

# Flexible rubber joint

Thank you very much for purchasing our flexible rubber joints.  
Before using these products, please read this instruction manual carefully to ensure safety.

After the joints have been installed, this instruction manual should be given to the personnel responsible for checking and maintenance. If you have any questions about our products, please contact our nearest office.

◆ It should be noted that the information in this instruction manual is subject to change without notice.

## 1. Prohibitions

Note that the products cannot be used for the following applications. It should be noted that if the products experience abnormalities and lead to any accidents because any of the following items have not been observed, our company shall not be responsible.

### 1) Be careful about oil use

The products cannot be used for oil.

### 2) Use for hot-water lines prohibited

The products cannot be used for hot-water lines.  
For this purpose, use our PTFE flexible joints.

### 3) Use for pool water prohibited

The products cannot be used around pool water circulating pumps. Use our PTFE flexible joints. Consult us regarding other pool water and hot spring water lines.

### 4) Use for intensified pressure water supply and pressurized water supply units prohibited.

## 2. Use precautions

1) Prior to use, check the product for any flaws. If any damage is found on the packing surface or outer surface within the rubber body, the product should not be used.

### 2) Use range

Before using, check that the maximum working pressure and maximum working temperature at the site are within the working ranges of each product. Use outside the working ranges will shorten the product life, resulting in such trouble as fluid leakage.

### 3) Correction of composite displacement

The allowable displacement of each product indicates the maximum single displacement value. Cases of composite displacement should be corrected using the following formula.

$$\text{Corrected elongation} = \text{Allowable elongation} \times \left\{ 1 - \left( \frac{\text{Eccentricity}}{\text{Allowable eccentricity}} + \frac{\text{Angle of deviation}}{\text{Allowable angle of deviation}} \right) \right\}$$

(Example) Corrected allowable elongation when eccentricity of 10 mm is required with TWINFLEX 100A

$$\text{Corrected elongation} = 15 \times \left\{ 1 - \left( \frac{10}{25} + \frac{0}{30} \right) \right\} = 9.0\text{mm}$$

4) Since the product may be damaged due to a malfunction such as a no-discharge operation, be sure to check valve opening/closing when operating.

5) Avoid valve operations in which fluid flows rapidly.

6) We recommend that the product be used at an internal flow rate not higher than 3 m/s.

7) Take care so that oil/grease, organic solvent (thinner, toluene, etc.), acid, alkali, etc. will not stick. In case of sticking, immediately wipe it off.

8) If air is used for pressure testing of the piping line, remove the joint beforehand. For testing with the joint installed, use liquid pressurizing instead of air pressurizing.

9) For use range and allowable displacement of products, refer to our general product catalog.

10) Pumping up water from water tank to the pump which located on higher place or always occurs negative pressure water line, failure may happen. Proposed to use PT-LSconnector (For Negative Pressure) for above water line.

## 3. Storage precautions

1) Due care must be taken not to damage the product during transportation and storage. Do not use the product if it is damaged.

2) For long-term storage, store the product in a cool dark and avoid exposure to direct sunlight.

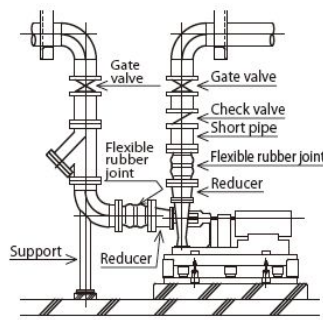
3) Do not leave the product at temperature of 40°C or higher, in high humidity, or in a moist place for a long time.

4) Be careful not to expose the product to fire.

5) Be careful not to impose loads on the product.

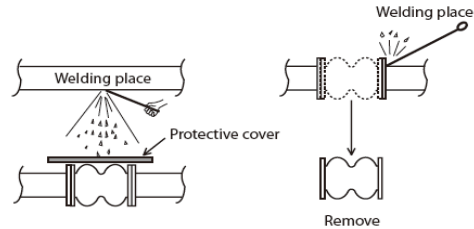
## 4. Working precautions

1) For positioning of the product for installation to a pump, see the illustration on the right. accumulate due to the water head, it is possible that fatigue could the upstream side of the product, If a check valve is installed on and water hammer could be caused due to starting and stopping of the pump, resulting in trouble. If a gate valve (butterfly valve) is piped directly to the product, the packing surface may be damaged. We recommend installing it via a short pipe.



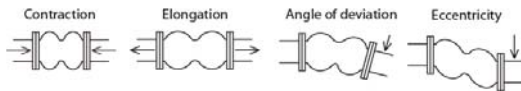
5) When the flexible rubber joint is connected to the piping, due attention should be paid to the dimensions and accurate centering so that unnecessary external force (compression, tension, twisting, etc.) will not be imposed.

6) When welding or fusing is performed near the product after in stallation, the product should be covered with protection against sparking. the product should be removed. If it is possible that welding/ fusing heat could be conveyed,

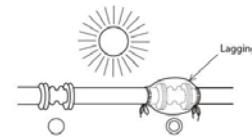


2) The product's internal pressure causes reaction force and changes the dimension. Please kindly contact us for the product performance data to considering piping support, vibration isolation support.

3) The product should be installed within the dimensional tolerances of elongation, contraction, eccentricity, and angle of deviation.



7) Discoloring of the outer rubber due to outdoor piping will not cause any problems regarding quality or performance, but if protection is desired, we recommend installation of lagging.



4) Install the product properly to avoid touching the surrounding structures and equipment (especially sharp corners) in case the product has displacement.

8) The flange is loose type, if the mounting bolt holes are misaligned, please align the bolt holes before installing the joint.

## 5. Connection precautions

### Flange connecting

1) Regarding the flexible rubber joint, the packing seal face of the rubber body may be damaged due to the shape of the counterpart flange. Check the flange shape with reference to the following table.

### Flange type ( Type of gasket )

Flat Face type flange	Raised face type flange	Groove type flange	Tongue type flange Male & Female type flange
<p><b>No problem</b></p> <p>There is enough pressure to hold the packing area of the rubber body. However, welding may damage the packing surface. Removed the debris with a file or sandpaper, use a non rubber gasket (such as sheet packing) together if necessary.</p>	<p><b>No problem</b></p> <p>The diameter of the packing surface of the rubber body and the counter flange's bearing surface are the same, there is sufficient force to hold the packing part. However, if a coating such as polyvinyl chloride lining is applied, due to counter flange's coating different may occur gaps. This may damage the packing surface, use non rubber gasket (such as sheet packing) if necessary.</p>	<p><b>Conditional</b></p> <p>Use a non rubber gasket ( such as sheet packing ) between the packing surface of the rubber body and the counter flange. When directly use GF type gasket to GF type flange, there is a double packing with same material, the sealing performance may drop.</p>	<p><b>It can not be used</b></p> <p>The contact area between the protrusion and the packing surface of the rubber body is small, and the unit load is large, the packing surface may damaged.</p>

2) The mounting bolts should be inserted from the product side and the nuts should be tightened on the counterpart side. We recommend spring washers to prevent loosening.

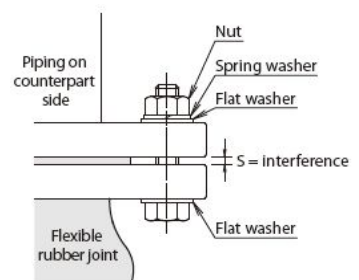
If insertion from the product side is impossible, insert the continuous thread studs and bolts from the piping side. Be careful so that the bolt end will not protrude excessively on the product side.

3) When installing, make sure that the recessed part (groove part) of the flexible flange and the packing part of the rubber body are properly set.

4) The mounting bolts should be uniformly tightened diagonally.

For the amount of tightening of each product, see the next table.

If the counterpart side is lap piping or lining pipe, the interference The seat thickness should be considered. Abnormal installation, such as uneven tightening, will damage the product and cause tightening trouble.



5) After installation and operation, the mounting bolts may loosen as a result of pump vibration. Uniformly retighten them diagonally.

## 5.Connection precautions

6) Please refer to the table below for the gap interference of each product.

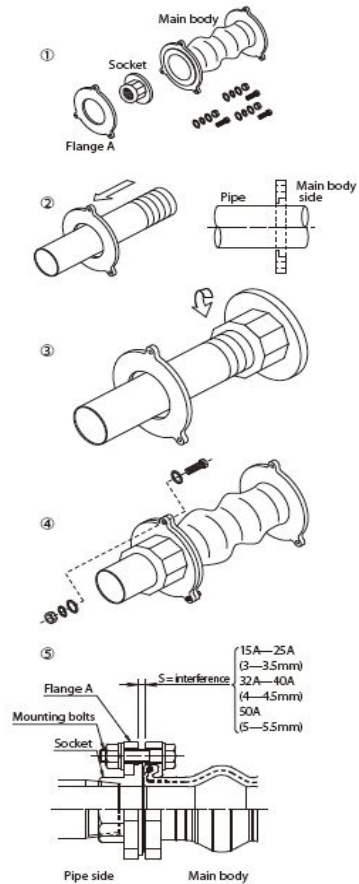
Nominal diameter	Sinterference(mm)		Nominal diameter	Sinterference(mm)	
	●TWINFLEX			●TWINFLEX25	
	●10-FLEX				
	●OFLEX				
	●OFLEX-H				
●TOZENFLEX					
20A~25A	1	32A~300A	1~2		
32A~150A	1~2				
200A~600A	2~3				

※When counterpart flange is FF

### In case of screw-in connection

Working procedures for TWINFLEX S and TOZENFLEX S and connection precautions are given below.

- 1) Remove the mounting bolts and disassemble flange A and socket from the main body.
- 2) Put flange A through the counterpart piping, checking the direction of the flange.
- 3) Check that the pipe thread on the piping side is smooth and undamaged.
- 4) Wrap the seal tape (or sealant) around the pipe thread on the piping side and manually tighten the socket to the possible number of threads, and sufficiently tighten it with a spanner (or wrench) applied on the flat diameter of the socket and a wrench applied on the pipe on the piping side.
- 5) Install in accordance with the procedure in Figure 4.
- 6) The mounting bolts should be uniformly tightened avoiding uneven tightening and regarding the extent of tightening, refer to the interference in Figure 5.
- 7) For the opposite side as well, work in accordance with procedures (2) to (6).
- 8) After installation and operation, the mounting bolts may loosen as a result of pump vibration. In such a case, drain and then uniformly retighten them.



## 6.Manufacturing year/month indication

The manufacturing year/month is indicated on the rubber portion of the main body as shown in the illustration on the right.  
In case of manufacturing in September 2021



## 7.Useful life

The flexible rubber joint is a composite elastic body composed of rubber and a reinforcing layer. It has a useful life and cannot be used indefinitely. Since the life of the product greatly depends on various factors, it is not possible to define its useful life. Please see the TOZEN website for details.

## 8.Checking and maintenance

The useful life of the flexible rubber joint varies depending on use conditions. After the elapse of the useful life, troubles such as leakage will occur. You are requested to conduct checking and maintenance for early discovery of product troubles and abnormal equipment conditions.

### 1) Types of checking and implementation timing

- a. Checking at completion ----- At completion ----- Check that the working conditions are observed and the completion has been achieved.
- b. Normal checking ----- Twice or more per year ----- Check the products, working conditions, and installation conditions to promote early discovery of abnormalities and prevent accidents.
- c. Periodical checking ---- Every 5 years after completion ---- Check for any abnormalities in greater detail than in the case of normal checking.
- d. Special checking ----- Just after a disaster ----- Just after a disaster such as a large earthquake, fire, or looding, immediately check for any effects on the products. Conduct sampling if necessary.

### 2) Check items

Check type	Check portion	Check item	Check method
a. Checking at completion b. Normal checking c. Periodical checking d. Special checking	Joint portion	1. Loosening of bolts/nuts 2. Leakage from packing portion	By touch By touch/Visual
	Outer surface of main body	1. Flaw/cracking on outer rubber	Visual
		2. Partial abnormal swelling	By touch/Visual
		3. Contact of outer rubber with bolt/nut head or trace of biting	Visual
		4. Displacement exceeding the allowable value of the product (a, c, and d only)	By measurement

### 3) Troubleshooting

If any abnormality is recognized as a result of any check, undertake remedial measures with reference to the following table.

Relevant portion	Abnormality	Cause	Measure	Remedy
Joint portion	Leakage from packing face	1) Allowable displacement is exceeded.	1) Correct the piping.	If the leakage does not stop, replace. If the flange packing face shows an abnormality, replace.
		2) Allowable pressure is exceeded.	2) Lower the pressure to the allowable pressure or lower.	
		3) Abnormal pressure fluctuation	3) Reduce the pressure fluctuation.	
		4) Fixing fault/damage	4) Correct the fixing.	
		5) Looseness of bolt and nut	5) Retighten after draining	
Outer surface of main body	Leakage from main body	Damaged		Replace
	Outer rubber is flawed or cracked.	External factor	If it has not reached the reinforcing layer, observe the progress.	If it has reached the reinforcing layer, replace.
	Partial abnormal swelling	Invasion of fluid between outer rubber and reinforcing layer.		Replace
	Abnormal deformation occurred during operation, and the bolt/nut head is in contact with the outer rubber or a trace of biting is recognized.	1) Allowable displacement is exceeded. 2) Occurrence of abnormal pressure.	1) Correct the piping. 2) Lower the pressure to the allowable pressure or lower.	In case of abnormal deformation, replace.
Inner surface of main body	Inner rubber is flawed or cracked.	Erosion due to fluid		Replace
	Abnormal friction caused to the inner rubber.			
	Local swelling is recognized on the inner rubber.	The rubber has become swollen.		