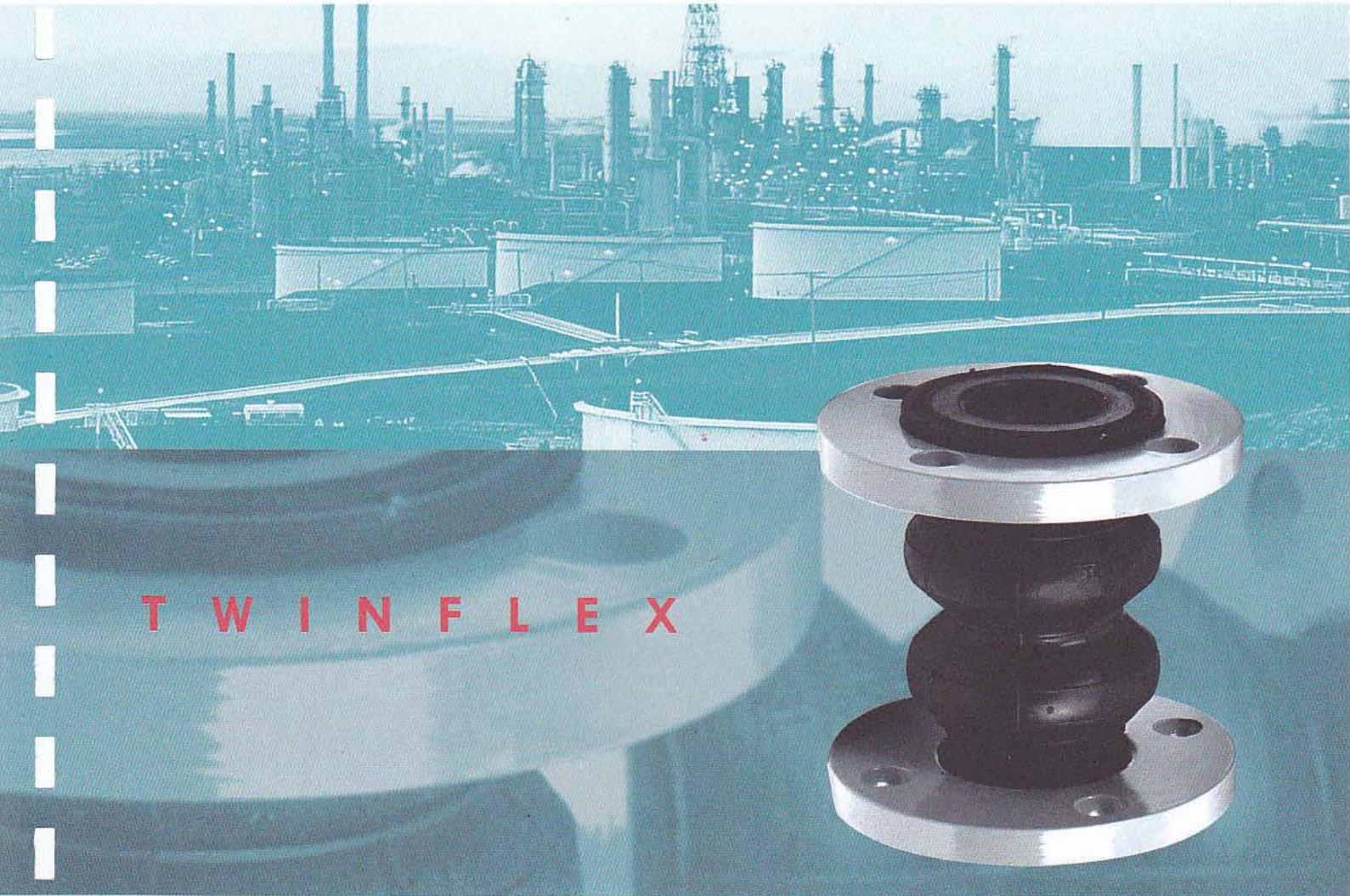
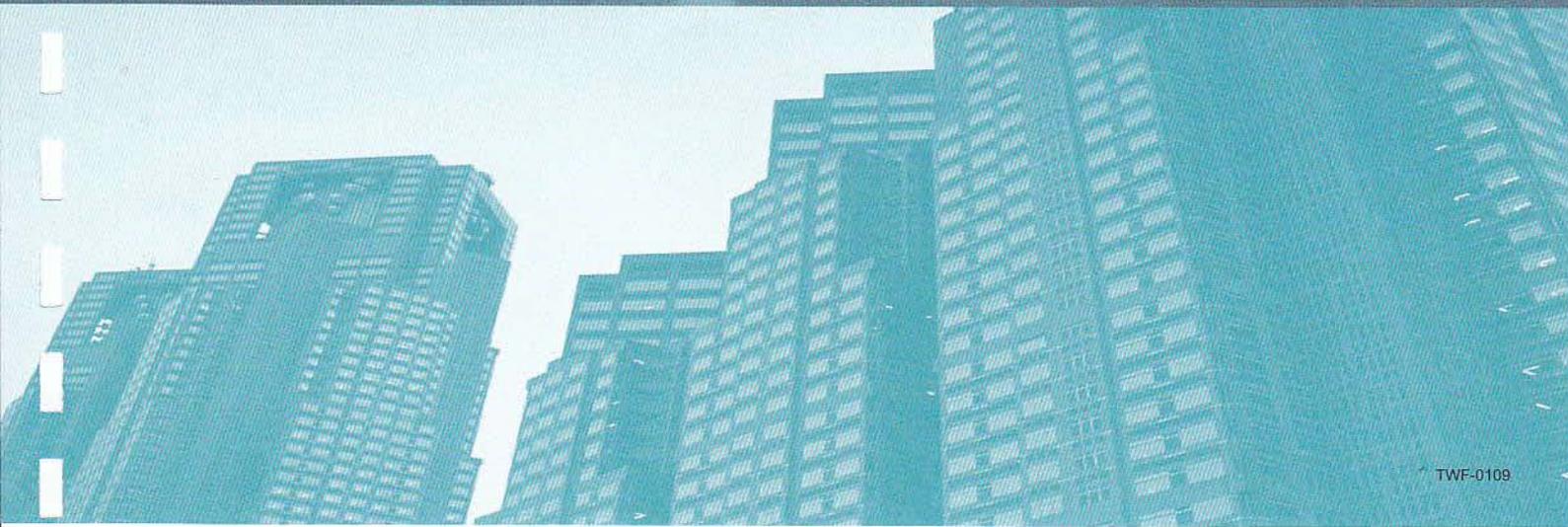


TWINFLEX

FLEXIBLE RUBBER JOINT



T W I N F L E X



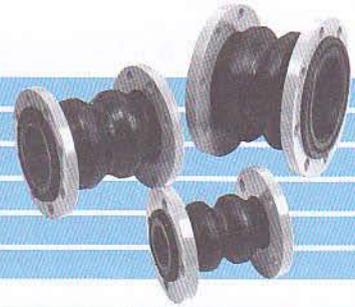
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TWINFLEX

TWIN-SPHERE RUBBER JOINT with floating flanges



FEATURES

- Resistance High Pressure : The excellent molding technique, combined with tough chemical fibers, give TWINFLEX an outstanding pressure withstandability. It can withstand the bursting pressure of over 780psi. (55kgf/cm²) and the max. working pressure of 300psi. (20kgf/cm²)
- Allow large compression, elongation, and angular movement.
- Fit for suction and delivery (discharge).
- Outstanding in absorbing thermal expansion.
- Highly effective to eliminate sound and vibration.
- Excellent in resisting the effects of heat, water and weathering, etc.
- Other advantages :
 1. Neither gasket nor packing is needed.
 2. Mass production makes comparatively low prices possible.
 3. Fit for use as both expansion and flexible joint.
 4. A good insulator to electricity.

TYPICAL APPLICATIONS

- 1) Pressure piping systems for water and warm water used in building equipment and general industrial plants, etc.
- 2) Pump lines and turbine lines used for power generation plants, industrial machinery and universal pump, blowers, etc.
- 3) Feed-water and drainage lines for waterworks, sewerage and sanitary piping system, etc.

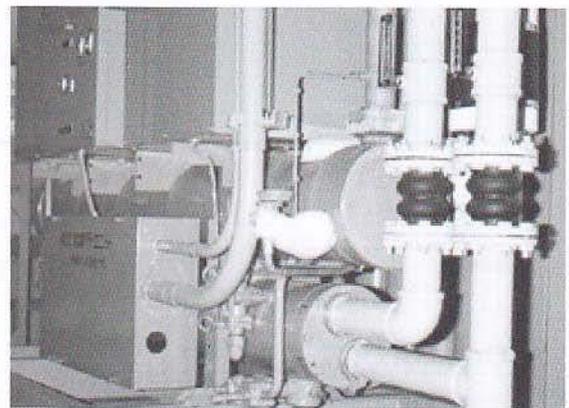
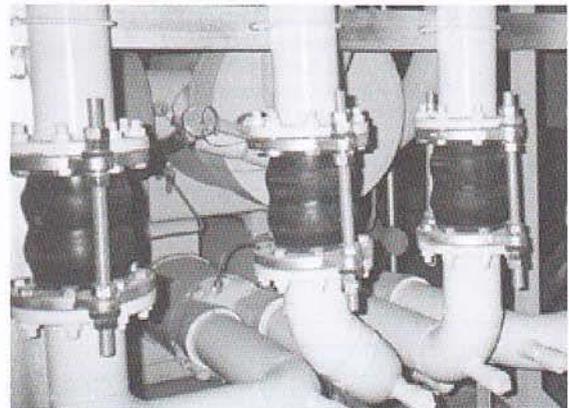
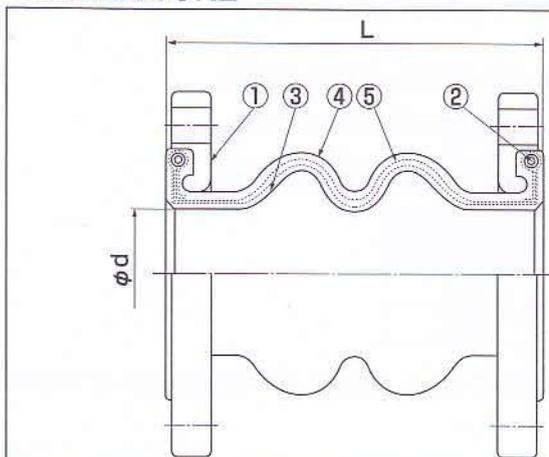
Others : This connector has wide range of applications in waste water disposal plants, mines and chemical plants, etc.

**** Please note that TWINFLEX is not applicable to oils, circulation pumps for pool water, air, gases and hot water supply line. ****

APPLICABLE FLUID

- Applicable Fluid : water, warm water, sea water, weak acids, alkalines, etc.
- Other kinds of fluids may be applicable with the change of the composition or constituents of rubber. For details, please consult us.

STRUCTURE



No.	Parts	Materials
1	Flange	FCD450, SS400
2	Reinforcing Ring	Carbon Steel (SWRH)
3	Inner Rubber	Synthetic Rubber
4	Outer Rubber	Synthetic Rubber
5	Reinforcing Cord	Synthetic Fiber
- Standard item employs JIS10K flange. May be replaced with ANSI, BS, DIN, and other standard (drilling). - Standard rubber is Neoprene. EPDM and other rubbers are available upon request.		

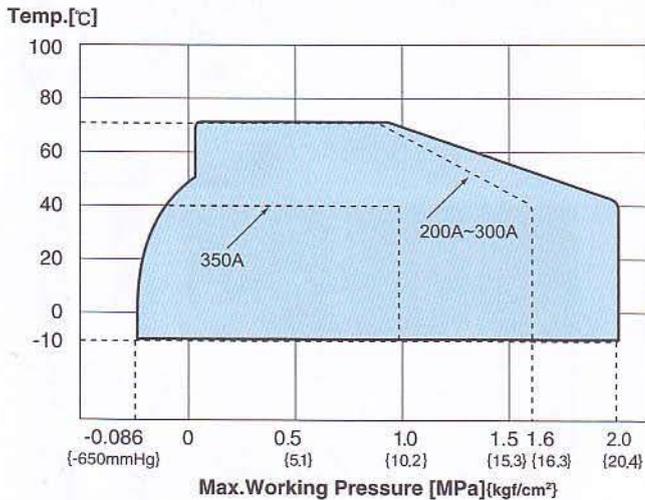
● Dimension and Allowable Movement

Nominal Dia. (A)	Dimension (mm)		Allowable Movement (mm)				Installation Tolerance (mm)			
	L	Ød	T.M.	A.E.	A.C.	A.M.(°)	T.M.	A.E.	A.C.	A.M.(°)
32	175	40	20	10	20	30	8	3	6	10
40	175	40	20	10	20	30	8	3	6	10
50	175	50	20	10	20	30	8	3	6	10
65	175	65	20	10	20	30	8	3	6	10
80	175	75	20	10	20	30	8	3	6	10
100	225	100	25	15	30	30	10	3	6	10
125	225	125	25	15	30	30	10	3	6	10
150	225	150	25	15	30	30	10	3	6	10
200	325	200	30	20	40	30	12	3	6	10
250	325	250	30	20	40	30	12	3	6	10
300	325	300	30	20	40	30	12	3	6	10
350	250	350	15	15	20	15	6	3	6	10

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

- Use the products within the given allowable movements.
- Tolerances for installation are included in the allowable movements (Allowable movements = Tolerances for installation + Operating movements)
- Although allowable movements are given, no allowance for elongation is recommended when installing the joint.

● Operating Condition



- **Normal Working Pressure (at normal temp) :**
 Below size 150A : Max 2.0 Mpa at normal temp.
 Size 200A to 300A : Max 1.6 Mpa at normal temp.
 Size 350A : Max 1.0 Mpa at normal temp.
- **Bursting Pressure :**
 Below size 150A : 5.0 Mpa (51 kgf/cm²) or above at normal temp.
 Over size 200A : 3.5 Mpa (35.7 kgf/cm²) or above at normal temp.
- **Working Temperature :**
 Below size 300A : -10 to 70 deg.C.
 Size 350A : -10 to 40 deg.C.
 *For high temp. application, please consult us. *

● Control Unit

In case of the following conditions, control unit is recommended to use for protection of connectors.

- In case that it is hard to support reaction force (thrust) by pressure during the test operation or normal operation.
- In case that lateral movement is anticipated more than the designed movement.
- In case that the connectors are anticipated to be compressed when installation.

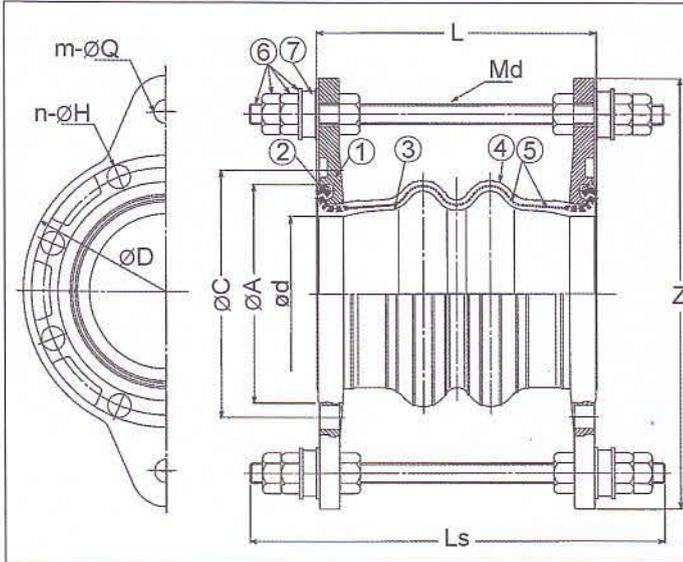
When control units are required to assist with the installation of joint, refer to the below table.

Max Working Pressure	Size			
	32-100A	125A	150-300A	350A
10 kgf/cm ²	No	No	Yes	Yes
16, 20 kgf/cm ²	No	Yes	Yes	N/A

Control units for Twinflex can be either back-plate type or integrated type. Next is the illustration of Twinflex Integrated Type. For back-plate type, please consult us.

Twinflex Integrated Type

• Structure



No.	Parts	Materials
1	Flange	FCD450
2	Reinforcing Ring	Carbon Steel (SWRH)
3	Inner Rubber	Synthetic Rubber
4	Outer Rubber	Synthetic Rubber
5	Reinforcing Cord	Synthetic Fiber
6	Bolt, Nut, Washer	Mild Steel
7	Bushing	Hard Rubber

- Standard item employs ANSI150 and JIS10K flanges.
- Standard rubber is Neoprene. EPDM and other rubbers are available upon request.

• Dimension (mm)

Nominal Dia. (A)	L	$\varnothing A$	$\varnothing d$	Ls	ANSI150LB		JIS10K	
					m- $\varnothing Q$ (Md)	Z	m- $\varnothing Q$ (Md)	Z
32	175	80	40	320	2-23 (M20)	247	2-23 (M20)	255
40	175	80	40	320	2-23 (M20)	257	2-23 (M20)	260
50	175	96	50	320	2-23 (M20)	262	2-23 (M20)	295
65	175	115	65	320	2-23 (M20)	308	2-23 (M20)	315
80	175	125	75	320	2-23 (M20)	321	2-23 (M20)	325
100	225	152	100	380	2-23 (M20)	359	2-23 (M20)	350
125	225	182	125	380	2-23 (M20)	384	3-23 (M20)	390
150	225	212	150	380	2-23 (M20)	419	3-23 (M20)	420
200	325	263	200	480	2-23 (M20)	483	4-23 (M20)	470
250	325	322	250	480	4-23 (M20)	546	4-23 (M20)	540
300	325	370	300	480	4-23 (M20)	623	4-23 (M20)	585

- Please follow ANSI or JIS standard for $\varnothing D$, $n-\varnothing H$, and $\varnothing C$.
- For other dimensions, allowable movements, and operating conditions, please refer to the previous table and graph.

• Notes

1. Information in the above table is for single displacement only. In case of complex displacement, follow the below expression.

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

C.EL(C) = Correct Elongation (Compression)
T.M. = Transverse Movement
A.EL(C) = Allowable Elongation (Compression)
A.A.M. = Allowable Angular Movement
A.T.M. = Allowable Transverse Movement
2. Install the joint according to the above given allowable dimensions.
3. Do not install joints at full limits of all allowable movements simultaneously.
4. Always check suitability of the operating conditions when installation of the joint.
5. Before installation of the joint, check any cracks on rubber body surface, especially after a long period storage.
6. In case of the joint movements, pay attention for rubber body not to be damaged by external objects (especially those with sharp edge).
7. Keep joints away from heat when installation. Cover the joint with protection sheet to free from any harm of sparks resulted from welding, prearcng and grinding near the spot of installation.
8. Avoid direct exposure to sunlight for outdoor piping to prevent aging and deterioration of rubber.
9. If oil, fat, organic solvent (like thinner, toluene), acid or alkali are adhered, wipe them off quickly.
10. To avoid elongation of the joint by reaction force resulted from water pressure, fix pipes before and after the joint.



CAUTION

-Operating conditions in this catalog have been developed from our design calculation, in-house testing, field reports provided by our customers and/or published official standards or specifications. They are a general guideline to user of TOZEN products. For any specification application, please contact us.
*Any information provided in the catalog is subject to change without notice.



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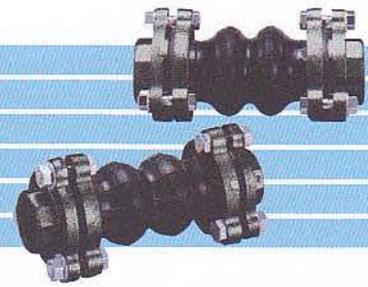
ที่อยู่ บริษัท 36/8 หมู่ที่3 ซอยฉิมพลี21 ถนนบรมราชชนนี แขวงฉิมพลี เขตตลิ่งชัน
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TWINFLEX Screwed Type

FLEXIBLE RUBBER JOINT



FEATURES

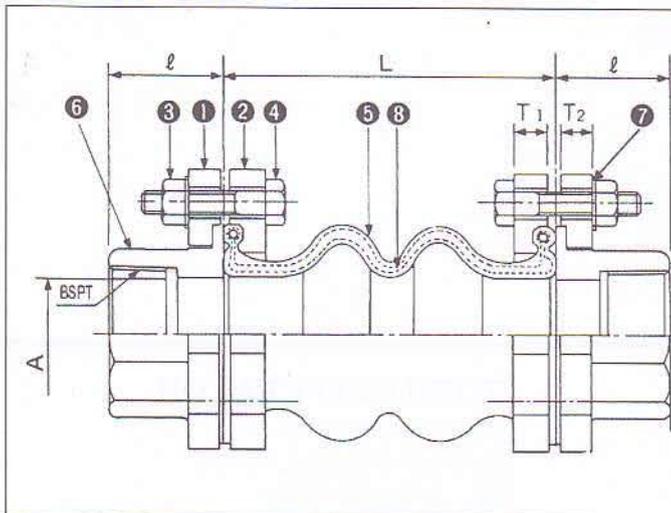
TWINFLEX Screwed Type Rubber Joint can afford large deflection that you can hardly imagine. It has various functions and are highly reliable. Followings are the main features :

- **High Efficiency for Vibration and Noise Isolation**
The twin sphere makes the spring constant small, decreases the body natural frequency and increases the efficiency of vibration absorption.
- **Withstandability**
It can withstand a bursting pressure of over 780 psi. Rubber body with maximum working pressure of 250 psi and with the combination of excellent formative technique and strong chemical fibre.
- **Large Displacement Absorption for Eccentricity, Axial Movement and Angular Movement**
Since it can absorb large displacement, TWINFLEX screwed type flexible rubber joint is most appropriate for the protection of pipe line system. For example, it can prevent the destruction of connecting pipe due to earthquake and subsidence of ground.
- **Applicable for both Suction and Delivery**
The joint fits for both suction and delivery.
- **Highly Reliable**
The packing parts are strengthened with steel reinforcing rings to prevent the rubber body from slipping out of the fitting sides of flanges.
- **Convenient to install**
When limited space is allowed for installation, the free type sockets can be screwed separately to pipe before fitting in the joint.

APPLICATIONS

- Vibration isolation for small pumps and circular pumps.
- Sewage disposal purifier line.
- Vibration isolation for air-conditioners and pipes.

STRUCTURE



No.	Parts	Materials
1	Flange-A	FCD400
2	Flange-B	FCD400
3	Nut	SS400
4	Bolt	SS400
5	Rubber	Synthetic Rubber
6	Union Edge	FCD400
7	Washer	SS400
8	Reinforcing Cord	Synthetic Fiber

- Standard rubber material is Neoprene.
- It is producible for oil application by changing the rubber material. Please consult us.
- Please use U-FLEX for hot water supply.

● Dimension and Allowable Movement

Nominal Bore	Size (mm)			Allowable Movement (mm)				Installation Allowance (mm)			
	A	L	ℓ	T.M.	A.E.	A.C.	A.M.(°)	T.M.	A.E.	A.C.	A.M.(°)
15mm (1/2")	25	120	30	15	10	15	20	6	3	4	10
20mm (3/4")	25	120	30	15	10	15	20	6	3	4	10
25mm (1")	25	120	30	15	10	15	20	6	3	4	10
32mm (1 1/4")	40	175	35	20	10	20	30	8	3	6	10
40mm (1 1/2")	40	175	35	20	10	20	30	8	3	6	10
50mm (2")	50	175	40	20	10	20	30	8	3	6	10

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

● Operating Condition

- **Max. Working Pressure** : 150 psi.
- **Bursting Pressure** : 780 psi. (55 kgf/cm²) or above at normal temp.
- **Working Temperature** : -10 to 70 deg. C.
* For high temp. application, please consult us. *

● Notes

1. Information in the above table is for single displacement only. In case of complex displacement, follow the below expression.

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

C.EL(C) = Correct Elongation (Compression)

T.M. = Transverse Movement

A.EL(C) = Allowable Elongation (Compression)

A.A.M. = Allowable Angular Movement

A.T.M. = Allowable Transverse Movement

A.M. = Angular Movement

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

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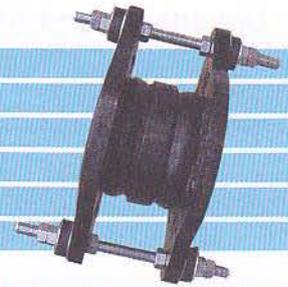
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TWINFLEX 20

FLEXIBLE RUBBER JOINT



FEATURES

- **High Pressure Application** : Twinflex20 is used in pressurized piping systems where noise and vibration isolation and expansion compensation are necessary. Since the rubber reinforcement with strong chemical fiber is shaped through newly developed technology, the normal working pressure range is (-0.08Mpa) ~ 1.96Mpa (-600mmHg~20kgf/cm²) and bursting pressure is more than 5.39Mpa (55kgf/cm²). Twinflex20 flexible joint is especially suitable for high-pressure application.
- **Excellent Tightness** : Since the rubber face which is fastened to the metal flange is shaped by a new process, it has excellent water and air tightness.
- **Control Unit Integrated Flange** : The standard design of Twinflex20 comes with Control-Unit-Integrated FCD400 flanges. This is a cheaper solution for applications requiring control units than the traditional Back Plate type. In case of rigidly anchored piping systems where control units may not be needed, ordinary flanges are also available upon request.
- **Outstanding Vibration and Noise Absorption** : Twin sphere structure significantly reduces vibration and noise transmission from operating equipment to the piping system because the joints acts as a damper which absorbs the greatest percentage of vibration and noise.
- **Other Advantages** :
 - The packing and gasket are not required.
 - Applicable both as expansion joint and flexible joint, and also applicable for both purposes concurrently.
 - Low electrical conductivity.
 - Mass production makes comparatively low price possible.

APPLICATIONS

- Chilled water air conditioning equipment, water pumps, sewerage and sanitary piping systems, etc.
- Pressure piping systems for water and warm water used in building equipment and general industrial plants, etc.
- Pump line and turbine lines used for power generation plants, industrial machinery and universal pump blowers, etc.

STRUCTURE

No.	Parts	Materials
1	Integrated Flanges	Cast Iron (FCD400)
2	Reinforcing Ring	Carbon Steel (SWRH)
3	Inside Rubber	Synthetic Rubber
4	Outside Rubber	Synthetic Rubber
5	Reinforcing Fiber	Synthetic Fiber
6	Bolts, Nuts, Washer	Mild Steel (SS400)
7	Bushing	Hard Rubber

- Ordinary flange material can be provided to FCD400, mild steel or SUS304.
 - Available flange standards are JIS, ANSI, BS, DIN and others (drillings).
 - Synthetic rubber is EPDM which is the standard material. (Other kinds of rubber material are optional.)
 - Structure of vacuum ring will be added for alternative to withstand full vacuum.

● Dimension and Allowable Movement

Size (mm)	Dimension (mm)			Allowable Movement (mm)				Installation Allowance (mm)			
	L	ØD2	ØD1	T.M.	A.E.	A.C.	A.M.(°)	T.M.	A.E.	A.C.	A.M.(°)
150	175	212	150	20	20	30	20	8	6	6	5
200	200	264	200	20	20	30	15	8	6	6	5
250	200	324	250	20	20	30	10	8	6	6	3
300	200	372	300	20	20	30	10	8	6	6	3

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

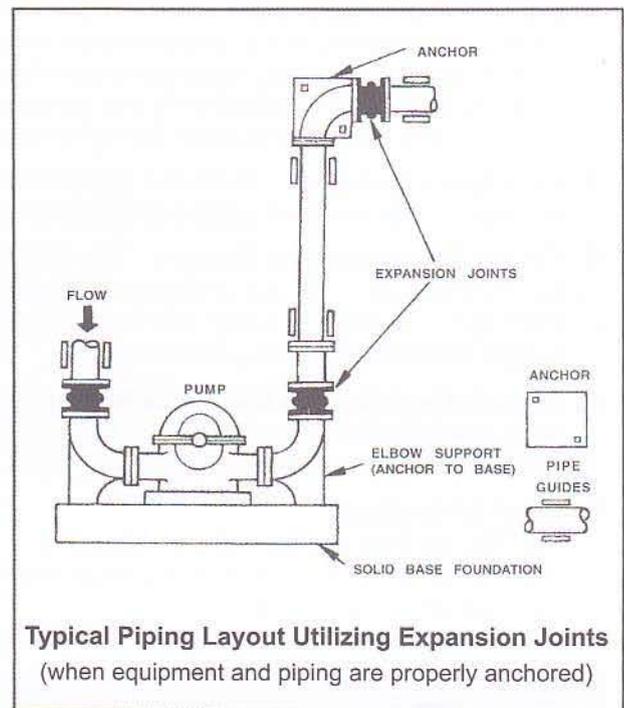
● Operating Condition

Max Working Pressure : 20 kgf/cm² (1.96Mpa)
 Negative Pressure : -600 mmHg. (-0.08Mpa)
 Working Temperature : -10°C ~ +80°C
 Applicable Fluid : Water, Sea Water,
 Warm Water, Weak Acid,
 Weak Alkali, etc.

● Control Units

Control units are not required for piping systems with rigidly anchored supports on both sides of a flexible joint. The rigidly anchored supports must be capable of withstanding pressure thrusts generated by the internal pressure or wide temperature fluctuations.

Control units are always recommended to be used with Twinflex20 for unanchored piping systems, non-rigidly anchored system, and piping systems connected to spring mounted equipment. Furthermore, control units are always recommended to prevent movements beyond Twinflex20's limited specification.



Typical Piping Layout Utilizing Expansion Joints
 (when equipment and piping are properly anchored)

● Notes

1. Information in the above table is for single displacement only. In case of complex displacement, 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)

T.M. = Transverse Movement

A.EL(C) = Allowable Elongation (Compression)

A.A.M. = Allowable Angular Movement

A.T.M. = Allowable Transverse Movement

A.M. = Angular Movement

2. Install the joint within the range of installing allowance. Do not install joints at full limits of all allowable movement simultaneously.
3. In order to avoid elongation of the joint by the reaction force resulted from water pressure, fix pipes before and behind the joint. If the fixing of the pipes is not sufficient, install the tie rods (control unit) to the joints for protection.
4. Fix the bolts and nuts on the counter flange side (external side).
5. When installing the joint, check for cracks on rubber body surface, especially after a long period of storage.
6. Keep away from heating source when install. Cover the joint with protection sheet to free from any harm of spark resulted from welding, pre-arcing and grinding near the spot of joint installation.
7. If oils, fats, organic solvent (e.g. thinner, toluene), acid or alkali are adhered, wipe them off quickly.
8. Avoid direct exposure of sunlight in case of outdoor piping to prevent aging and deterioration of rubber.

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