installation Method			
Materials	Qty	Unit Rate	Cost
FACOLEX 20Ax1000L	2	8,200	16,400
Other Miscellaneous Material of Consumption	1 set		30
Installation Process Charge	5min	30,000/day	320
Total (JPY)			16,750

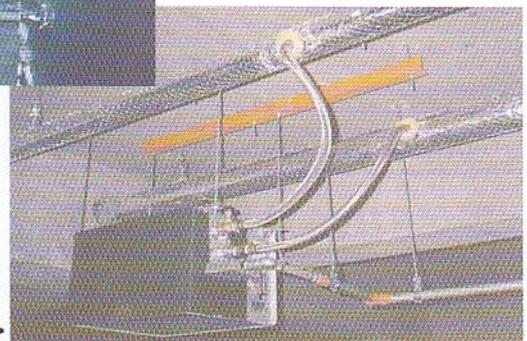
● EXAMPLES



▲ Pressure Test



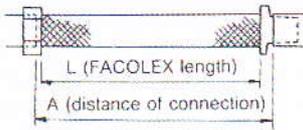
< Floor Mounted FCU



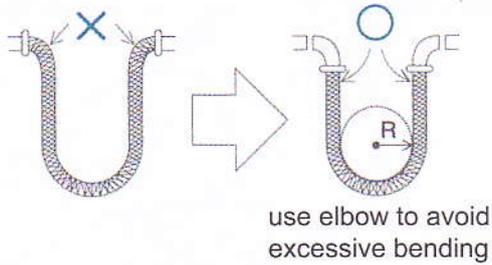
Ceiling Mounted FCU >

• NOTES

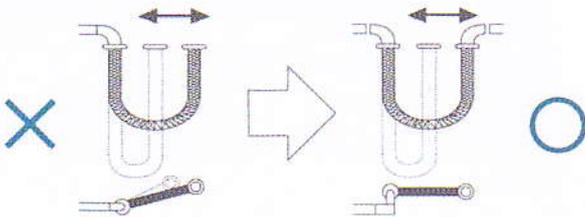
1. Do not extend. Install with slight bending.



2. Be aware of excessive bending : Excessive bending or unusual curving of FACOLEX shortens the life. Use elbow for the small bending portion to avoid excessive bending of the hose.



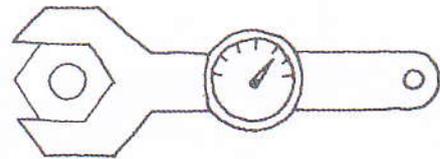
3. Do not distort the hose : Be aware of distorting the hose when tightening up the union-nut during installation. Distortion of hose will accelerate aging or damage the hose.



4. Be aware of heat sources : The body of FACOLEX is made of EPDM. Do not put close to heat sources (torch-lamp bonfire, gas-burner and welding work, etc.) to avoid generating high temperature.



5. Use proper torque : Use the adaptor and gasket provided and tighten up the adaptor with the following torque.



Nominal Dia. (mm)	Standard Tightening Torque (Kgf.m)	Wrench Nominal Size (mm)	Force Given (Kgf)
15	3	350	12
20	6	350	24
25	10	450	30

** If gasket is loosened after tightening up, please replace with a new one.

Company reserves the right to change any details without prior notice.

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ADVANCE SYNDICATE CO.,LTD.

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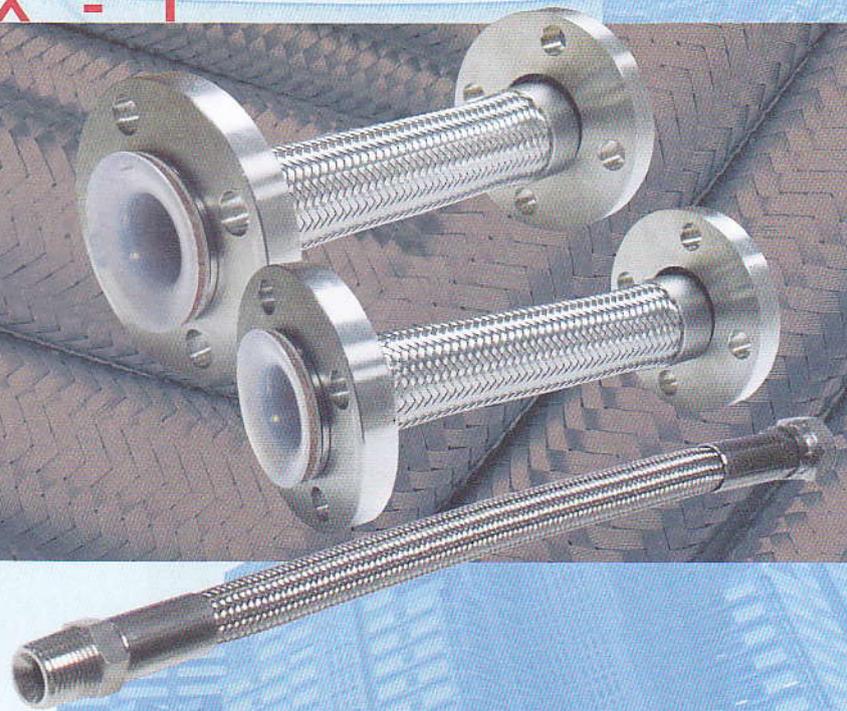
Tel : 0-2880-4501-4 , 0-2880-4611 , 0-2880-4865 Fax : 0-2884-1968

E-mail : snnvalve@truemail.co.th www.advance-thai.com

POLIFLEX-T

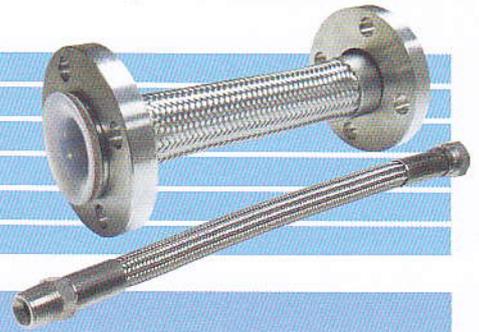
PTFE FLEXIBLE JOINT

P O L I F L E X - T



POLIFLEX-T

PTFE FLEXIBLE JOINT



FEATURES

Polytetrafluoroethylene (PTFE) hose has solved the short life problem of metallic hose from using with most dangerous fluids like acids, caustics, chemicals, organic solvent, noxious gas, etc. This material has outstanding chemical resistance to wide variety of chemicals and the long service life that make it ideal for use in hose application. Besides, the nonstick feature of PTFE makes it ideal for food and pharmaceutical process. Many other critical applications of PTFE hose is used for imperative reliability such as submarine and life saving devices. The additional benefit is the reduced maintenance costs and low inventory costs.

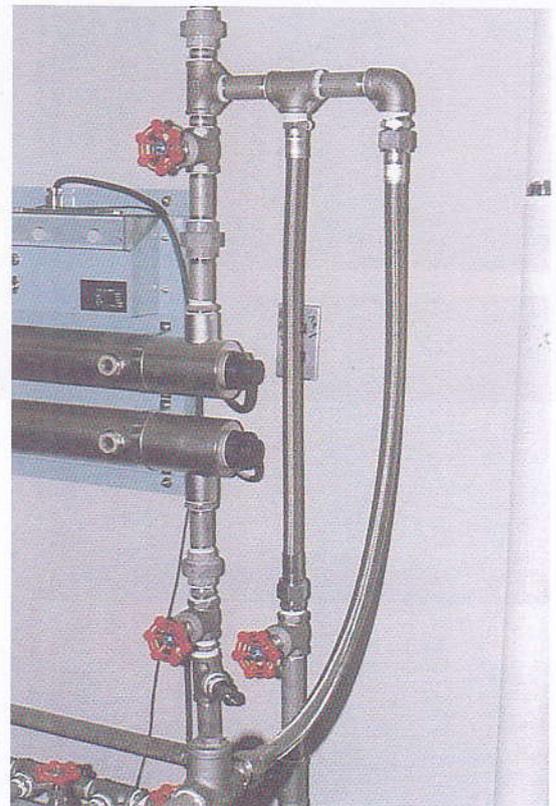
Poliflex-T is available with either a corrugated profile enhancing flexibility or smooth bore for minimizing pressure drop and stabilizing the flow. When completed with stainless steel wire braid, PTFE hose are able to be used under high pressure, continuous flexing, and vibration condition.

TEMPERATURE SERVICE

The service temperature of PTFE is ranging from -73°C to $+260^{\circ}\text{C}$. However in considering the demand of other factors or parameters such as movement and pressure load, we recommend the maximum service temperature up to 200°C .

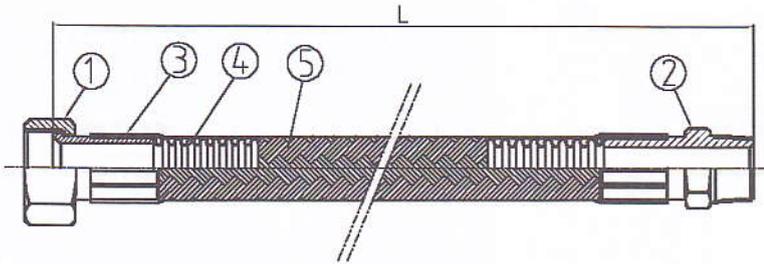
CAUTION

Although PTFE resists most corrosive media, it is not suitable for Alkali metals (such as sodium and potassium, dissolved on metals) and fluorine compounds (such as fluorides, fluorine oxide, fluorine gas, and fluorinated hydrocarbons).



TJ-4450-0

Screw Type



No.	Parts	Standard Materials
1	Screw end fitting	SUS304
2	Screw end fitting	SUS304
3	Ferrule	SUS304
4	Corrugated hose	PTFE
5	Wire braid	SUS304

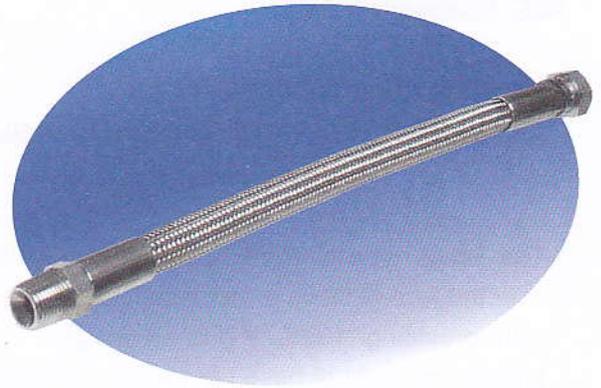
- Screw end fittings can be changeable to SUS316.

SPECIFICATION :

Max. Operating Temperature : 260°C

Application : Chemicals, Pharmaceutical, Biomedical, Food, Cosmetic, etc.

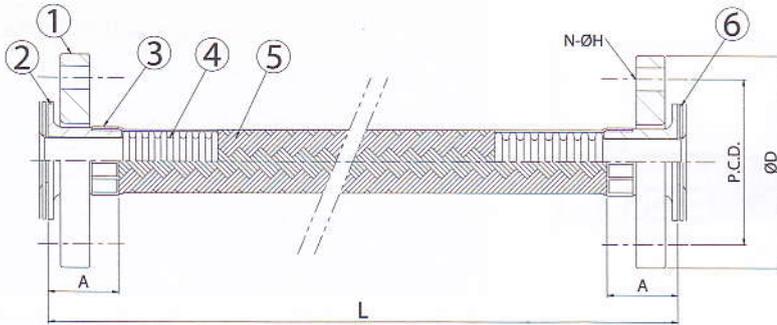
The screw end type of PTFE convoluted hose is suitable for small size connection, and it can support higher pressure than flange type but it is not providing 100% PTFE coverage at all wet surface, therefore please specify material to your application such as SUS316.



Nominal Size A (B)	Min. ID of Hose (mm)	Wall Thickness (mm)	Min. Bending Radius (mm)	Max. Working Pressure (bar)	Bursting Pressure (bar)	Ineffective Length (mm)	Overall Length			
							300mm	500mm	1000mm	2000mm
							Eccentric (mm)			
8 (1/4")	6.73	0.76	17.8	172	517	110	83	175	403	861
10 (3/8")	9.14	0.76	20.3	138	414	118	79	170	399	857
15 (1/2")	12.45	0.89	25.4	103	310	136	70	161	390	848
20 (3/4")	18.54	0.89	63.5	69	207	166	48	140	369	826
25 (1")	24.89	1.02	88.9	46	138	194	30	122	351	809
32 (1-1/4")	31.00	1.02	88.9	34	103	220	18	110	339	797
40 (1-1/2")	37.50	1.02	152.4	30	90	240	5.8	88	317	775
50 (2")	48.00	1.09	190.5	23	69	280	0.5	62	291	749

TJ-78800

Loose Flanges Type with Flare



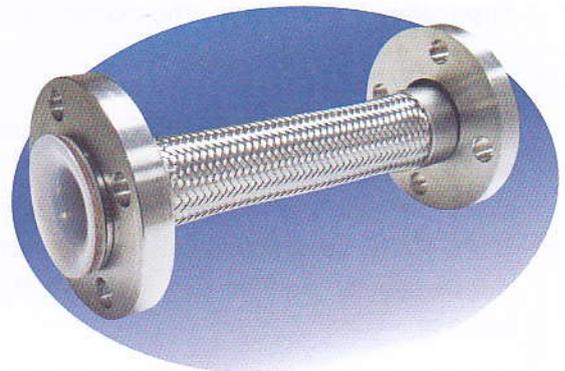
No.	Parts	Standard Materials
1	Loose flange	SUS304
2	Lap joint	SUS304
3	Collar	SUS304
4	Corrugated hose	PTFE
5	Wire braid	SUS304
6	Gasket	ASBESTOS

SPECIFICATION :

Max. Operating Temperature : 260°C

Application : Chemicals, Pharmaceutical, Biomedical, Food, Cosmetic, etc.

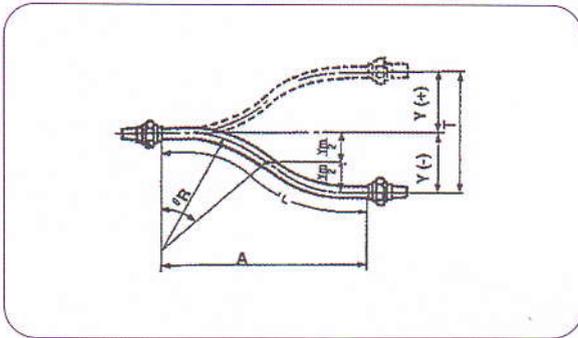
The flange type of PTFE convoluted hose with flare over the face of fitting is the benefit for all wet surfaces with providing 100% PTFE coverage. This type protects all parts of hose from abrasive proceeding of fluid.



- Flanges can be selected in standard of JIS, ANSI, ISO/PN, BS, etc.
- Flange material can be changeable to mild steel, carbon steel, and SUS316.
- Lap joint material can be changeable to SUS316.

Nominal Size A (B)	Min. ID of Hose (mm)	Wall Thickness (mm)	Min. Bending Radius (mm)	Max. Working Pressure (bar)	Bursting Pressure (bar)	Ineffective Length Ax2 (mm)	Overall Length			
							300mm	500mm	1000mm	2000mm
							Eccentric (mm)			
15 (1/2")	11.6	0.82	25	10	40	60	104	196	425	883
20 (3/4")	19.5	1.00	55	10	40	60	98	190	419	877
25 (1")	24.5	1.10	85	10	40	100	74	166	395	852
32 (1 1/4")	31.5	1.15	100	10	40	100	71	163	392	849
40 (1 1/2")	36.5	1.45	120	10	40	100	67	159	388	845
50 (2")	49.5	1.50	165	10	40	100	58	150	379	836
65 (2 1/2")	62.5	1.60	230	10	40	100	45	137	366	823
80 (3")	73.5	1.60	260	10	40	100	37	131	360	817
100 (4")	94.5	1.82	400	10	40	100	24	103	332	790

Calculation for Hose Length (L) with Movement



1. Offset Movement

(in case of non-alignment)

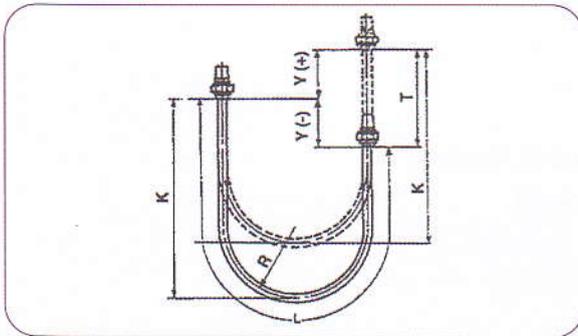
$$Y_m = 2 \cdot R (1 - \cos \theta) \dots\dots\dots (1)$$

$$Y_L = 2 \cdot R (1 - \cos \theta) + (L - \frac{\theta \cdot \pi \cdot R}{90}) \cdot \sin \theta \dots\dots\dots (2)$$

$$A_m = 2 \cdot R \cdot \sin \theta \dots\dots\dots (3)$$

$$A_L = 2 \cdot R \cdot \sin \theta + (L - \frac{\theta \cdot \pi \cdot R}{90}) \cdot \cos \theta \dots\dots\dots (4)$$

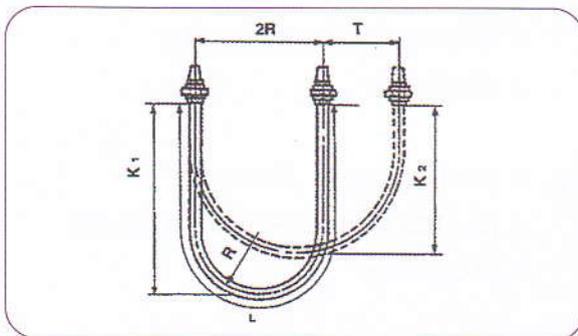
$$R = \frac{D_m \cdot Q}{2 \cdot e} \dots\dots\dots (5)$$



2. Vertical Movement

$$L = 4R + \frac{T}{2} \dots\dots\dots (6)$$

$$K = 1.43R + \frac{T}{2} \dots\dots\dots (7)$$



3. Horizontal Movement

$$L = 4R + 1.57T \dots\dots\dots (8)$$

$$K_1 = 1.43R + 0.785T \dots\dots\dots (9)$$

$$K_2 = 1.43R + \frac{T}{2} \dots\dots\dots (10)$$

Symbols :

T	: Total value of displacement (Movement)	mm
L	: Length of the hose	mm
Lm	: Min. effective length of the hose	mm
Y	: Movement from the centre	mm
Ym	: The value of min. effective length of the hose (Short length hose)	mm
YL	: The value by the effective length of the hose > Lm (Long length hose)	mm
A	: Face-to-face Dimension	
Am	: The value by Lm of the effective length of the hose (Short length hose)	mm
AL	: The value by the effective length of the hose > Lm (Long length hose)	mm
R	: Allowable bending radius	mm
Dm	: Effective Diameter	mm
Q	: Hose Pitch	mm
e	: Elongation and Compression per Bellows	mm
theta	: Bend Angle	degree
K	: Loop Length	mm

Sample of Offset Movement Calculation

For Static Installation

PTFE Hose (Flange Type)

Size : 50A x 1000mmL.

Bending Radius : 165mmL.

Ineffective Length : 100mmL.

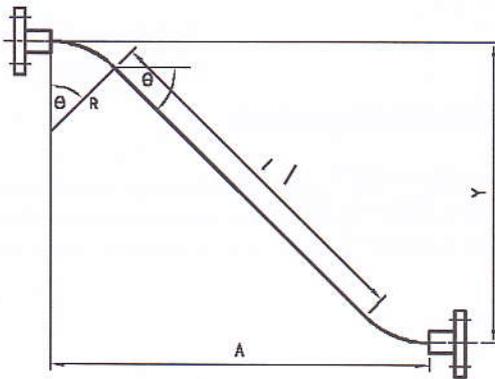
$$\begin{aligned} \text{So, } L &= (L \text{ of overall hose length}) - (\text{Ineffective length}) \\ &= 1000 - 100 \\ &= 900\text{mmL.} \end{aligned}$$

Check θ for selecting the formula of movement

$$\begin{aligned} L &= (\pi \times R \times \theta) / 90 \\ \theta &= (90 \times 900) / (\pi \times 165) = 156.2^\circ \end{aligned}$$

So, $\theta = 156.2^\circ > 45^\circ$ use long length hose formula (YL and AL formula)

[if $\theta \leq 45^\circ$ use short length hose formula (Ym and Am formula)]



Select YL & AL Formula and use $\theta = 45^\circ$

$$\begin{aligned} l &= L - 2 \times (\pi \times R \times \theta / 180) \\ &= 900 - 0.03492 \times (165) \times (45) \\ &= 640.7 \text{ mm} \end{aligned}$$

$$\begin{aligned} \text{AL} &= (2 \times R \times \sin \theta) + (l \times \cos \theta) \\ &= (2 \times 165 \times \sin 45) + (640.7 \times \cos 45) \\ &= 686.39 \text{ mm.} \end{aligned}$$

$$\begin{aligned} \text{YL} &= (2 \times R \times (1 - \cos \theta)) + (l \times \sin \theta) \\ &= (2 \times 165 \times (1 - \cos 45)) + (640.7 \times \sin 45) \\ &= 549.7 \text{ mm.} \end{aligned}$$

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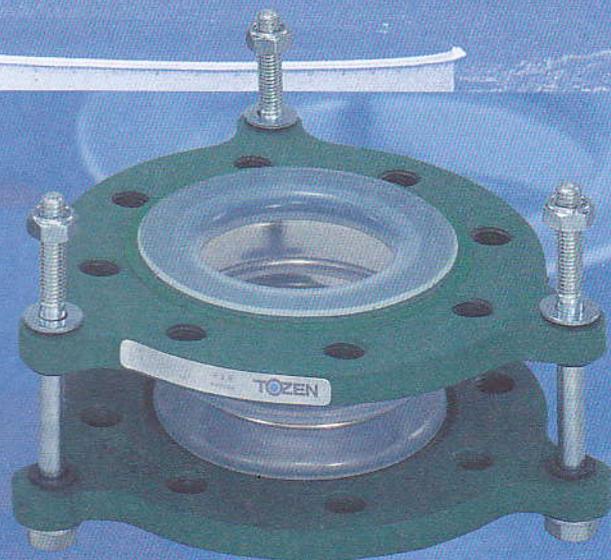
E-mail : snnvalve@truemail.co.th www.advance-thai.com

FLONEX

TEFLON EXPANSION JOINT



F L O N E X



FLONEX

TEFLON EXPANSION JOINT



Features

• TEFLON EXPANSION JOINT

Teflon expansion joint has the best features of chemical resistance, heat resistance, thermal stability, non-adhesive, weather resistance and high resistance to physical fatigue. TOZEN recommends FLONEX for today's piping systems.

• HIGH CHEMICAL RESISTANCE

Teflon has high chemical resistance to every chemical except flourine gas (CIF₃ & OF₂) and fusing alkali metal. Therefore, FLONEX is suitable for various acids, alkalines and solvents.

• HEAT RESISTANCE AND THERMAL STABILITY

FLONEX can afford a wide working temperature range from -20°C to +130°C.

• NON-ADHESIVITY

FLONEX has high non-adhesivity. Therefore, FLONEX is applicable to sticky fluids. Inside of FLONEX can be also cleaned easily.

• WEATHER RESISTANCE

FLONEX can be used in outdoor for a long period without any aging deterioration.

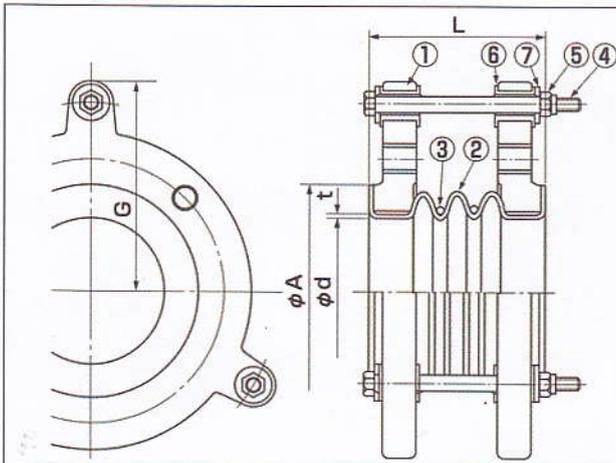
• EXCELLENT FLEXIBILITY

Owing to our special hydraulic forming, FLONEX has smaller thickness difference than other Teflon bellows. FLONEX provides the maximum flexibility for expansion compensation, vibration and sound absorption in a very short length. Since Teflon contains no carbon element, no electrolysis will be generated. It is specially recommended for the use of potable water and demineralized water.

Applications

Chemical Processing Industries, Water Treatment Plant, HVAC Systems and other industries.

• Structure

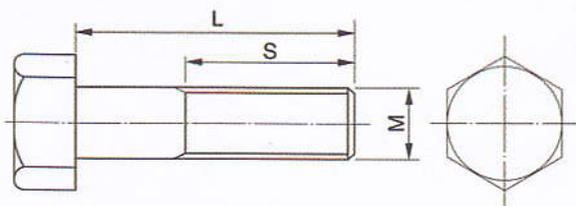


No.	Parts	Materials
①	Flange	FCD450/SS400
②	Bellows	Teflon
③	Control Ring	SUS304
④	Limit Bolt	SS400
⑤	Nut	SS400
⑥	Grommet	Synthetic Rubber
⑦	Flat Washer	SS400

- Flanges on ANSI, BS, etc. are available. The flange material can be changed to SUS304. Please consult us.
- Flange material for only 20A : SS400

• Installation Bolts

Please use the following limit bolts for installation.



JIS B 0205 (Metric Coarse Screw Thread)

Nominal Dia.(A)	Installation Bolt Size (mm)	Nominal Dia.(A)	Installation Bolt Size (mm)
20	M12x30L	100	M16x45L
25	M16x30L	125	M20x50L
32	M16x35L	150	M20x50L
40	M16x35L	200	M20x60L
50	M16x35L	250	M22x60L
65	M12x40L	300	M22x60L
80	M16x40L	-	-

Data are based on the thickness of JIS10K standard flanges and gaskets are not included.

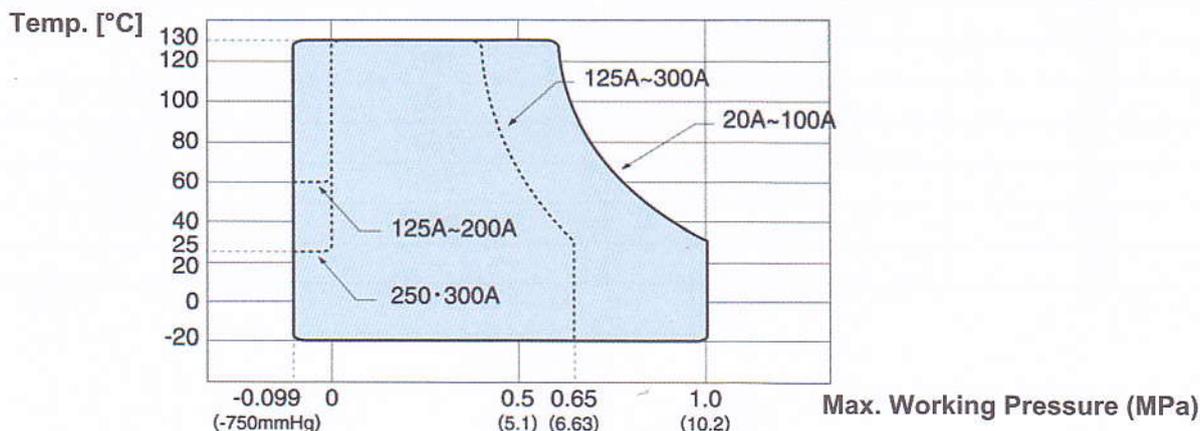
• Dimension and Allowable Movement

Nominal Dia. (A)	Dimension (mm)					Mass (kg)	Allowable Movement (mm)				Installation Tolerance (mm)			
	L	ØA	Ød	t	G		T.M.	A.E.	A.C.	A.M.(°)	T.M.	A.E.	A.C.	A.M.(°)
20	44	50	24	1.3	71	1.3	6	13	13	14	3	3	3	5
25	44	50	24	1.3	84	1.5	6	13	13	14	3	3	3	5
32	49	62	31	1.3	89	1.8	6	13	13	14	3	3	3	5
40	51	70	37	1.4	91	1.9	6	13	13	14	3	3	3	5
50	68	88	48	1.9	102	3.1	10	19	19	14	4	3	3	5
65	77	104	61	2.0	115	4.1	10	19	19	14	4	3	3	5
80	85	120	72	2.1	122	4.2	13	25	25	14	5	5	5	5
100	85	145	96	2.4	129	5.9	13	25	25	14	5	5	5	5
125	100	175	118	2.5	160	10	13	25	25	14	5	5	5	5
150	100	205	143	2.9	175	12	14	29	29	14	6	6	6	5
200	133	255	194	3.0	197	18	14	29	29	14	6	6	6	5
250	170	305	234	3.0	235	25	14	29	29	14	6	6	6	5
300	190	355	282	3.0	260	30	14	29	29	14	6	6	6	5

T.M. = Transverse Movement
A.E. = Axial Elongation
A.C. = Axial Compression
A.M. = Angular Movement

- Mass indicates only the case of JIS 10K flanges.
- Use the products within the given allowable movements.
- Installation tolerances are included in the allowable movements.
(Allowable movements = Tolerances for installation + Operating movements)
- Please note that information in the above table are for single movement only. In case of complex movements, some correction is required.

• Operating Condition



• Notes

- Information in the above table is for single movement only. In case of complex movements, follow the below expression.

$$C.EL(C) = A.EL(C) \times \left\{ 1 - \frac{(A.T.M. - T.M.) \times (A.A.M. - A.M.)}{A.T.M. \times A.A.M.} \right\}$$

C.EL(C) = Correct Elongation (Compression)
A.EL(C) = Allowable Elongation (Compression)
A.T.M. = Allowable Transverse Movement

T.M. = Transverse Movement
A.A.M. = Allowable Angular Movement
A.M. = Angular Movement

- Install the joint according to the above given allowable dimensions.

• Tightening Torque for Installation Bolts

Please tighten the installation bolts with the following torque.

Nominal Dia. (A)	Tightening Torque N·cm (kgf·cm)	Nominal Dia. (A)	Tightening Torque N·cm (kgf·cm)
20-25	1764 (180)	125	6566 (670)
32-40	2450 (250)	150	8134 (830)
50	3430 (350)	200	6566 (670)
65	4018 (410)	250	9506 (970)
80	2646 (270)	300	7840 (800)
100	4018 (410)	-	-

• Installation Instructions

- All pipe lines should be properly supported so that the expansion joints do not carry any pipe load.
- Do not remove the protecting board attached to the FLONEX until actual installation. If the protecting board is removed for a long time, the flare face of the joint may curve irregularly. Meanwhile, dust, dirt or other foreign objects may enter into the bellows.
- Clean the flare face of the expansion joints. Remove all dirt, burrs and sharp edges from the counter flanges by means of file or sandpaper.
- Bolts should not stuck out more than 3mm. from the reverse side of the flanges.
- Bolts should be tightened equally by alternating around the flange.
- Limit bolts and nuts are pre-set. Do not remove or adjust without any specific instructions.
- Clean all foreign objects from the corrugation of the bellow, especially any objects found around the control rings.
- Any detachment of the expansion joints must be performed under 100°C. Attach the protecting board to the flare face of the bellow.
- Pay attention to protect the expansion joints from damage by heat or welding sparks.
- Limit bolts are pre-set at the factory to fix the maximum overall length of FLONEX. In case the limit bolts are used as tie rods in the condition of insufficient pipe support, please apply them under the following pressure as maximum pressure.

Nominal Dia.(A)	Max. Pressure (kgf/cm ²) 3-Bellows
20	7
25	7
32	7
40	7
50	7
65	7
80	7

Nominal Dia.(A)	Max. Pressure (kgf/cm ²) 3-Bellows
100	7
125	7
150	7
200	4.5
250	4.5
300	4.5
-	-

All details are subject to change without prior notice.

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FJT series

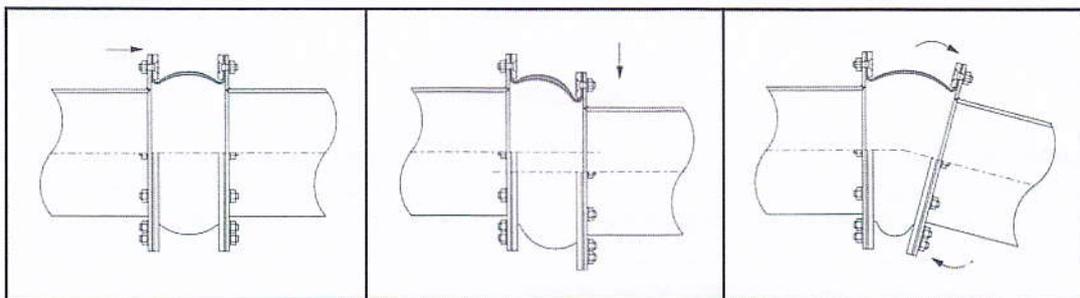
FABRIC EXPANSION JOINT



PURPOSE & APPLICATION

Expansion joints are important components in industrial plants. They are installed as flexible connections in pipe and duct systems to compensate for vibrations, thermal expansion, installation misalignments and torsion.

Fabric expansion joints are very flexible and accommodate movements in the duct systems in several directions and combinations.



Fabric expansion joints are used in :

- Coal, gas and oil -fired power stations
- Gas turbine and combined cycle plants
- Chemical and Petro-chemical industries
- Refinery
- Offshore
- Cement works
- Smelting works
- Pulp & Paper industries
- Any other plants where thermal expansion occurs.

DESIGN SPECIFICATION

The individual expansion joint is designed on the basis of :

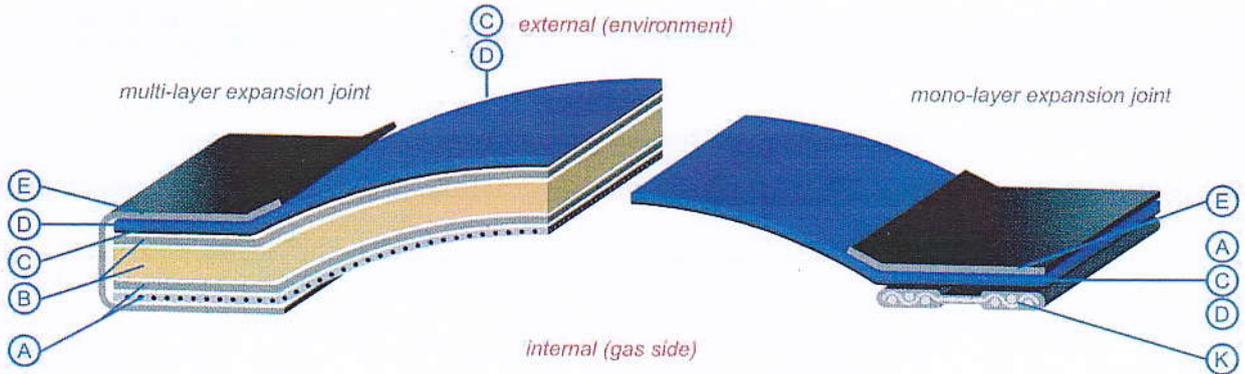
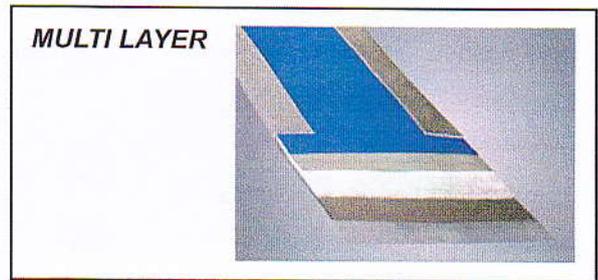
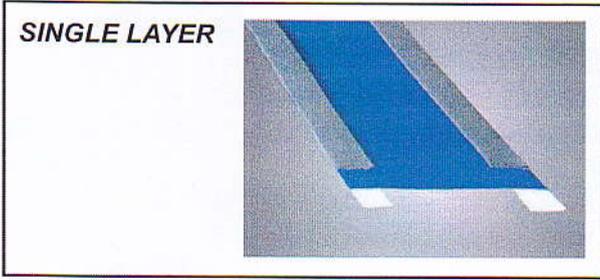
- Movement in the duct system (axial, lateral, angular, torsion)
- Design and operating temperature of the plant
- Design and operating pressure of the plant
- Composition of the flue gas
- Special requirements with regard to installation
- Gas velocity
- Dust content, fly ash, etc.

Each individual material layer of the expansion joint fulfills a specific requirement, determined by the joint's location in the duct system of the individual plant.

Within the temperature range of -65° C to + 1400° C, the individual types of expansion joints are custom-made to suit the required application, with regard to :

- Choice of materials and composition
- Fastening or tightening method
- Steel parts and steel quality
- Insulation (bolster)
- Mechanical protection against abrasion (sleeve arrangement)
- Fabric expansion joint alone or pre-assembled on steel parts

Tozen have defined a number of standard types of expansion joints, which suit 85% of all applications, i.e. standard types that can be used for certain temperatures, media, or familiar operating conditions, with only very few adjustments. The standard types can be manufactured to order in all the necessary shapes and forms according to customer drawing, e.g. round, rectangular, oval, conical or combinations.



- A - Containing layers
- B - Thermal damping layer
- C - Chemical resistance layer and outer-cover

- D - Chemical resistance layer and outer-cover
- E - Closing layer and edge reinforcement
- K - Flanging area sealing gasket (gas/tight)

VARIOUS SHAPES OF FABRIC EXPANSION JOINT



For any other shapes, please consult us.

SERVICE

Our products are designed to ensure easy assembly on the building site. We do, however, provide excellent Customer Service thanks to Tozen installation engineers specialized team, capable of working alongside and supporting the customer during the various phases of the assembly of an expansion joint.

Training courses on the installation and splicing of our expansion joints are also provided.



"It is absolutely essential to have the right joint in the right place, but it must, of course, be installed correctly!"

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