TOZEN
*A joint reliance*

# TWINFLEX

## FLEXIBLE RUBBER JOINT


# TWINFLEX

## FLEXIBLE RUBBER JOINT

**Twin-Sphere Rubber Joint with Floating Flanges**

## Features

### ●High pressure resistance

Combining the latest molding techniques and extremely tough synthetic rubber fiber, TWINFLEX can be safely used up to a maximum working pressure of 300 psi (20kgf/cm²) and a rupture pressure of 780 psi (55kgf/cm²).

TWINFLEX can also withstand a considerable vacuum force, making it ideal for use at the suction and delivery ends of a fluid distribution system.

### ●Large Compression, Elongation and Angular Movement

### ●Fit for suction and delivery (discharge)

### ●Additional Features and Benefits

1) Additional gaskets and/or packing are not required.
2) Simplified installation in all piping systems using easy alignment flanges.
3) Ability to absorb considerable elongation and compression of pipes caused by temperature changes prevents piping system breaks and equipment down time.
4) Absorbs the force created by pulsating water and reduces the effect of water hammer.

## Typical Applications

1) Cold and warm water pressure piping systems in commercial and industrial buildings and plants.
2) Pump and turbine piping used for power generation plants, industrial machinery and pump blowers.
3) Feed-water and drainage piping for water, waste-water, and sanitary systems.

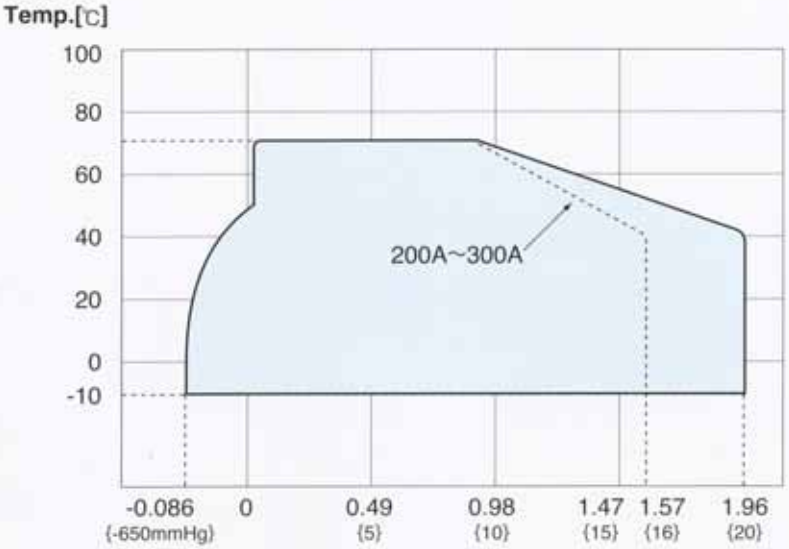
**Note:TWINFLEX is not applicable for use with oil, air, gases, hot water supply lines and with pool water.**

## ■Control Unit

**Use of the Control Unit option is recommended for the following conditions:**

- Adequate piping support can not be provided to counteract pressure forces.
- Whenever transverse movement is expected that may exceed design specifications.
- If there is a possibility that the joint will operate in a compression mode.

## ■Operating Conditions




**●Nomal working pressure :**

Below 150A size : Max. 20kgf/cm² at normal temp.
Over 200A size : Max. 16kgf/cm² at normal temp.

**●Working tempreture :**

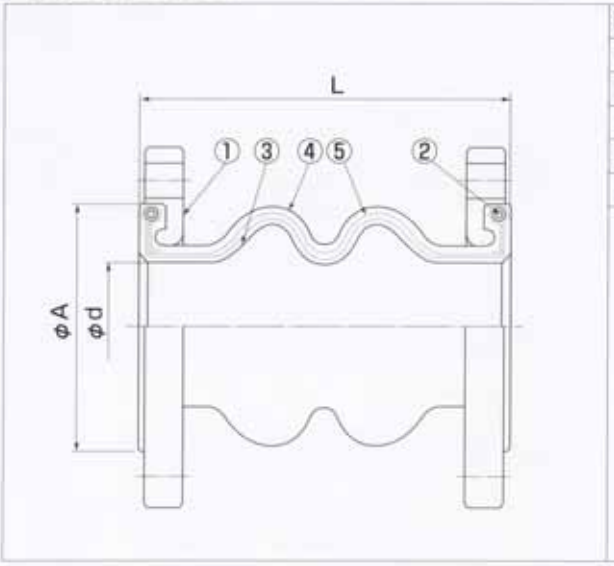
−10 to 70 deg. C.

**●Bursting pressure :**

55kgf/cm² (780p.s.i.) or above at normal temp.

＊For high temp. application, please consult us.

## ■Construction




| No. | Parts | Materials |
|---|---|---|
| ① | Flange | Ductile Iron (FCD 450) |
| ② | Reinforcing Ring | Carbon Steel (SWRH) |
| ③ | Inner Rubber | Synthetic Rubber |
| ④ | Outer Rubber | Synthetic Rubber |
| ⑤ | Reinforcing Cord | Synthetic Fiber |

●Flanges on ANSI, BS, etc. available.
The flange material can be changed to Mild Steel, SUS304 and SUS316. Please consult us.

## ■Dimensions and Allowable Movements

| Nominal Dia. (A) | Dimensions (mm) | | | Mass (kg) | Allowable Movements (mm) | | | | Installation Tolerances (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | φA | φd | | T.M. | A.E. | A.C. | A.M. (°) | T.M. | A.E. | A.C. | A.M. (°) |
| 32 | 175 | 80 | 40 | 2.9 | 20 | 10 | 20 | 30 | 8 | 3 | 6 | 10 |
| 40 | 175 | 80 | 40 | 3.3 | 20 | 10 | 20 | 30 | 8 | 3 | 6 | 10 |
| 50 | 175 | 96 | 50 | 3.9 | 20 | 10 | 20 | 30 | 8 | 3 | 6 | 10 |
| 65 | 175 | 115 | 65 | 5.2 | 20 | 10 | 20 | 30 | 8 | 3 | 6 | 10 |
| 80 | 175 | 125 | 75 | 5.3 | 20 | 10 | 20 | 30 | 8 | 3 | 6 | 10 |
| 100 | 225 | 152 | 100 | 6.8 | 25 | 15 | 30 | 30 | 10 | 3 | 6 | 10 |
| 125 | 225 | 182 | 125 | 10.0 | 25 | 15 | 30 | 30 | 10 | 3 | 6 | 10 |
| 150 | 225 | 212 | 150 | 14.0 | 25 | 15 | 30 | 30 | 10 | 3 | 6 | 10 |
| 200 | 325 | 263 | 200 | 18.0 | 30 | 20 | 40 | 30 | 12 | 3 | 6 | 10 |
| 250 | 325 | 322 | 250 | 27.0 | 30 | 20 | 40 | 30 | 12 | 3 | 6 | 10 |
| 300 | 325 | 370 | 300 | 30.0 | 30 | 20 | 40 | 30 | 12 | 3 | 6 | 10 |

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

●Mass indicates only the case with JIS 10K (FCD450) flanges.
●Use the products within the given allowable movements.
●Tolerances for installation are included in the allowble 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.

## ■Notes

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

2. Install the joint according to the specified allowable dimensions.

3. Check suitability of joint to operating conditions prior to installation.

4. Prior to installation, check for cracks on the rubber body surface, especially after extended storage.

5. If there is movement in the joint, insure that the rubber joint body is not damaged by external objects.

6. Keep joint away from all sources of heat. If necessary, cover the joint with a protective sheet to restrict damage caused by welding sparks, grinding, etc.

7. Avoid contact of the rubber body with oils, fats, organic solvents (thinner, toluene, etc.), acid or alkali. Wipe immediately if rubber is contaminated with these items.

8. Secure piping before and after joint to limit elongation of the joint during operation.

# CAUTION

Operating conditions and other performance data published 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 good only to cover typical applications as a general guildeline to users of TOZEN products introduced in this catalog.

For any specific application, users are kindly requested to contact TOZEN CORPORATION for technical advice, or to carry out their own study and evaluation for providing suitability of these products to such an application. Failure to follow this request could result in property damage and/or personal injury, for which we shall not be liable.

While this catalog has been compiled with the utmost care, we assume no responsibility for errors, impropriety or inadequacy. Any information provided in this catalog is subject to from-time-to-time change without notice for error rectification or, products discontinuation, design modification, new products introduction or any other cause that TOZEN CORPORATION considers necessary. This edition cancels all previous issues.

※ The contents of this literature are subject to change without notice.

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# DYNAFLEX

## FLEXIBLE SINGLE-SPHERE RUBBER JOINT with Floating Flange

### FEATURES

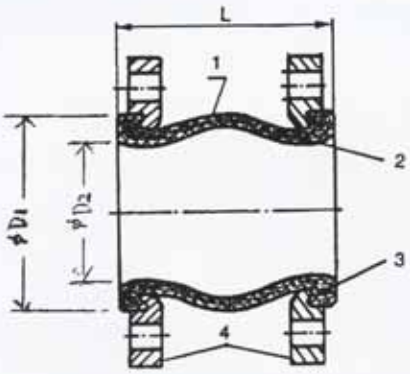
- Quality Products
  All joints are manufactured under a strict quality assurance system of IS09002 certified factory.
- Withstand high pressure
  An excellent moulding technique combined with tough chemical fibres gives DYNAFLEX an outstanding pressure withstandability. It can withstand a bursting pressure of over 4.90MPa {50kgf/cm²} and a maximum operating pressure of 1.47MPa {15kgf/cm²}.
- Fit for suction and delivery (discharge)
- 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 lower prices possible.
  (3) Fit for uses in both expansion and flexible joint.
  (4) A good insulator.

### TYPICAL APPLICATIONS

(1) Water piping systems of building equipment in industrial plants.
(2) Pump lines and turbine lines used in power generating plants, shipbuilding yards, industrial machinery and universal pump blowers, etc.
(3) Feed water and drainage lines for water works, sewerage and sanitary system, etc.

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

## STRUCTURE



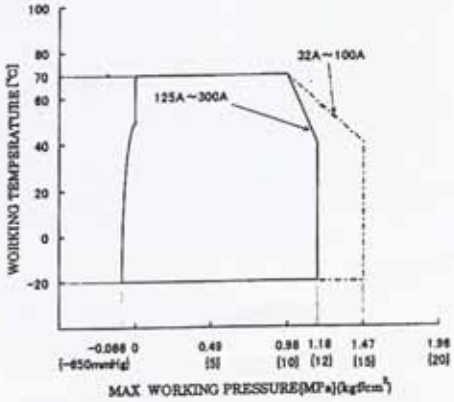

| No. | Part | Material |
|---|---|---|
| 1 | Flange | Mild Steel |
| 2 | Reinforcing Ring | Carbon Steel |
| 3 | Inner Rubber | Synthetic Rubber |
| 4 | Outer Rubber | Synthetic Rubber |
| 5 | Reinforcing Cord | Synthetic Fibre |

## DIMENSIONS

| | mm<br>in. | 32<br>(1.1/4) | 40<br>(1.1/2) | 50<br>(2) | 65<br>(2.1/2) | 80<br>(3) | 100<br>(4) | 125<br>(5) | 150<br>(6) | 200<br>(8) | 250<br>(10) | 300<br>(12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BODY | PLY | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 6 | 6 | 8 | 8 |
| | L | 95 | 95 | 105 | 115 | 135 | 150 | 165 | 180 | 190 | 230 | 245 |
| | øD1 | 76 | 76 | 86.5 | 106 | 118 | 146 | 182 | 212 | 264 | 324 | 372 |
| | øD2 | 40 | 40 | 50 | 60 | 72 | 100 | 125 | 150 | 200 | 250 | 300 |

## OPERATING CONDITIONS

Use DYNAFLEX under conditions specified in the below graph.




- Normal operating pressure :
  32~100 : Max. 1.47MPa {15kgf/cm² } in normal temperature
  125~300 : Max. 1.18MPa {12kgf/cm²} in normal temperature
- Operating temperature :
  -20 to +70ºC
- Bursting pressure :
  32~100 : over 4.90MPa {50kgf/cm²} in normal temperature
  125~300 : over 3.43MPa {35kgf/cm²} in normal temperature
- Applicable fluids : water, warm water, sea water, weak acids, alkalines, etc.

## ALLOWABLE MOVEMENTS IN OPERATION

| Nominal Bore | | T.M. | A.E. | A.C. | A.M. |
|---|---|---|---|---|---|
| mm | in. | (mm) | (mm) | (mm) | (°) |
| 32 | 1.1/4 | 8 | 5 | 8 | 15 |
| 40 | 1.1/2 | 8 | 5 | 8 | 15 |
| 50 | 2 | 9 | 6 | 10 | 15 |
| 65 | 2.1/2 | 10 | 7 | 13 | 15 |
| 80 | 3 | 11 | 8 | 14 | 15 |
| 100 | 4 | 12 | 10 | 18 | 15 |
| 125 | 5 | 12 | 11 | 19 | 15 |
| 150 | 6 | 14 | 12 | 19 | 15 |
| 200 | 8 | 22 | 14 | 25 | 15 |
| 250 | 10 | 22 | 14 | 25 | 15 |
| 300 | 12 | 22 | 16 | 25 | 15 |

1) T.M. = Transverse Movement A.C. = Axial Compression
   A.E. = Axial Elongation A.M. = Angular Movement
2) Although allowable movements are given, no allowance for elongation is recommended when installing joint.
3) Install joint following the given allowable dimensions.

## NOTES

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

$$C.\ EL\ (C) = \{A.EL(C)\} \times \frac{A.E. - E.}{A.E.} \times \frac{A.A.M. - A.M.}{A.A.M.}$$

C. EL (C) = Correct Elongation (Compression)
A. EL (C) = Allowable Elongation (Compression)
A.E. = Allowable Eccentricity
E. = Eccentricity
A.A.M. = Allowable Angular Movement
A.M. = Angular Movement

## NOTES

1. Always check for the suitability of operating conditions when install joints.
2. When install joints, check for cracks on the rubber part, especially after a long period of storage.
3. Do not install joints at full limits of all allowable movements simultaneously.
4. In case of joint displacement, be awared of external objects (especially those with sharp edges) which may damage the rubber body.
5. Keep away from heating source when install. Cover joints with protection sheet to free from any harm of spark resulted from welding, pre-arcing and grinding near the spot of joint installation.
6. If oils, fats, organic solvent, acid or alkali are adhered, wipe them off quickly.
7. Avoid direct exposure of sunlight in case of outdoor piping to prevent aging and deterioration of rubber.
8. During joint installation, fix pipes before and behind joints to avoid elongation to joints due to water pressure.
   In case fixing of pipes is not possible, control unit is required to prevent the joints from elongation.



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# TWINFLEX Screwed Type

## FLEXIBLE RUBBER JOINT

## Features

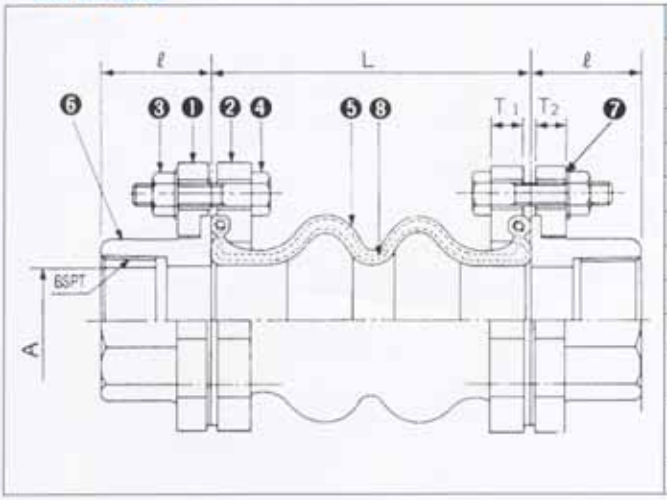
TWINFLEX Screwed Type Rubber Joint can afford large deflection that you can hardly imagine. It has various functions and are highly reliable. Followings are the main features :

- **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 5.39 MPa (55 kgf/cm$^2$) and a maximum working pressure of 1.6 MPa (16.3 kgf/cm$^2$) 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 | FCD450 |
| ② | Flange-B | FCD450 |
| ③ | Nut | SS400 |
| ④ | Bolt | SS400 |
| ⑤ | Rubber | Synthetic Rubber |
| ⑥ | Union Edge | FCD450 |
| ⑦ | Washer | SS400 |
| ⑧ | Reinforcing Cord | Synthetic Fibre |

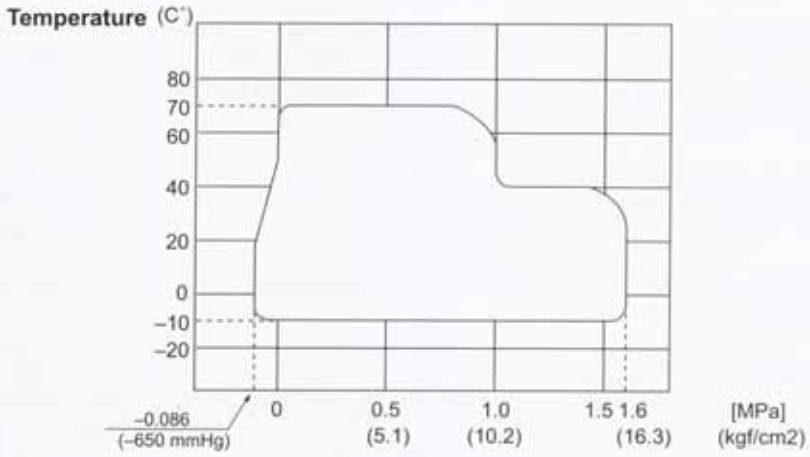
- The material of No. 1, 2, 6 is changeable to SUS304.
- It is producible for oil application by changing the rubber material. Please consult us.
- Please use U-FLEX for hot water supply.

## • 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




**Maximum Working Pressure**

## • Notes

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

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

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

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

Specifications are subject to change without prior notice

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# TOZENFLEX

## FLEXIBLE RUBBER JOINT

## Features

- **APPLICABLE TO BOTH SUCTION AND DELIVERY (DISCHARGE) WITH ITS EXCELLENT STABILITY AND PRESSURE RESISTANCE**
  With the combination of excellent moulding technique and tough chemical fiber, TOZENFLEX can be used at a bursting pressure of over 780psi (55kgf/cm$^2$) and within max. internal pressure of 240psi (16kgf/cm$^2$). In addition, since it can satisfactorily withstand the force of creating a vacuum of 650mmHg for 32A-300A and 375mmHg for 350A and 400A, it can be used on both delivery and suction sides. Also since its caracass is of a special spherical type, it will not come in contact with the connecting bolt heads even if it expand. This connector can be used with a sense of security even when subjected to high pressure.

- **EXCELLENT TEMPERATURE RESISTANCE**
  Since this connector is made of heat resisting Synthetic rubber of special composition, which is superior to natural or chloroprene rubber, its deterioration due to hot water is quite limited and its exhibits a stable pressure withstandability persistently.

- **EXCELLENT ABILITY TO ISOLATE SOUND AND VIBRATION**
  The highly soft caracass effectively isolates vibration and solid sound in all directions.

- **OTHER ADVANTAGES AND EFFECTS**
  1) Needs neither gasket nor packing.
  2) Since flanges used are of loose fit type, they can be installed in pipes easily.
  3) Its ability to absorb elongation and compression of pipes caused by variation in temperature prevents the piping system and equipment from breading down.
  4) It absorbs the pulsation of water and prevents water hammering to some extent.

## Typical Applications

This joint is applied to the piping system for construction equipment and industrial plants where noise and vibration isolation as well as alignment between pipes are required.

**Examples :**

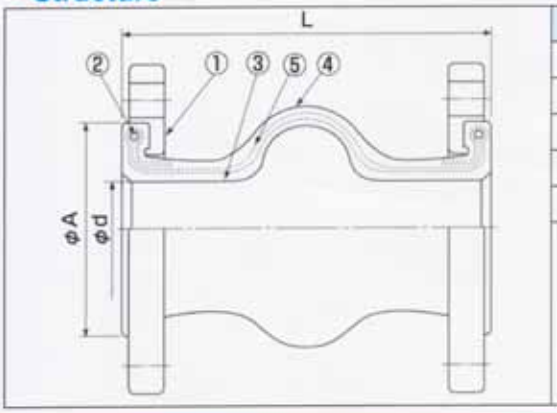
1) Air-conditioning and sanitary equipment
2) Industrial plant equipment
3) Marine piping systems : Feed-water and drainage equipment, etc.
4) Various plant piping systems : power generation plants, chemical plants, etc.

**** Please note that TOZENFLEX is not applicable to oils, circulation pumps for pool water, air, gases nor hot water supply line. ****

## Applicable Fluid

- Applicable Fluid : water, hot water, sea water, weak acid, weak alkaline, etc.
- Please apply within the operating conditions in pressure and temperature.

## • Structure




| No. | Parts | Materials |
|---|---|---|
| ① | Flange | SS400, FCD |
| ② | Reinforcing Ring | SWRH |
| ③ | Inner Rubber | Synthetic Rubber |
| ④ | Outer Rubber | Synthetic Rubber |
| ⑤ | Reinforcing Cord | Synthetic Fiber |

- Flanges on ANSI, JIS, PN, and Screwed Ends Type are available. Please consult us.
- Synthetic Rubber is EPDM which is the standard material. (Other kinds of rubber material are optional.)
- The products are not applicable to oil. However, it may be possible by changing the rubber material. Please consult us.

## · Dimension and Allowable Movement

| Nominal Dia. | Dimension (mm) | | | Allowable Movement (mm) | | | | Installation Tolerance (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) | L | ØA | Ød | T.M. | A.E. | A.C. | A.M.(° ) | T.M. | A.E. | A.C. | A.M.(° ) |
| 32 | 150 | 80 | 40 | 20 | 10 | 20 | 25 | 8 | 3 | 6 | 10 |
| 40 | 150 | 80 | 40 | 20 | 10 | 20 | 25 | 8 | 3 | 6 | 10 |
| 50 | 150 | 96 | 50 | 20 | 10 | 20 | 25 | 8 | 3 | 6 | 10 |
| 65 | 150 | 115 | 65 | 20 | 10 | 20 | 20 | 8 | 3 | 6 | 10 |
| 80 | 150 | 125 | 75 | 20 | 10 | 20 | 20 | 8 | 3 | 6 | 10 |
| 100 | 150 | 152 | 100 | 20 | 15 | 20 | 20 | 8 | 3 | 6 | 10 |
| 125 | 150 | 182 | 125 | 20 | 15 | 20 | 20 | 8 | 3 | 6 | 10 |
| 150 | 150 | 212 | 150 | 20 | 8 | 15 | 20 | 8 | 3 | 6 | 10 |
| 200 | 150 | 263 | 200 | 20 | 8 | 15 | 20 | 10 | 3 | 6 | 10 |
| 250 | 200 | 322 | 250 | 25 | 15 | 20 | 20 | 10 | 3 | 6 | 10 |
| 300 | 200 | 370 | 300 | 25 | 15 | 20 | 20 | 10 | 3 | 6 | 10 |
| 350 | 200 | 417 | 350 | 25 | 15 | 20 | 20 | 10 | 3 | 6 | 10 |
| 400 | 200 | 478 | 400 | 25 | 15 | 20 | 20 | 10 | 3 | 6 | 10 |

T.M. = Transverse Movement
A.E. = Axial Elongation
A.C. = Axial Compression
A.M. = Angular Movement
** Although allowable movements are given, do not allow them for axial elongation when installing the joints for suction purpose. **

- Use the products within the given allowable movements.
- Tolerances for installation 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.

## · 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 transverse movement is anticipated more than the designed movement.
- In case that the connectors are anticipated to be compressed when installation.

## · Notes

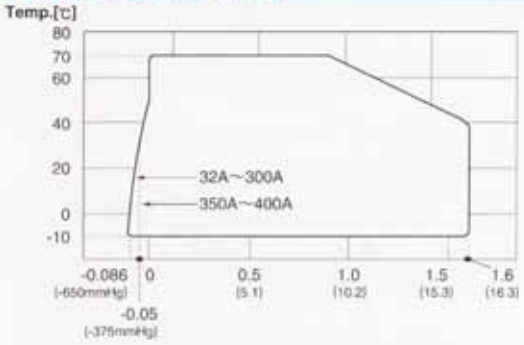
1. Information in the above table is for single displacement only. In case of complex displacement, follow the below expression.

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

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.

## · Operating Condition




Max.Working Pressure [MPa](kgf/cm²)

## · Example of Installation

Specifications are subject to change without prior notice.

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