

**SUNNYSTEEL**

## Rubber Expansion Joint

Enhancing Piping Flexibility and Performance



## ■ What is a rubber expansion joint?

A rubber expansion joint is a vital component in piping and equipment systems designed to address various challenges like vibration, shock, noise, and the natural expansion and contraction that occurs due to temperature fluctuations.

These joints are made from rubber or elastomeric materials that provide flexibility and absorb movement, preventing damage to pipes and equipment while ensuring a smoother and quieter operation. Rubber expansion joints also help mitigate the stresses caused by thermal expansion and contraction, which can lead to leaks, cracks, or premature wear and tear. By absorbing these movements, they contribute to extending the service life of the entire system and maintaining its efficiency.

### 🌀 Benefits of Rubber Expansion Joints:

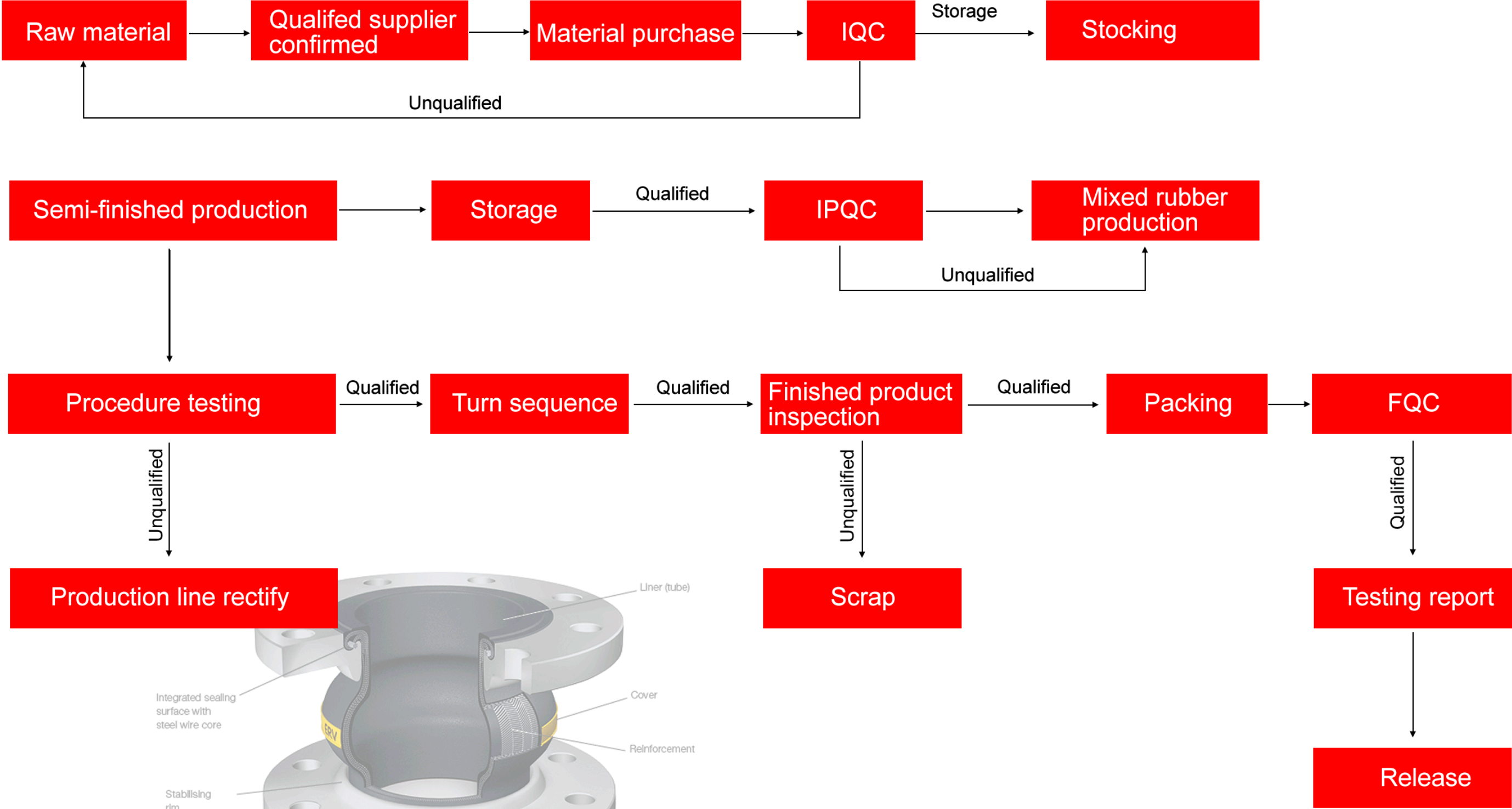
- **Flexibility:** They provide a high level of flexibility in various directions (axial, lateral, and angular), making them suitable for dynamic applications.
- **Durability:** High-quality rubber compounds ensure long service life, even in harsh conditions.
- **Ease of Installation:** Lightweight and easy to install compared to metal expansion joints.
- **Corrosion Resistance:** Rubber is resistant to many corrosive chemicals, making it suitable for harsh environments.

Rubber expansion joints are essential components in modern piping systems, providing flexibility, protection, and reliability. By absorbing movements, isolating vibrations, and accommodating misalignments, they play a crucial role in maintaining the integrity and longevity of piping systems across various industries.



# Production Management

Advanced production equipment + scientific management = reliable products





## 🔧 Rubber Performance Form:

		caoutchouc	styrene butadiene rubber	neoprene	butyronitrile rubber	butyl rubber	Ethylene Propylene lepolymer	silicone rubber	fluoro rubber	hypalon	chlorosulfonated Polyethylene
cross--linked rubber mechanical performance	hardness	10-100	30-100	10-90	15-100	20-90	30-90	30-90	50-90	50-90	50-85
	tensile strenght kg/cm <sup>2</sup>	30-300	50-200	50-250	50-250	50-150	50-200	40-100	70-200	70-200	70-200
	tensile rate%	100-1000	100-800	100-1000	100-800	100-800	100-800	50-500	100-500	100-500	100-600
	avulsion strength	○	△	○	○	○	△	△-X	○	○	○
	flexibility resistance	○	○	○	○	○	○	○-X	○	○	○
	erosion resistance	○	○	○-○	○	○	○	△-X	○	○	○
cross--linked rubber physical performance	highest temperature°C	100	100	130	130	150	150	280	300	160	160
	brittleness temperature°C	-50~-70	-30~-60	-35~-55	-10~-20	-30~-55	-40~-60	-70~-120	-10~-50	-20~-60	—
	aging resistance	○	○	○	○	○	○	○	○	○	○
	ozone resistance	X	X	○	X	○	○	○	○	○	○
	aeration	○	△	○-△	○-X	○	○	○-△	○-△	○	○
medium resistance	gasoline	X	X	○	○	X	X	△-X	○	○	△
	benzene	X	X	X	△-X	X	X	△-X	○	△	△-X
	strong acid	△	△	○	○	○	○	△	○	△-X	○
	weak acid	○	○	○	○	○	○	○	○	○	○
	strong alkali	○	○	○	○	○	○	○	X	○	○
	weak alkali	○	○	○	○	○	○	○	△	○	○

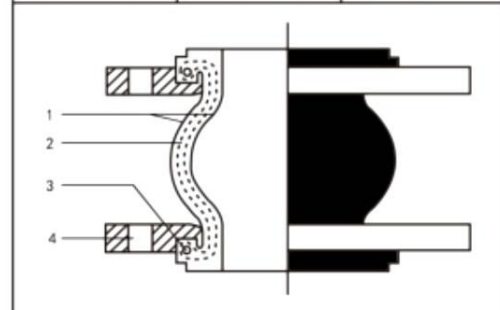
○—excellent ○—good △—can X—Not



## RUBBER EXPANSION JOINT SINGLE SPHERE REJ100

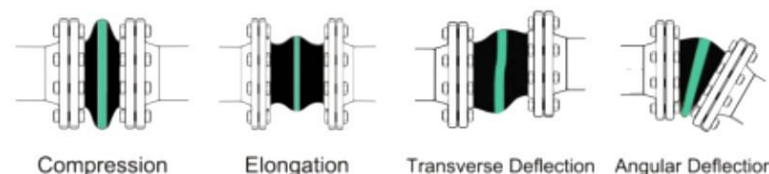


No	Name	Material
1	Outer/inner rubber	NR, EPDM, NBR, FKM, Neoprene etc.
2	Frame	Nylon cord fabric
3	Pressurized ring	Steel wire strand
4	Flange	Carbon steel galvanized, paint, ductile iron, stainless steel etc.



### Features

- Allow for four-way movements.
- Precision molded of synthetic rubber and nylon.
- Excellent ability to absorb vibration and noise.
- Withstand high pressure.
- Corrosion resistant.
- Easy to install, use floating flange.



### Main connection dimension

Nominal diameter mm	inc h	Length (mm)	Axial displacement		Horizontal movement (mm)	Deflection angle (α1=α2)°	Special length (mm)
			Compression (mm)	Extension (mm)			
32	1 1/4	95	9	6	9	15°	130/150/200
40	1 1/2	95	10	6	9	15°	130/150/200
50	2	105	10	7	10	15°	130/150/200
65	2 1/2	115	13	7	11	15°	130/150/200
80	3	135	15	8	12	15°	130/150/200
100	4	150	19	10	13	15°	130/200
125	5	165	19	12	13	15°	130/150/200
150	6	180	20	12	14	15°	130/150/200
200	8	210	25	16	22	15°	130/150/200
250	10	230	25	16	22	15°	130/150/200
300	12	245	25	16	22	15°	130/150/200
350	14	255	25	16	22	15°	130/150/200
400	16	255	25	16	22	15°	130/150/200
450	18	255	25	16	22	15°	200
500	20	255	25	16	22	15°	200
600	24	260	25	16	22	15°	300
700	28	260	25	16	22	15°	300
800	32	260	25	16	22	15°	300
900	36	260	25	16	22	15°	300
1000	40	260	26	18	24	15°	300
1200	48	260	26	18	24	15°	300

Sizes from DN25-DN3000 are all available, special sizes and lengths can also be customized, please contact us for exact data.

### Float Flange type



Carbon steel galvanized



Ductile iron



Stainless 304/316



Cast steel paint

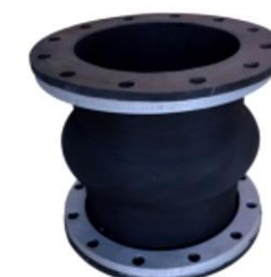
### Rubber joint body type



Molded body



With PTFE



Handmade body



PTFE liner

### Molded body



Welded



Non-welded



Plate type



Weld-neck type

### Handmade body

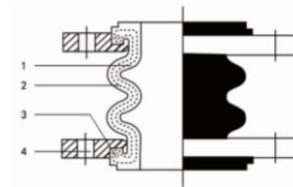
Operation Condition	Details
Working temperature	-15-80°C(-30~150°C)
Working pressure	6~40 bars (PN6~PN40)
Test pressure	1.5 times of working pressure
Explosion pressure	2 times of working pressure



# RUBBER EXPANSION JOINT DOUBLE SPHERE REJ200

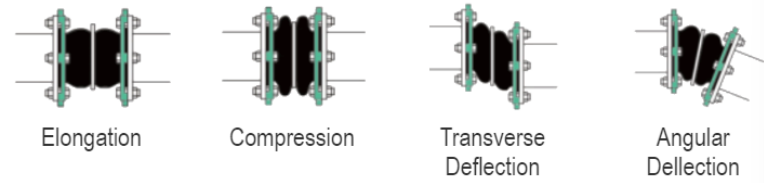


No.	Name	Material
1	Outer/inner rubber	NR, EPDM, NBR, FKM, Neoprene etc.
2	Frame	Nylon cord fabric
3	Pressurized ring	Steel wire strand ring
4	Flange	Carbon steel/ Stainless



## Features

- Allow for four-way movements.
- Precision molded of synthetic rubber and nylon.
- Excellent ability to absorb vibration and noise.
- Withstand high pressure.
- Corrosion resistant.
- Easy to install, use floating flange.



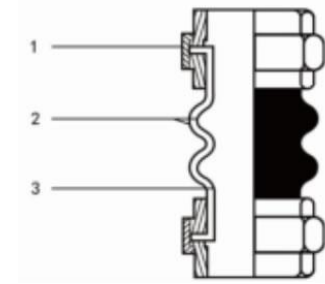
## Main connection dimension

N.D.		Length (mm)	Axial movement		Horizontal movement (mm)	Deflection angle (a-a)
mm	inch		Extension (mm)	Compression (mm)		
40	1	165	30	50	45	35
50	2	165	30	50	45	35
65	2.5	170	30	50	45	35
80	3	175	35	50	45	35
100	4	225	35	50	40	35
125	5	225	35	50	40	35
150	6	225	35	50	40	35
200	8	325	35	50	40	35
250	10	325	35	60	35	30
300	12	325	35	60	35	30
350	14	350	35	60	35	30
400	16	350	35	60	35	30
450	18	350	35	60	35	30
500	20	350	35	60	35	30
600	24	400	35	60	35	30

# RUBBER EXPANSION JOINT UNION THREADED REJ300

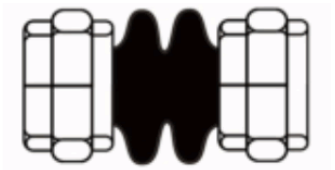


No.	Name	Material
1	Union	Malleable iron, ss304
2	Outer/inner	NR, EPDM, NBR, FKM, Neoprene etc.
3	Frame	Nylon and fabric

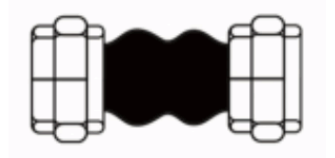


## Main connection dimension

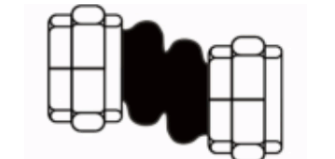
N.D.		Length (mm)	Axial movement		Horizontal movement (mm)
mm	inch		Extension (mm)	Compression (mm)	
15	1/2	200	22	5-6	22
20	3/4	200/220	22	5-6	22
25	1	200	22	5-6	22
32	1 1/4	200/220	22	5-6	22
40	1 1/2	200/220	22	5-6	22
50	2	200/220	22	5-6	22
65	2 1/2	240	22	5-6	22
80	3	280	22	5-6	22



Compression



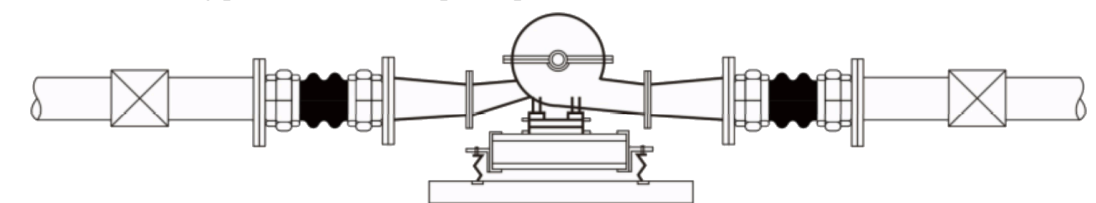
Elongation



Transverse Deflection

Higher temperatures affect movement and pressure. As temperature increases, rated values must be reduced accordingly.  
 Pressures shown are recommended "operating". Test pressure is 1.5 times "operating".  
 Sunny Steel Expansion joints may operate in pipelines or equipment's carrying fluids at evaluated temperatures and pressures. Normal precautions shall be taken to make sure these parts are installed correctly and inspected regularly. Precautions shall be taken to protect personnel in the event of leakage or splash.  
 For other kinds of applicable fluids, except the above to which the rubber joint becomes applicable, please kindly consult your supplier or manufacturer.  
 We offer you OEM and ODM service.

OEM and ODM service: Are supported by SunnySteel!  
 Packing: Usually, it is packed by carton case, then put into export plywood case.  
 Normal working pressure: PN16 (Special pressure can be customized)

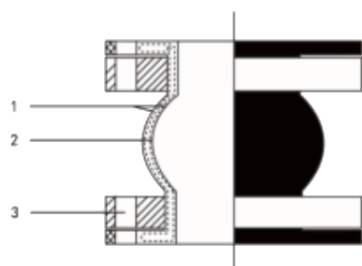


## RUBBER EXPANSION JOINT END FACE FULLY SEALED

REJ400

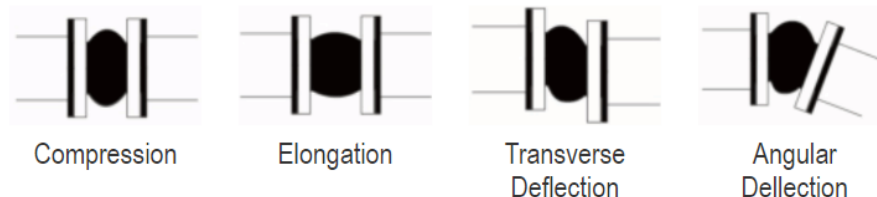


No.	Name	Material
1	Outer/inner rubber	NR, EPDM, NBR, FKM, Neoprene etc.
2	Frame	Nylon cord fabric
3	Flange	Carbon steel/ Stainless



### Features

- Allow for four-way movements.
- Precision molded of synthetic rubber and nylon.
- Excellent ability to absorb vibration and noise.
- Withstand high pressure.
- Corrosion resistant.
- Easy to install, use floating flange.



### Main connection dimension

N.D.		Length (mm)	Axial movement		Horizontal movement (mm)	Deflection angle (a-a)
mm	inch		Extension (mm)	Compression (mm)		
32	1 1/4	95	6	9	9	15°
40	1 1/2	95	6	10	9	15°
50	2	105	7	10	10	15°
65	2 1/2	115	7	13	11	15°
80	3	135	8	15	12	15°
100	4	150	10	19	13	15°
125	5	165	12	19	13	15°
150	6	180	12	20	14	15°
200	8	210	16	25	22	15°
250	10	230	16	25	22	15°
300	12	245	16	25	22	15°
350	14	255	16	25	22	15°
400	16	255	16	25	22	15°
450	18	255	16	25	22	15°
500	20	255	16	25	22	15°
600	24	260	16	25	22	15°
700	28	260	16	25	22	15°
800	32	260	16	25	22	15°
900	36	260	16	25	22	15°
1000	40	260	18	26	24	15°
1200	48	260	18	26	24	15°

For other kinds of applicable fluids, except the above to which the rubber joint becomes applicable, please kindly consult your supplier or manufacturer.

We offer you OEM and ODM service.

Higher temperatures affect movement and pressure. As temperature increases, rated values must be reduced accordingly.

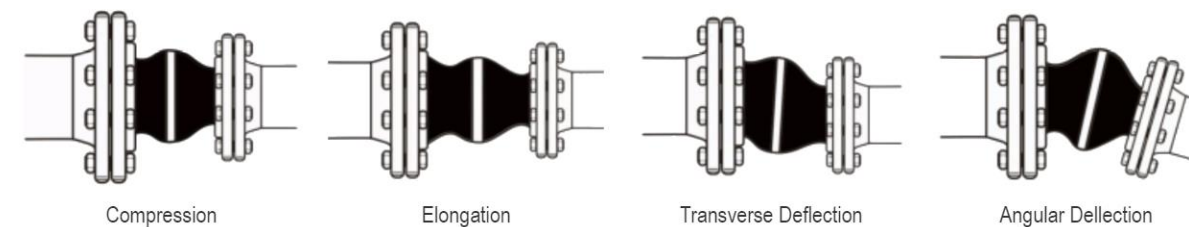
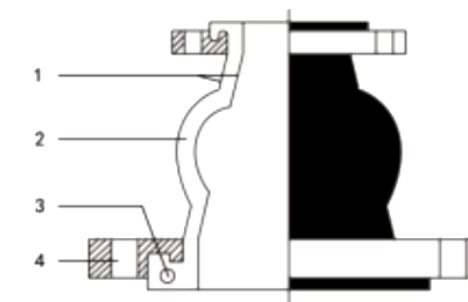
Pressures shown are recommended "operating". Test pressure is 1.5 times "operating".

Sunny Steel Expansion joints may operate in pipelines or equipment's carrying fluids at evaluated temperatures and pressures. Normal precautions shall be taken to make sure these parts are installed correctly and inspected regularly. Precautions shall be taken to protect personnel in the event



RUBBER EXPANSION  
JOINT CONCENTRIC  
REDUCING REJ500

No.	Name	Material
1	Outer/inner rubber	NR, EPDM, NBR, FKM, Neoprene etc.
2	Frame	Nylon cord fabric
3	Pressurized ring	Steel wire strand
4	Flange	Carbon steel/ Gal, Stainless



### Main connection dimension

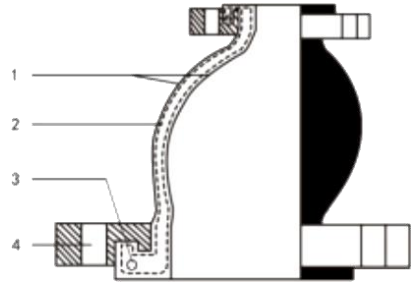
DN x DN	Length (mm)	Axial displacement		Horizontal movement (mm)	Deflection angle (a1 +a2)	DN x DN	Length (mm)	Axial displacement		Horizontal movement (mm)	Deflection angle (a1 +a2)
		Extension (mm)	Compression (mm)					Extension (mm)	Compression (mm)		
		(mm)	(mm)					(mm)	(mm)		
32x25	115	20	30	45	35°	125x100	200	22	30	40	35°
40x25	115	20	30	45	35°	150x50	200	22	30	40	35°
40x32	115	20	30	45	35°	150x125	200	25	35	40	30°
50x32	180	20	30	45	35°	200x80	200	25	35	40	30°
50x40	180	20	30	45	35°	200x150	200	25	35	40	30°
65x32	180	20	30	45	35°	250x100	220	25	35	40	30°
65x50	180	20	30	45	35°	300x250	220	25	35	40	30°
80x40	180	20	30	45	35°	350x300	240	25	35	35	30°
80x65	180	20	30	45	35°	400x350	240	25	38	35	30°
100x40	180	22	30	40	35°	500x300	240	28	38	35	26°
100x80	180	22	30	40	35°	500x400	240	28	38	35	26°
125x50	180	22	30	40	35°	600x400	240	28	38	35	26°

Special size and length can be customized production for you.

## RUBBER EXPANSION JOINT ECCENTRIC REDUCING REJ500-P



No.	Name	Material
1	Outer/inner rubber	NR, EPDM, NBR, FKM, Neoprene etc.
2	Frame	Nylon cord fabric
3	Pressurized ring	Steel wire strand
4	Flange	Carbon steel, 304, 316L



### Features

- Allow for four-way movements.
- Precision molded of synthetic rubber and nylon.
- Excellent ability to absorb vibration and noise.
- Withstand high pressure.
- Corrosion resistant.
- Easy to install, use floating flange.

### Main connection dimension

N.D.	Length (mm)	Technical parameters			Technical parameters		
		D	D0	n-φ	D	D0	n-φ
100×80	180	220	180	8-φ18	200	160	8-φ18
150×80	200	285	240	8-φ22	200	160	8-φ18
150×100	200	285	240	8-φ22	220	180	8-φ18
150×125	200	280	240	8-φ22	250	210	8-φ18
200×100	200	340	295	8-φ22	220	180	8-φ18
200×150	220	340	295	8-φ22	280	240	8-φ18
250×100	220	395	350	12-φ22	220	180	8-φ18
250×125	220	395	350	12-φ22	250	210	8-φ18
250×150	220	395	350	12-φ22	285	240	8-φ22
250×200	220	395	350	12-φ22	340	295	8-φ22
300×125	280	445	400	12-φ22	250	210	8-φ18
300×150	220	445	400	12-φ22	285	240	8-φ18
300×200	180	445	400	12-φ22	340	295	8-φ22
300×250	220	445	400	12-φ22	395	350	12-φ22
350×125	255	505	460	16-φ22	250	210	8-φ18
350×200	220	505	460	16-φ22	340	295	8-φ18
350×300	220	505	460	16-φ22	445	400	12-φ22
400×200	220	565	515	16-φ22	340	295	8-φ22
400×250	220	565	515	16-φ22	395	350	12-φ22
400×300	220	565	515	16-φ22	445	400	12-φ22
450×200	220	615	565	20-φ26	340	295	8-φ22
450×250	220	615	565	20-φ26	395	350	12-φ22
500×300	255	670	620	20-φ26	445	400	12-φ22

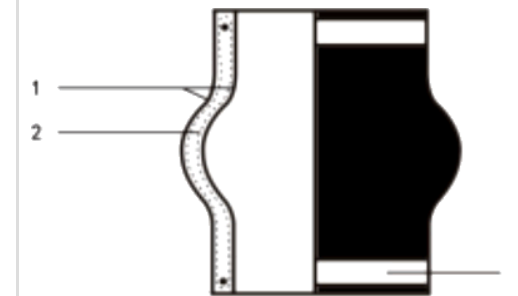
- Higher temperatures affect movement and pressure. As the temperature increases, rated values must be reduced accordingly.
- Pressures shown are recommended "operating"; the test pressure is 1.5 times the "operating" pressure.
- Our Expansion joints may operate in pipelines or equipment carrying fluids at evaluated temperatures and pressures. Normal precautions shall be taken to ensure these parts are installed correctly and inspected regularly. Precautions shall be taken to protect personnel in the event of leakage or splash.
- For other kinds of applicable fluids, except those above, to which the rubber joint becomes applicable, please kindly consult your supplier or manufacturer.

## RUBBER EXPANSION JOINT CLAMP TYPE REJ600

REJ600

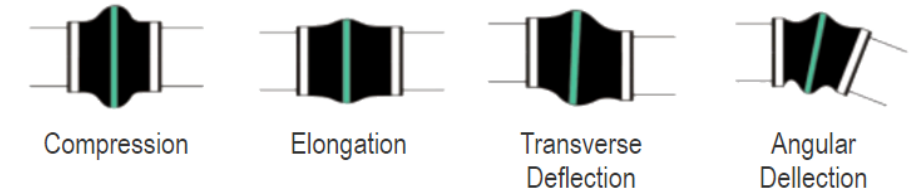


No.	Name	Material
1	Outer/inner rubber	NR, EPDM, NBR
2	Key frame	Nylon cord fabric
3	Clamp	Stainless 304



### Features

- Allows for four-way movements.
- Precision-molded of synthetic rubber and nylon.
- Excellent ability to absorb vibration and sound.
- With stands high pressure.
- Corrosion resistant.



### Main connection dimension

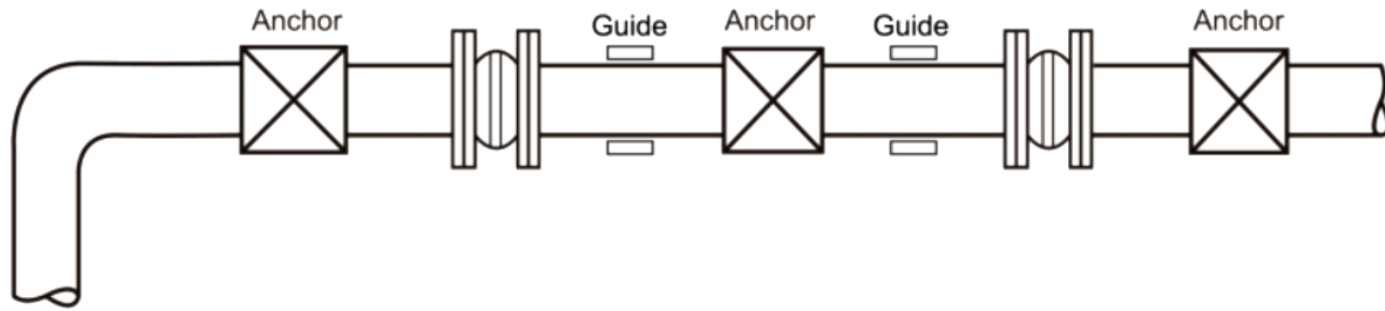
DN	O.D. of pipe (mm)	Length (mm)	Axial movement		Horizontal movement (mm)	Deflexion angle (a+ a₁)°
			Extension (mm)	Compression (mm)		
50	60.3	180	20	25	15	20
65	76	180	20	25	15	20
80	89	180	20	25	15	20
100	114	180	20	25	15	20
125	133	180	20	25	15	20
150	159	180	20	25	15	15
200	219	200	20	25	15	10
250	273	200	20	25	15	10
300	325	200	20	25	15	8
350	327	200	20	25	15	8
400	426	200	20	25	15	8
500	530	200	20	25	15	6
600	630	200	20	25	15	6

Special size and length can be customized for you.

- Higher temperatures affect movement and pressure. As temperature increases, rated values must be reduced accordingly.
- Pressures shown are recommended "operating"; test pressure is 1.5 times "operating".
- Sunny Steel Expansion joints may operate in pipelines or equipment's carrying fluids at evaluated temperatures and pressures. Normal precautions shall be taken to make sure these parts are installed correctly and inspected regularly. Precautions shall be taken to protect personnel in the event of leakage or splash.
- For other kinds of applicable fluids, except the above to which the rubber joint becomes applicable, please kindly consult your supplier or manufacturer.

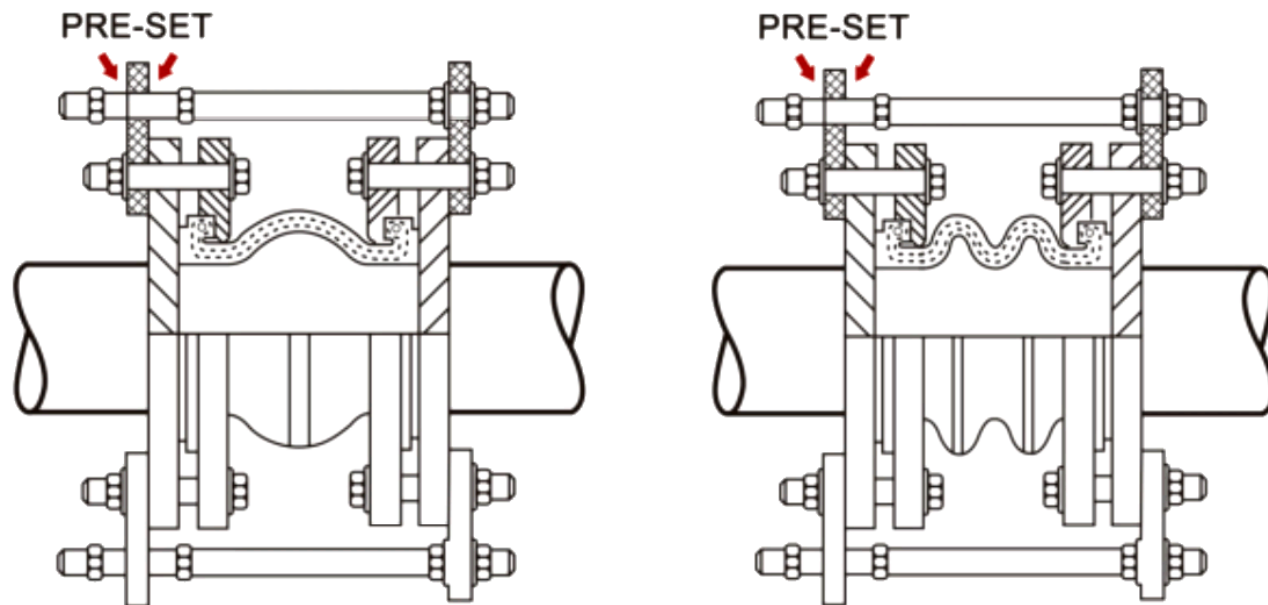


**INSTALLATION CAUTIONS 1**



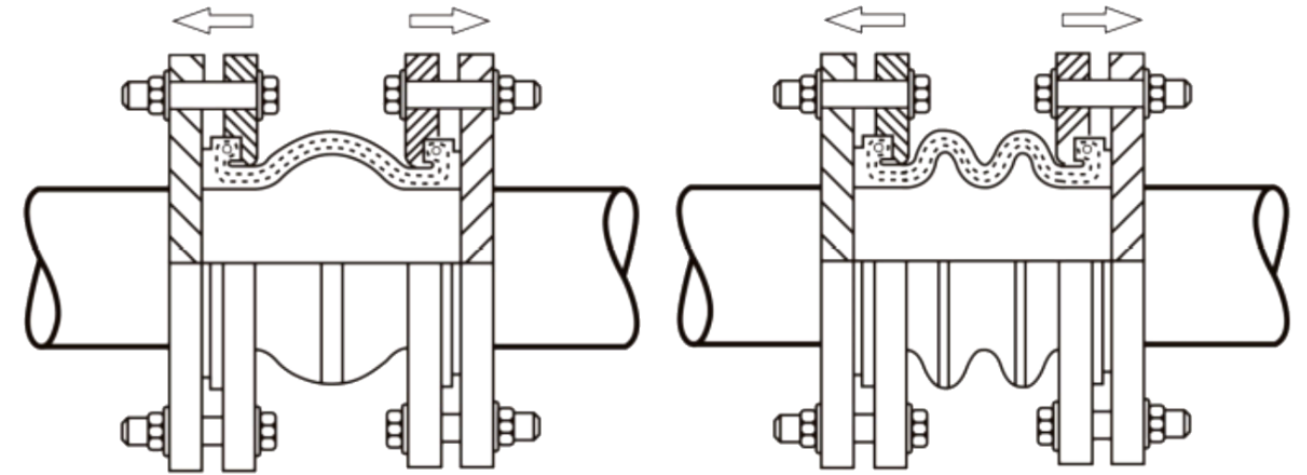
- Sunny Steel rubber expansion joints will extend in length when under pressure condition unless adequately restrained by anchors and guides, to ensure the pipe line is free from sag or pressure deflection.
- These pressures thrust forces can be very substantial at pressure above 2 bar. Do not use the expansion joint as a pipe support. Control rod assemblies are strictly required when the movement/pressure exceeds the permissible.

**INSTALLATION CAUTIONS 2**

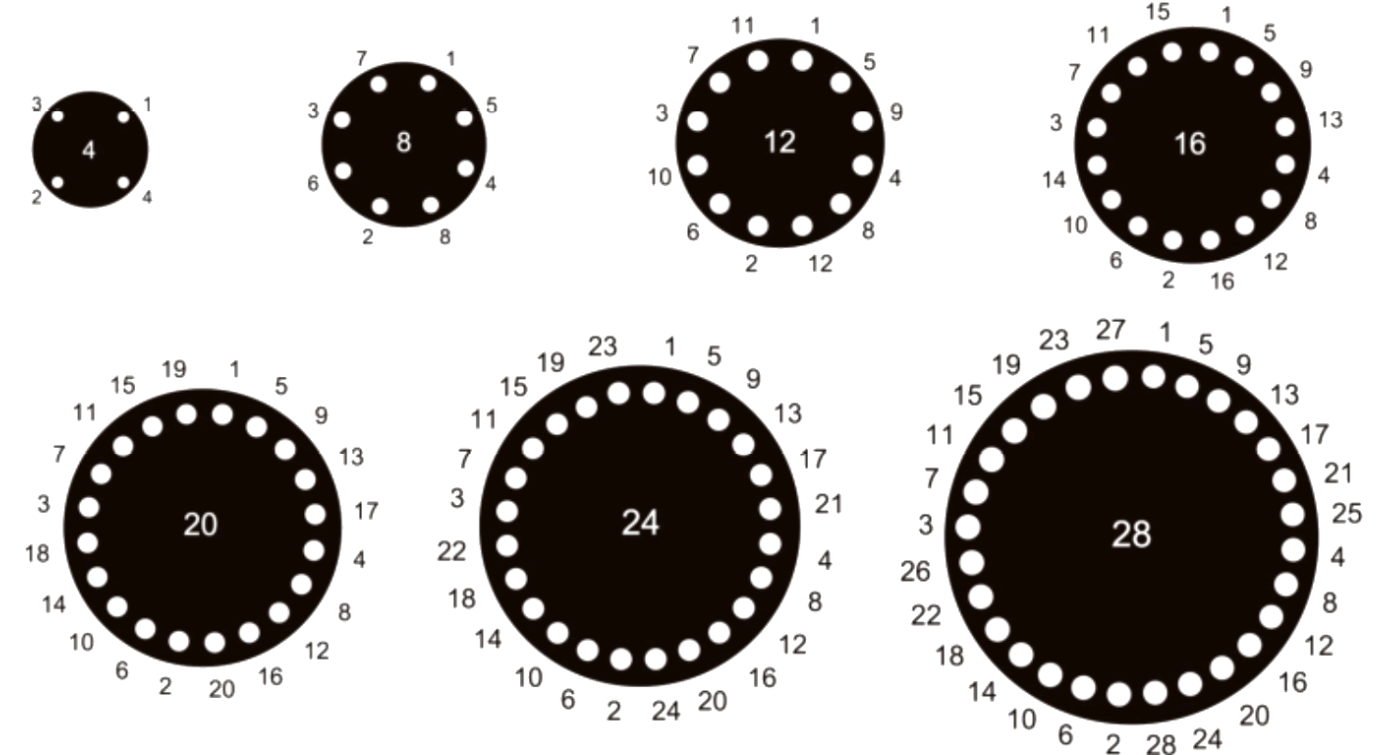


The control rod assemblies are pre-set at the maximum allowable expansion and/or contraction of the joint during the commissioning or operating. It is strictly recommended for unanchored/unsupported systems and also spring-mounted pumps or equipment. Control rod joints must be strictly used when the movement/pressure exceeds the permissible limit.

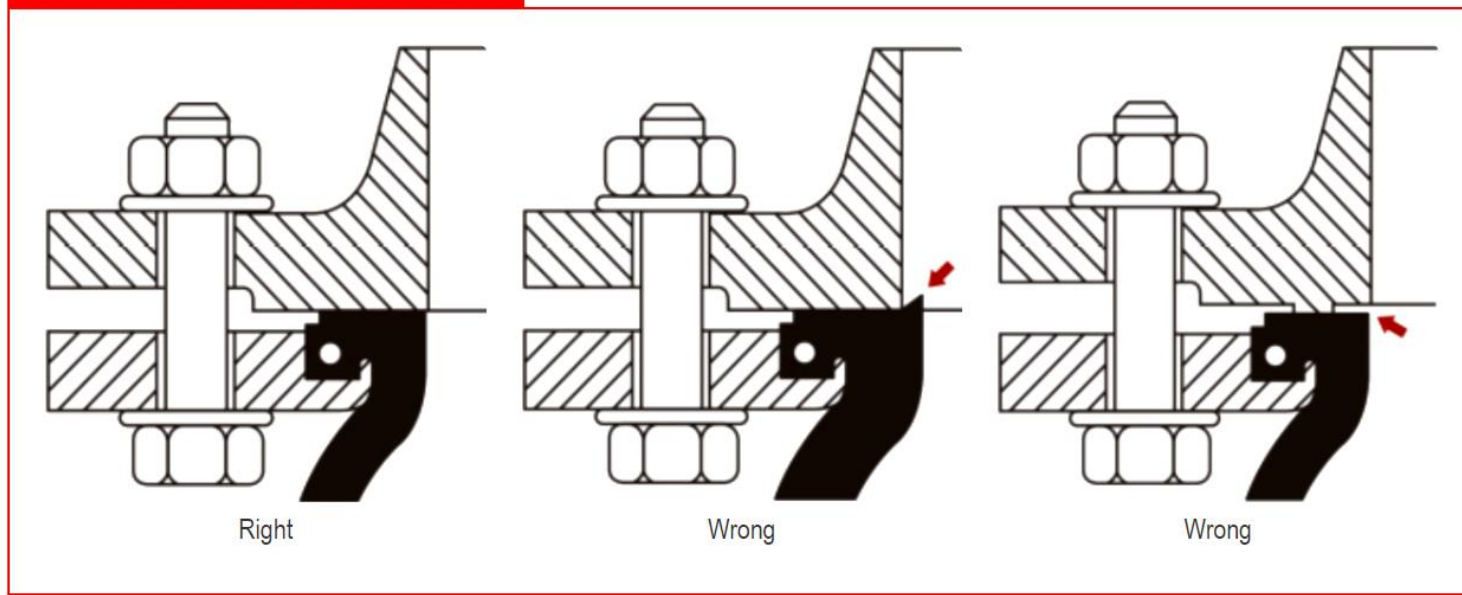
**INSTALLATION CAUTIONS 3**



- Insert the bolts in the flanges with the heads toward the joints. Tighten the bolts in opposite pairs.
- The bolts and nuts shall be tightened in progressive and crosswise with bolting pressure evenly distributed.
- Tighten opposing nuts/bolts gradually according to the following sequence.

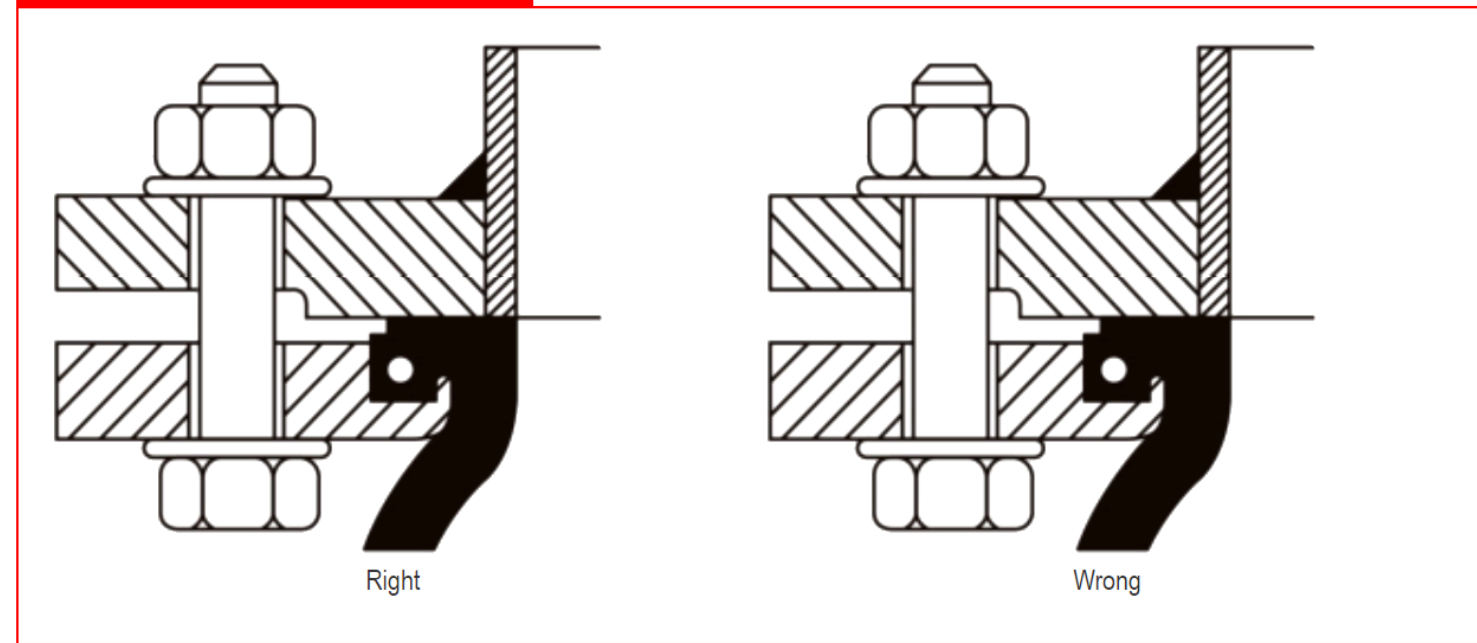


**INSTALLATION CAUTIONS 4**



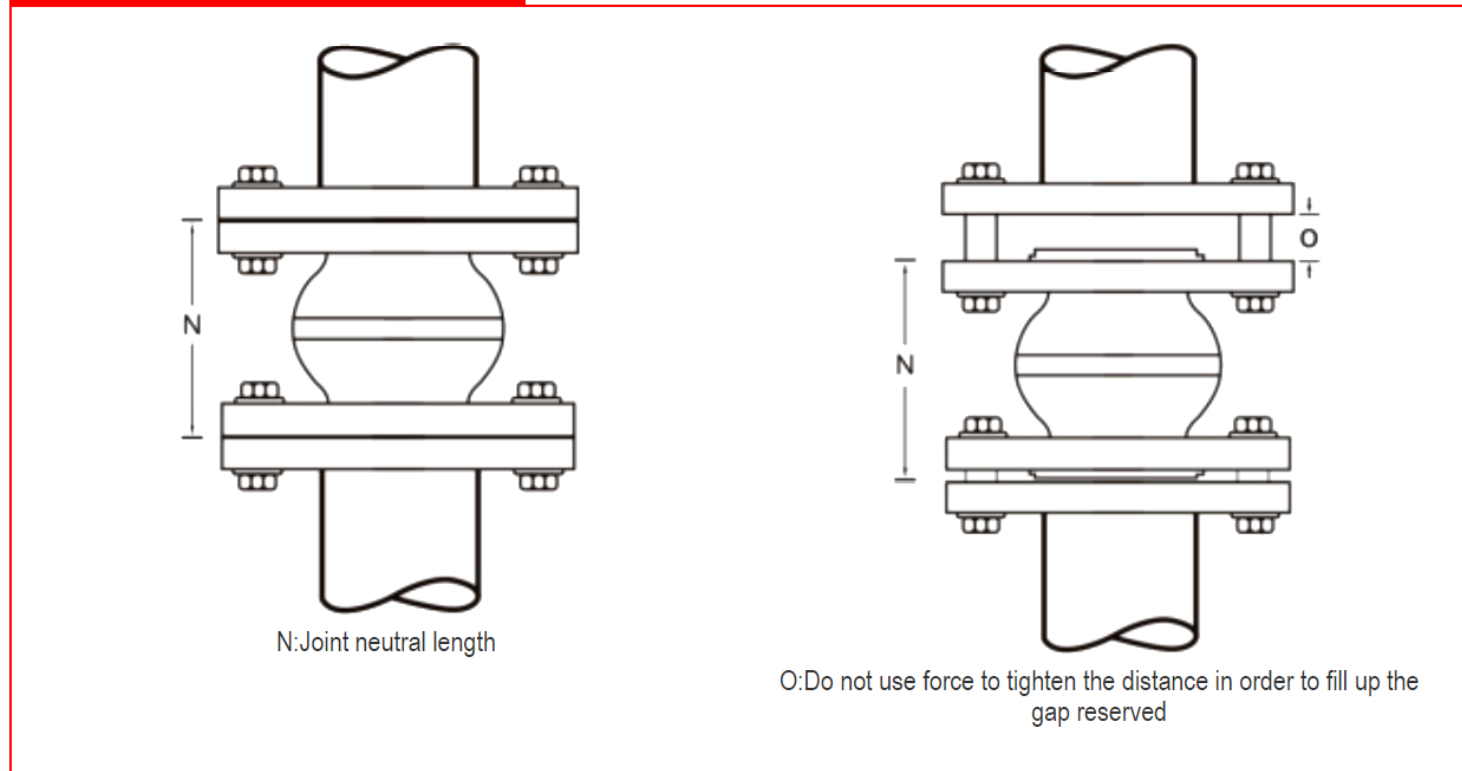
- ❗ The use of the right connection flange is important when fixing the SunnySteel rubber joints. The right connecting flange provides a safe connection and prevents leakage as well as turbulence (pressure loss).
- ❗ The connecting flange should cover a maximum of the seating surface of the joint.

**INSTALLATION CAUTIONS 6**



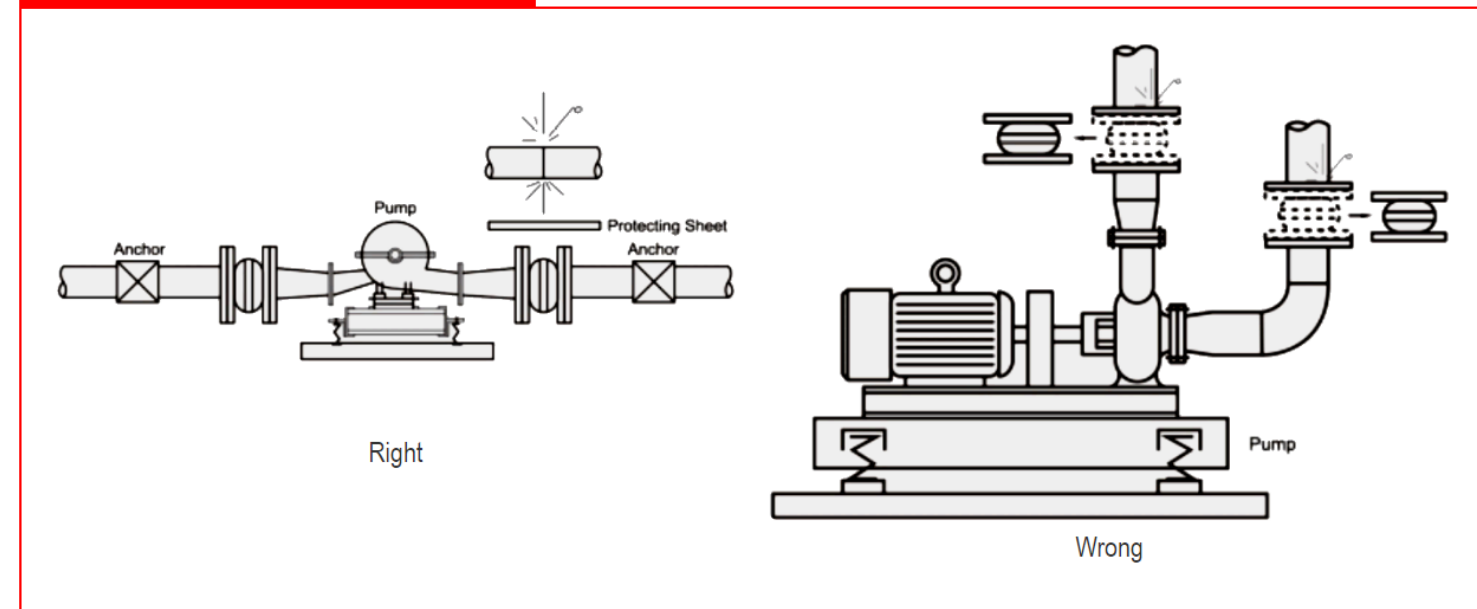
- ❗ Protruding sharp pipe ends shall be strictly avoided as it causes damage to/cuts off the rubber joint contact surface.

**INSTALLATION CAUTIONS 5**



Installation of the SunnySteel joint shall be carried out while maintaining the existing state. Do not use force to tighten the distance in order to fill the reserved gap.

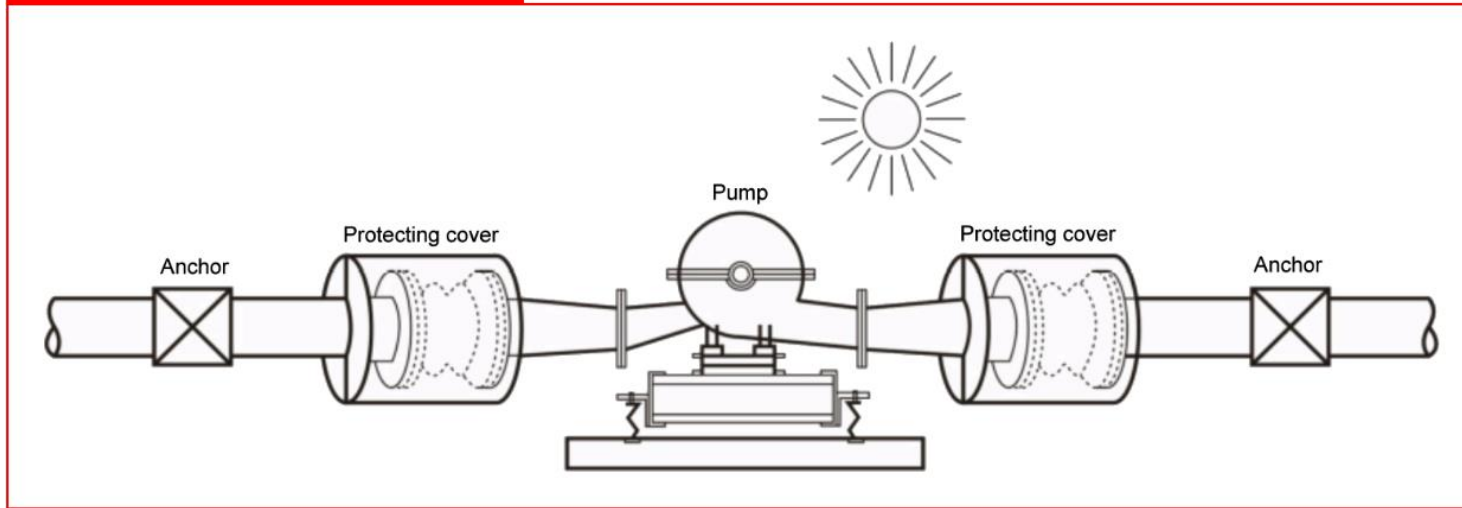
**INSTALLATION CAUTIONS 7**



- ❗ SunnySteel joint is made of rubber.
- ❗ Heat shall strictly be avoided during installation.
- ❗ Particular care shall be taken against sparks from welding, grinding, etc. near the spot of joint installation.

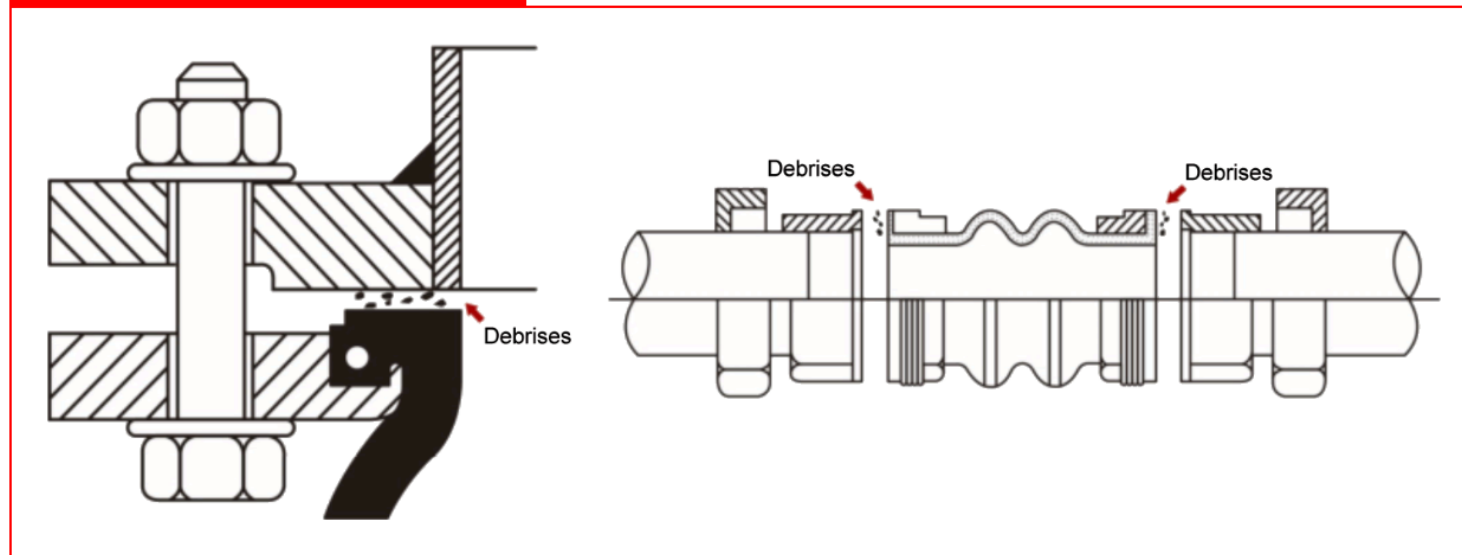


**INSTALLATION CAUTIONS 8**



- Particular care shall be taken to avoid the Sunny Steel joints' direct exposure to sunlight in case of outdoor piping.

**INSTALLATION CAUTIONS 9**



- Before fixing the Sunny Steel joint, make sure the rubber joint/flange surface is cleared of welding/threading debris, oil, paint, etc.
- Particular care shall be taken to ensure the storage area is kept clean.

**RUBBER JOINT TYPICAL PIPELINE LAYOUT**

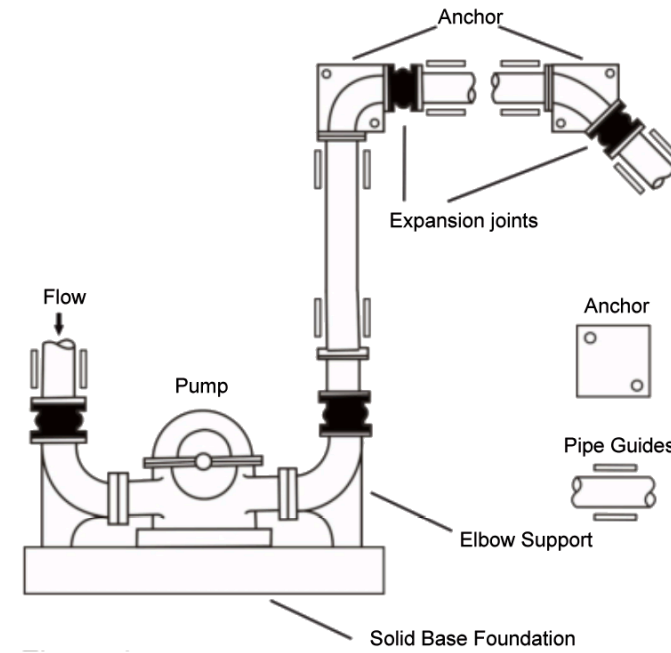


Figure 1:  
Typical Piping Layout Utilizing Expansion Joints When Equipment And Piping Are Properly Anchored.

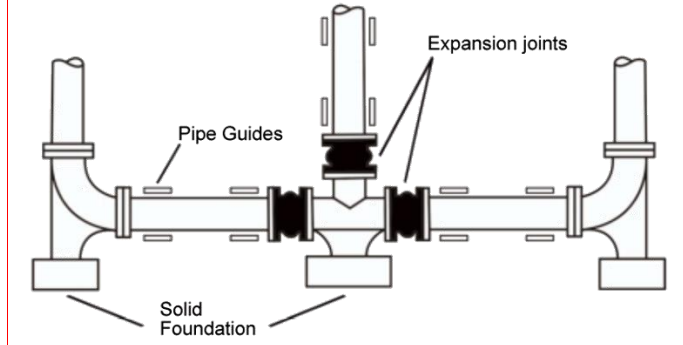


Figure 2:  
Typical Piping Layout Utilizing Expansion Joints and the Proper Use of Anchors in Branch Locations.

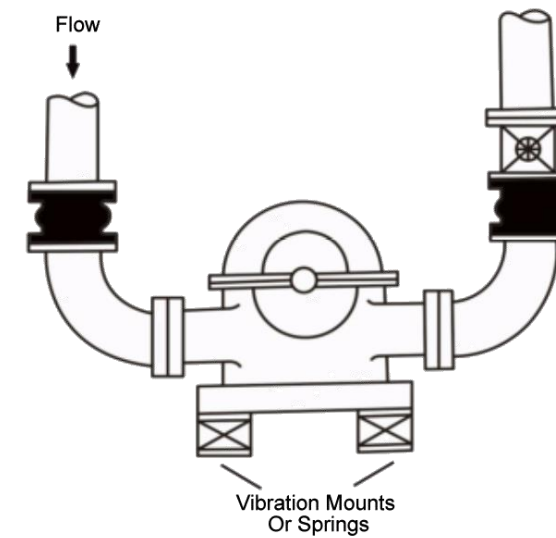


Figure 3:  
Typical Pump Installation With SunnySteel Expansion Joints Utilizing Vibration Mounts.

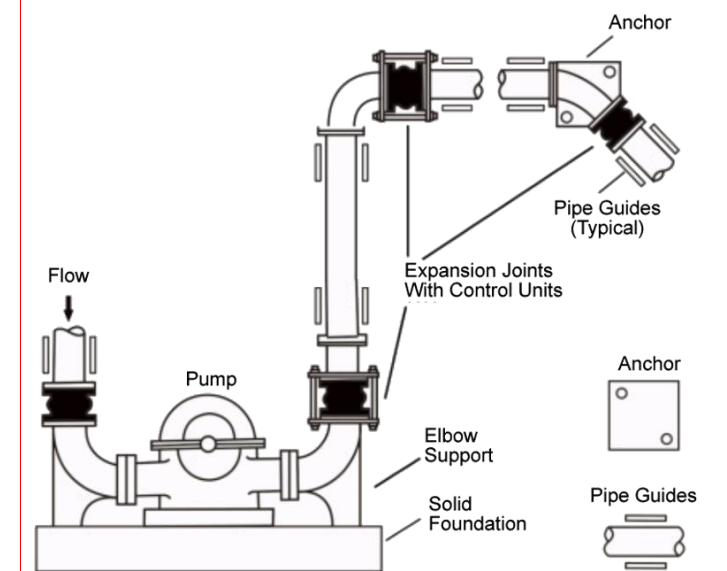


Figure 4:  
Typical Piping Layout Showing The Use Of SunnySteel Where Proper System Anchoring Is Limited.



# Rubber Expansion Joint Installation and Maintenance Manual



## Part I - Prepare and install

After receiving the equipment, first check whether the list of equipment is in conformity with the object.

Check the equipment one by one to see if there is any collision and damage in the transportation process. If there is any damage, it should be solved in time.

Installation should be done according to the installation sketch and installation location before the installation of equipment.

Before installation, debris such as clay adhering to the equipment during transportation should be removed.

When installing the equipment in the pipeline, we should try our best to keep it in a natural state, avoid forced connection, especially deform the equipment, which leads to early damage of the equipment, and weakens the service effect and life.

When the equipment is connected with the flange, first compare hole with hole. Due to the revers flange of the ball is deformable, the revers flange hole of the spherical can be corrected by prying if there are errors.

When buried, a geographic protective cover should be installed to remove the hard soil around the equipment and put it on the sand for protection.

## Part II - Installation cautions (Rubber joints shall not be installed until the installation precautions are clearly recognized.)

Use within the allowable range of temperature, pressure, medium and displacement. (Refer to catalogue or contact us for confirmation.)

Runtaida - Rubber joints should be installed in natural state or within 5 mm of compression. The allowable displacement should not be regarded as the allowable error value of installation, so as to avoid early damage when the product is installed.

There must be fixed anchor or pipes guides in the pipeline, and the fixed support force must be bigger than the axial displacement force. If the fixed support force of the pipeline is less than the actual axial displacement force of the Runtaida rubber joint, the limit anti-pull-off device should be installed and adjusted to the allowable safe displacement.

Loosen all the bolts during installation, install according to the product drawing, align with the relative flange first, install all the bolts, add the spring pad, and tighten the cross diagonal one by one. When assembling bolts, the thread tip must be pointed to the outside of the ball to avoid damaging the ball when it expands.

Rubber joints should avoid contact with sharp objects, coatings brushed with organic solvents and thermal insulation materials, and avoid welding spark burns.

When Runtaida rubber joints are used in high temperature, high pressure or chemical dangerous substance medium, additional protective measures should be taken to protect the personnel on site from being harmed in the case of leakage or splash.

## Part III - Operation and Maintenance

The final inspection of the product has been done before the equipment leaves the factory.

The test pressure of the equipment is 1.1 times the design pressure.

As long as the installation instructions are strictly followed, it can be put into operation.

Within 48 hours of operation, a special person should be set up to check whether the connecting bolt is loosened or not.

The loosening of connecting bolts should be checked regularly for equipment installed in a vibration environment.



Add.: SOUTH YANGGAO RD NO.2875, SHANGHAI, 200125, CHINA

Tel.:+8621 3378 0199

WhatsApp: +86 139 1692 7033

Web: www.sunnysteel.com

Email:sales@sunnysteel.com



*Due to limited space, this manual only introduces some of the finned tube products, and other products are not listed in detail.*

*We apologize for any inconvenience.*

*For a more comprehensive understanding of finned tubes, please visit our company's website or contact us for more information.*

