

## Rubber selection guide

○:Are suitable △:By conditions ×:Cannot be used

Required performance \ Rubber type	EPDM Ethylene propylene rubber	CR Chloroprene rubber (neoprene)	NBR Nitrile-butadiene rubber	NR natural rubber
Heat resistance	○	○	△	△
Cold resistance	○	△	△	○
Solvent resistance	×	×	△	×
Oil resistance	×	○	◎	×
Acid resistance	○	○	×	○
Alkaline resistance	◎	◎	△	○
Weather esistance	◎	○	△	△
Abrasion resistance	△	△	○	◎

■ This chart is a guideline for selecting materials. Please contact us for detail.

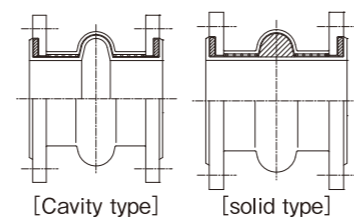
### Arch structure

This refers to the internal structure of the arch part of expansion joints and flexible tubes. [Cavity type] with the internal void structure and [solid type] that is filled with soft rubber are available. [Cavity type] is the standard.

[Solid type] is used when fluid contains solids, such as sludge.

※ Please take precautions that the deflection decreases for arches in solid types.

This refers to the bolt used for controlling face-to-face dimension that is attached to expansion joints or flexible tubes.



## Control unit

Two types of bolts, including [set bolt] and [tie rod bolt] are available for different purposes.

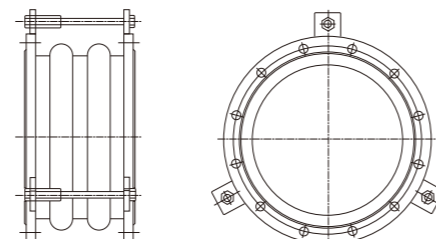
※ Roval paint is used for the stay of the set bolt and tie rod bolt even when a flange with hot-dip galvanization is used.

### Set bolt

This is used for adjusting the face-to-face dimension when installing a joint. Please remove it after installation.

The set bolt is used to shorten the face-to-face dimension to make the installation of rubber joints to pipes easier.

Be sure to remove it after installation. The quantity of the set bolt varies depending on the diameter.



### Tie-rod bolt

This is used to regulate the force in the axial direction that is generated by the internal pressure and to prevent excessive displacement. The adaptor type (standard) and stay type (individual order) are available.

① The rubber joint with arch structure generates the force (approximately cross-sectional area times the internal pressure) in the axial direction when pressure is being applied, and the face-to-face dimension increases. Force may be applied to pipes and surrounding devices in such cases. Thus, please provide a thorough support for the pipe or use a tie rod bolt.

② In addition, a rubber joint may be destroyed when excessive deflection is applied. Thus, please use a tie rod bolt in such cases as well.

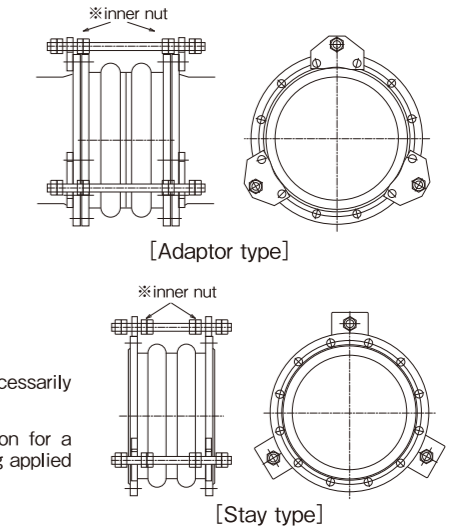
③ Please properly set the position of securing the nut of the tie rod bolt for the deflection (compression, extension, and eccentricity).

④ Adaptor type requires a longer bolt at the adaptor installation part. Please make sure that a proper bolt is provided during preparation.

⑤ Tie rod bolts are designed to suit actual operating pressure; thus, they may not necessarily match with the highest operating pressure described on the body of a rubber joint.

⑥ Please take precaution that the nut of a tie rod bolt is secured at a proper position for a deflection, and it may extend to the dimension of the deflection when pressure is being applied and apply pressure on pipes.  
※The nut shown in the diagram is an optional part.

No of tie-rod bolt varies on NB and pressure.



## Note for Operation Flexible Joint, Flexible Tube, Expansion Joint

In order to use own products properly, please read the following manual carefully before installation.

### Note of use

① Check existence of damage on the body before use.

Do not use the Joints if any damage is found out on the packing face, inner and outer rubber or Teflon.

② About the range of use

Use the Joints within allowable operating range in respects of maximum pressure and temperature.

In case you use the Joints out of the range, it will cause extraordinary short of usable life, liquid leakage, etc.

③ Correction of deflection

Allowable deflection on catalog shows individual maximum figure.

In case of compound deflection, please correct the figure by following formula ;

$$X = X' \times \frac{Y' - Y}{Y'} \times \frac{\theta' - \theta}{\theta'}$$

X: Correction axial movement  
X': Allowable axial movement  
Y: Actual lateral deflection  
Y': Allowable lateral deflection  
θ: Actual angular deflection  
θ': Allowable angular deflection

④ Before operating, please make sure the valve is open to avoid burst or damage of the Joint.

⑤ Do not operate(open) the valve suddenly/wildly, to avoid fluid rush.

⑥ We recommend you to use the Joint with fluid speed not faster than 3m/sec.

⑦ Do not apply the Joint where pressure changes frequently, such as at delivery side of the pressurizing pump, etc.

When the flange material is a vinyl chloride		
Size	Maximum operating pressure	Maximum operating temperature
20A~100A	0.5 MPa	55°C
125A~150A	0.25MPa	
200A~300A	0.2 MPa	

### Note of storage

① Pay attention not to damage the Joints during transportation and storage. If damaged, do not use them.

② For a long time storage, avoid direct sunshine and store the Joints at cool and dark place.

③ Do not leave the Joints for a long time at the place where temperature is 40°C or more, or excessively moist place.

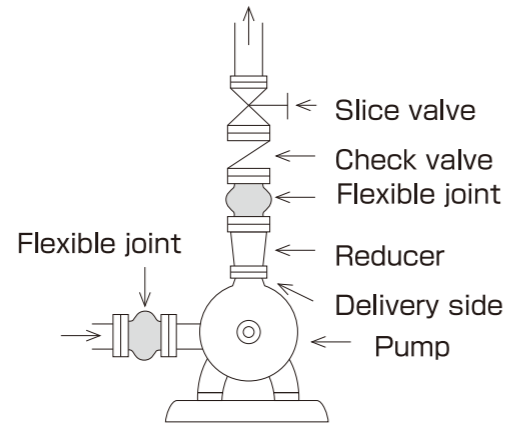
④ Pay attention to keep off the Joints from fire.

⑤ Do not put load on the Joints.

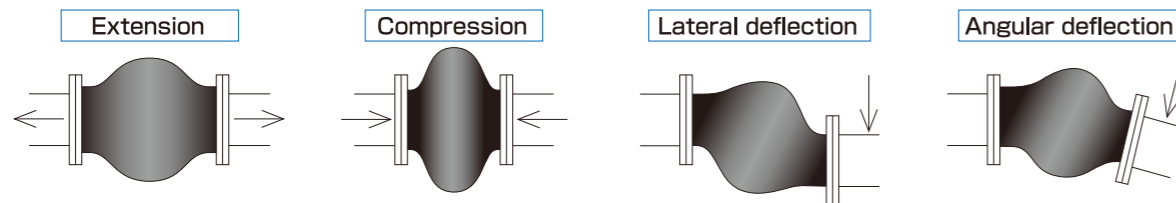
⑥ Do not store the Joints at the place where organic solvents or oil might adhere.

## Note of installation

- As to positioning of Pump, Joint, and other parts, please refer to the sketch.  
If Check valve is mistakenly installed between Pump and Joint, the Joint will be damaged by reverse flow pressure.  
Install proper Pressure gauges on inlet side pipe before the Joint, and on outlet side pipe between the Joint and Check valve.  
And always check loading pressure and its alteration.



- Please install the Joint to the pipe in the allowance of the Extension, Compression, Lateral deflection and Angular deflection.



- Estimating considerable transformation and deflection of the Joint, install it keeping enough distance from surrounding equipments especially sharp corners.
- When fixing the Joint to pipe, get accurate dimension, positioning and alignment, in order to avoid unnecessary pressure such as compression, extension, bending, or distortion.
- After installation, when you operate welding work near the Joint, put nonflammable protective cover on the Joint. In case welding heat might transfer to the Joint, remove it from the installation.
- When using it outdoors, protect from Ultra-violet rays.
- In case the fluid temperature is 60°C or higher, do not put Joint cover.
- Do not paint on the Joint.
- When fixing the Joint to Pipe, use hexagonal bolts. Insert the bolt from Joint Body side and fasten the nut with spring washer. Fasten all the bolts evenly.
- The Joint will have reaction force due to inner pressure when operating. Fix the pipes firmly especially near both ends of the Joint, so that the Joint can work in full performance.
- If the pipes cannot be fixed firm enough, you can apply tie-rod. In this case, allowable deflections might be reduced depending on sizes



- Please use FF flange to the other piping side as much as possible to avoid damaging the seal face. When you use RF flange unavoidably, please apply a hard gasket like the joint-seat.

## Usable life

Life of the Joint varies by many factors, and cannot be specified exactly.

We set up the Standard Usable Life as follows under normal and average operation:

- Standard Usable Life : about 3 to 10 years
- Operation condition :
  - Max. working temperature . . . Normal temperature (0~40°C)
  - Max. working pressure . . . 0.98 MPa (10kgf/cm<sup>2</sup>)
  - Stop/start frequency . . . 10~20 times/day
  - Operating hours . . . Less than 10 hours/day
  - Installation . . . Properly aligned and reasonable pipe installation with proper firm support.

Standard Usable Life will vary very much depending on installation, deflection load, operating hours, etc.

Therefore please consider it as rough reference.

Further, we would like to ask you to execute inspection and maintenance, in order to judge the life properly and to avoid any accident.

## Factors to shorten the life

Please note that the life will be shortened by the following cases.

- When operated for a long time at high pressure near max. working pressure.
- When operated for a long time at high temperature near max. working temperature.
- When operated for more than 10 hours a day.
- When operated with big pressure variation.
- In case of outdoors use, when operated for a long time without putting cover.
- When operated at max. allowable angle deflection.

## Inspection for maintenance

Usable life of the Joint differs depending on operation condition.

After the usable life, some improper condition like leakage may happen.

In order to find out abnormal condition in early stage, we would like to ask you to execute inspection and maintenance.

(1)Kinds and time of inspection

- Completion inspection -----When completed.  
Check and record that it is properly installed under reasonable operating condition.
- Usual inspection-----Not less than twice a year.  
To find out abnormality earlier and avoid any accident, check the Joint, its operating condition, and installation.
- Terminal inspection  
5 years after completion, check to find any defects which were not found by normal inspection, and confirm endurance of the Joint.
- Emergency inspection  
In case of Earth quake, Fire, or Water flood, immediately inspect the Joint whether any abnormality occurred or not.  
Also execute same inspection when any abnormality is found out by Usual inspection.

Temperature, Pressure and Deflection will vary the length of Joint Life.

After the Usable life, some improper condition like leakage may happen.

You are strongly required to carry out the following matters :

- Usual inspection  
Check the Joint at least once in a half year and confirm whether there is any abnormality.
- Basis of Replacement  
If the following abnormality is found out, stop operation and replace the Joint immediately.
  - Fluid leakage
  - Damage/Flaw on Joint
  - Deformation on Joint
  - Remarkable corrosion on whole round of Flange
  - Movement exceeding allowable deflection of the Joint during operation

## Guarantee

**Guarantee period of this Joint is one year after delivery.**

Please note that the following cases are out of guarantee :

- Accident and damage caused by incorrect installation, incorrect operation, repair, and reconstruction.
- Accident and damage caused by natural disaster such as Fire or Earthquake.
- Accident and damage caused by transportation after purchase or improper storage.