

Closer Joint

Sigma

Σ2 Model

General Catalog

Quake-resistant and quake-absorbing expansion
flexible pipes to be buried



Σ2 with a cover

THE VICTAULIC COMPANY OF JAPAN LIMITED



IMPORTANT INFORMATION FOR SAFE USE

- In order to use the product safely, be certain to read and understand the "Installation Manual" before proceeding with any work.
- There are places on these joints that may be sharp so always wear the proper work gloves and appropriately protect hands before performing any work.
- If you have any questions or concerns regarding your installation, please contact a agency or our office.

THE VICTAULIC COMPANY OF JAPAN LIMITED

Head office	〒106-0032 Roppongi Azabudai Bill 4F, 1-8-7, Roppongi, Minato-ku, Tokyo TEL: (03) 5114-8531 FAX (03) 5114-8532
Osaka branch	〒530-0003 Keihan dojima Building, 2-1-31, Dojima, Kita-ku, Osaka TEL: (06) 6341-3556 FAX: (06) 6341-0447
Nagoya branch	〒450-0002 1st hall, Nagoya-Daiya Building, 3-16-22, Meieki, Nakamura-ku, Nagoya TEL: (052) 541-1331 FAX: (052) 541-1334
Sapporo branch	〒060-0001 Takeda-Resona Building, 4-1-2, Kita-Ichijo-Nishi, Chuo-ku, Spporo TEL: (011) 241-0021 FAX: (011) 222-5848
Fukuoka branch	〒812-0012 The Second Hakata Kaisei Building, 1-10-4, Hakata-eki Minami, Hakata-ku, Fukuoka TEL: (092) 431-8208 FAX: (092) 461-0068
Kobe plant	〒651-2228 2-3-2, Mitsugaoka, Nishi-ku, Kobe TEL: (078) 994-6721 FAX: (078) 994-6728
Shiga plant	〒520-3035 3-14-63, Ryozenji, Ritto-shi, Shiga TEL: (077) 553-5121 FAX: (077) 553-5124
●homepage	http://www.victaulic.co.jp (mail : info@victaulic.co.jp)

agency

Note

Specifications, dimensions, and other product features in this catalog are subject to improvements and changes.
Please confirm product specifications before proceeding with design.

Σ2 Model

Quake-resistant and quake-absorbing expansion flexible pipes to be buried

GENERAL CATALOG

To protect pipes from earthquakes

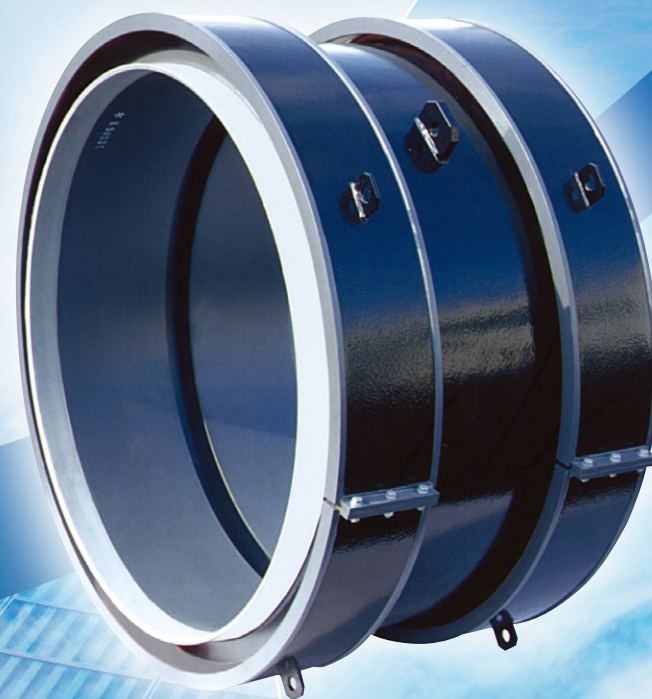
Introduction

Many Closer Joints have been used since 1961, as expansion flexible pipes that can mitigate the effects of ground subsidence and unequal settling. Closer Joints have been securing the safety of pipes as quake-proof expansion flexible pipes, which did not go against past earthquakes, but move with them freely to secure the functions of pipes surely.

Considering the recent aseismic design of pipe line and preserving special characteristics of absorbing complex displacement with the concept "quake-resistance + quake-absorption", we have developed the expansion flexible joint "Σ2 with cover" which can prevent detachment and "Σ2-EX" which is more expandable.

We believe that these products will be helpful as expansion flexible joints to make counter measures for the earthquake affecting pipe line, water supply, sewerage, industrial water supply, agricultural water supply, electric power plant.

P i p e l i n e



Σ2 with a cover

Obtained the ISO9001 and 14001 certifications, international quality assurance for boosting reliability.

We will meet the needs of the 21st century with globally reliable cutting-edge technologies and products.

Our products and technologies have been adopted broadly for waterworks, sewerage, industrial and agricultural water supply, civil engineering, construction equipment, machinery, plants, etc. We constructed 5 sales offices and 2 factories in Japan, to contribute to enriching our future.

In order to satisfy growing global needs, our factories obtained the ISO9001 and 14001, international quality control and assurance standards, in Apr. 1996.



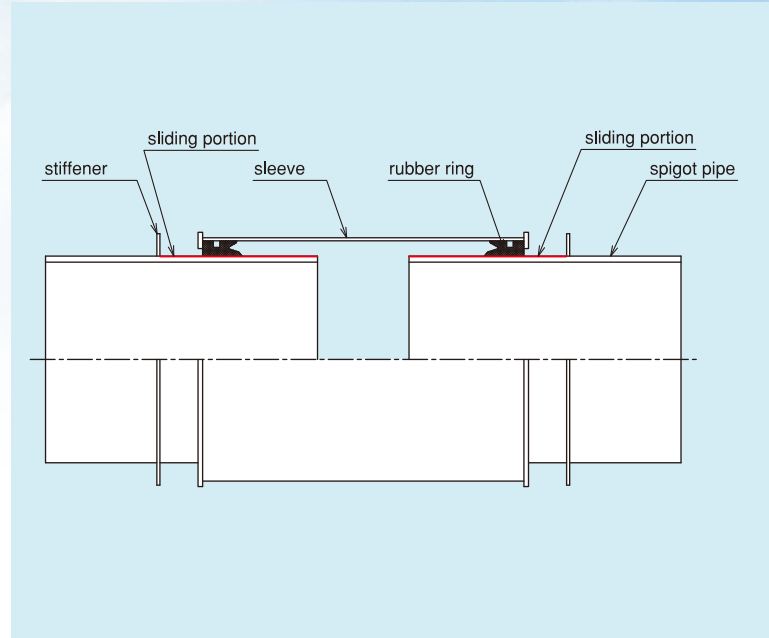
Table of contents

Features	3	●EX model	14
Introduction of optional products		●High pressure type	15
With tie-rods	5	High pressure type with tie-rods	16
With a cover	6	●Insulation type	
EX model	7	Without tie-rods	17
Connection methods	9	With tie-rods	17
Example of use for each purpose of use	10	Reference material for the insulation type	18
Dimensions and performance		Functionality tests	19
●Standard type	11	Examples of installation	20
With tie-rods	12	Items of specs at the time of order	
●With a cover	13	placement	21

Japan's original expansion flexible joints tolerate a broad range of expansion, contraction, angular deflection, lateral displacement, and distortion.

Features

Closer joint Σ2 model is expansion flexible joint of double-pipe slidable type. It is composed three parts, first: a sleeve which has larger dimension than spigot, second: two spigot which connect with main pipe, and third: special shaped rubber ring which work as sealing material. Major materials are standard ones, including rolled steel for general structures and arc-welded carbon steel pipes for piping. We also produce rubber rings from synthetic rubber, such as SBR, NBR, CR and EPDM according to usage conditions. As for coating, we basically use liquid epoxy resin for water supply on sealing and sliding surfaces. On the other internal and external surfaces, we choose best coating refer to usage condition and customer's requirements. Depend on burial condition, we calculate and design to keep the strength of spigot pipe with stiffener against external pressure.



Materials

Sleeve and spigots	SS400 SM490A SUS304 etc.	Rubber rings	SBR · NBR · CR · EPDM *Rubber rings are selected according to used fluid, temperature, and condition.
--------------------	-----------------------------------	--------------	--

Coating

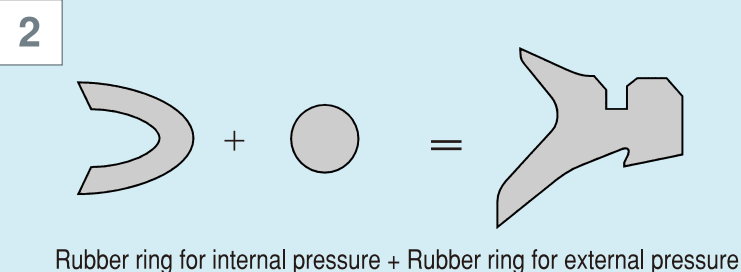
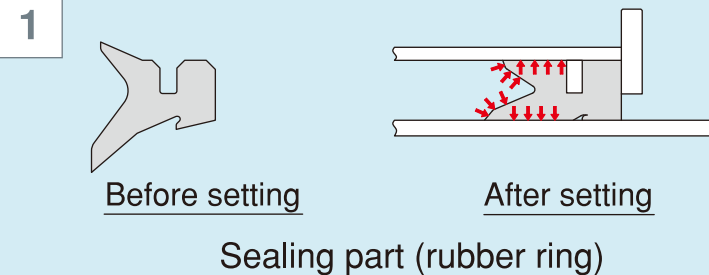
Internal and external surfaces and sliding surface Coating with liquid epoxy resin for water supply Coating with solvent-less epoxy resin for water supply Coating with tar epoxy resin	External surface Polyurethane coating Tar epoxy resin coating * Other coating is available. Please contact us.
--	---

1 Long lasting sealing performance

We developed a special shaped rubber ring for automatic sealing; it can tolerate the displacement and deformation. Because of that function, stress does not emerge on rubber ring and it is durable.

2 Sealing mechanism for measures with internal and external pressures

A rubber ring was developed by combining two kinds of rubber rings for measured with internal and external pressures, to achieve a safer sealing mechanism.



3 Larger expansibility and flexibility

A slidable double-pipe type can absorb the large angular deflection and expansion and contraction using the gap between the sleeve and spigot pipes.

4 Lateral displacement can be considerably absorbed with a short gap between surfaces.

Σ type can absorb larger displacement than normal double-pipe flexible joint because of using special shaped rubber ring.

5 Complex motion can be absorbed.

Expansion, contraction, and distortion can be absorbed even after the absorption of subsidence.

6 Distortion of pipes can be absorbed.

This is a double-pipe type, and a rubber ring slides on a spigot pipe, and so it can rotate 360 degrees. Even if it is mounted with a tie-bolt, a torsion angle of up to 10 degrees can be absorbed.

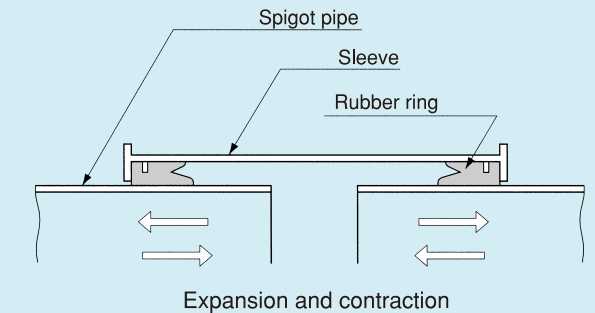
7 It is free from fatigue failure and stress destruction.

Thanks to its structure, there is no problem for strength that customer normally worried about cyclic fatigue by expansion, contraction, deflection, and distortion.

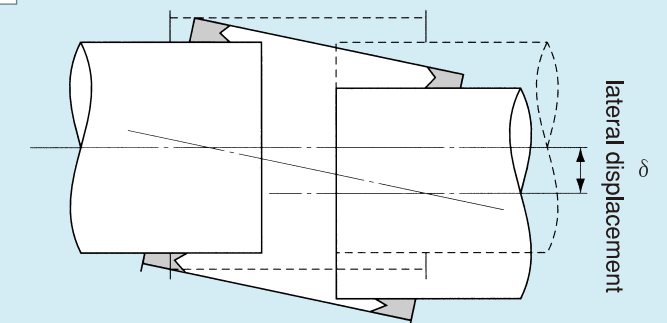
8 Operation load is small so that it does not affect other components.

Operation resistance is limited to the friction of the rubber ring. It can readily act on external force, because there is no opposite reaction as the spring constant.

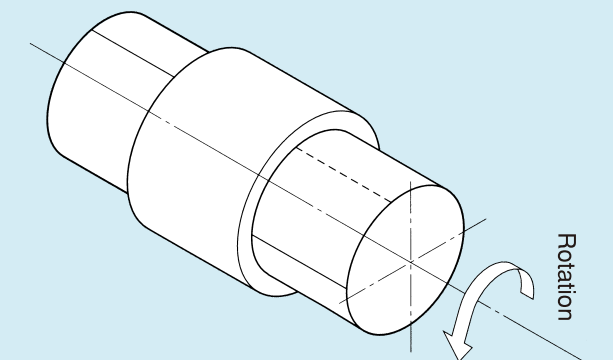
3



4



6



9 It can be buried as it is, and it has excellent anticorrosive performance.

Since the number of components is limited and its shape is simple, anticorrosive performance can be improved by coating. It is also suited for buried pipes.

10 It can be connected with ductile pipes.

This is lightweight compared with ductile ball joints. It can be produced according to required lateral displacement.

Introduction of optional products

Mounted with tie-rods

Tie-rod type

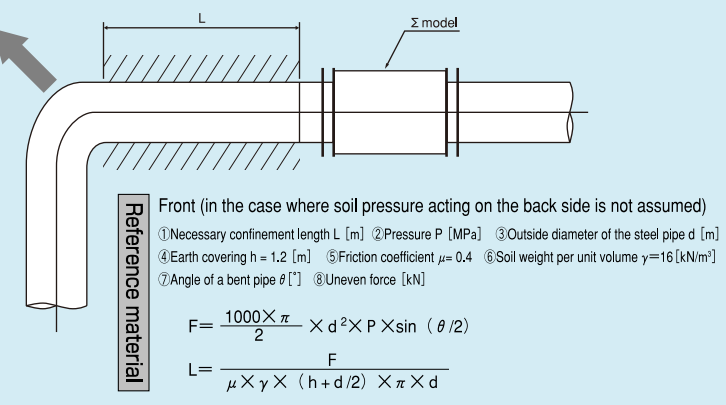
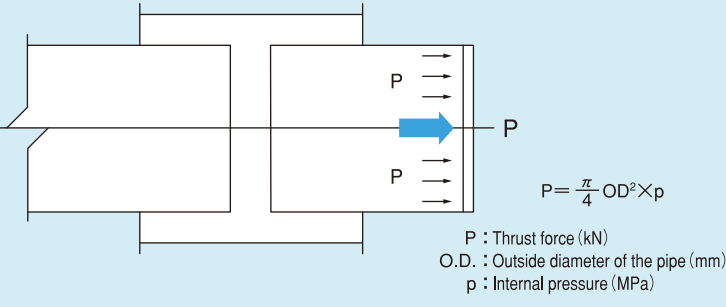
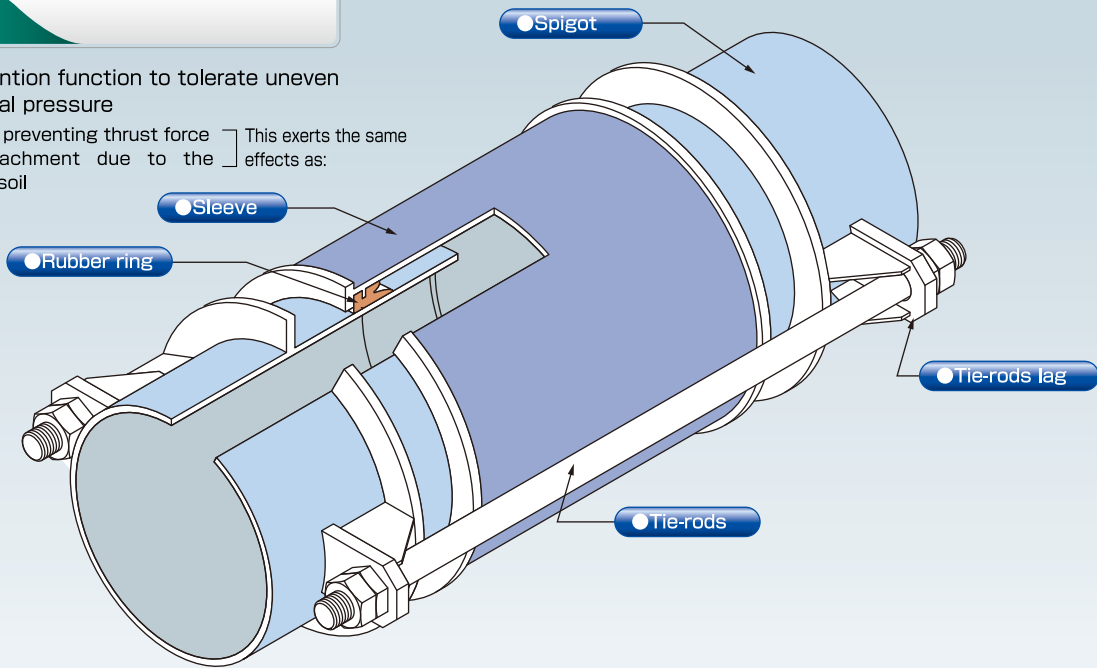
Tie-rods

Features

Detachment prevention function to tolerate uneven force due to internal pressure

- A concrete block for preventing thrust force
- Prevention of detachment due to the confined pressure of soil

This exerts the same effects as:



Thrust force (kN)			
Diameter / internal pressure	0.75MPa	1.0MPa	
100A	7.7	10.3	
200A	27.6	36.7	
300A	59.8	79.7	
400A	97.3	130	
500A	152	203	
600A	219	292	
800A	389	519	
1000A	608	811	
1200A	876	1170	
1500A	1370	1820	
1800A	1980	2640	
2000A	2450	3260	

Soil confinement length (L) unit m					
Diameter / internal pressure	0.75MPa		1.0MPa		
	90°	45°	90°	45°	
100A	3.77	2.04	5.03	2.72	
200A	6.86	3.71	9.14	4.95	
300A	9.71	5.26	12.95	7.01	
400A	12.00	6.50	16.00	8.66	
500A	14.48	7.84	19.31	10.45	
600A	16.79	9.09	22.38	12.12	
800A	20.97	11.35	27.96	15.13	
1000A	24.65	13.34	32.87	17.79	
1200A	27.92	15.11	37.22	20.15	
1500A	32.19	17.42	42.92	23.23	
1800A	35.88	19.42	47.83	25.89	
2000A	38.06	20.60	50.74	27.46	

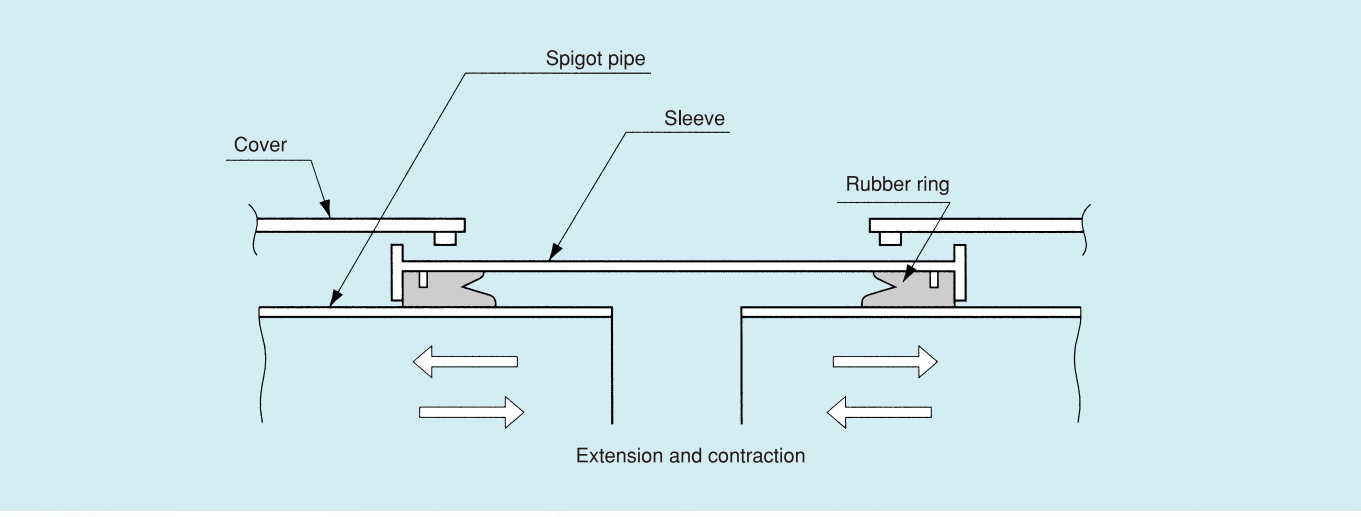
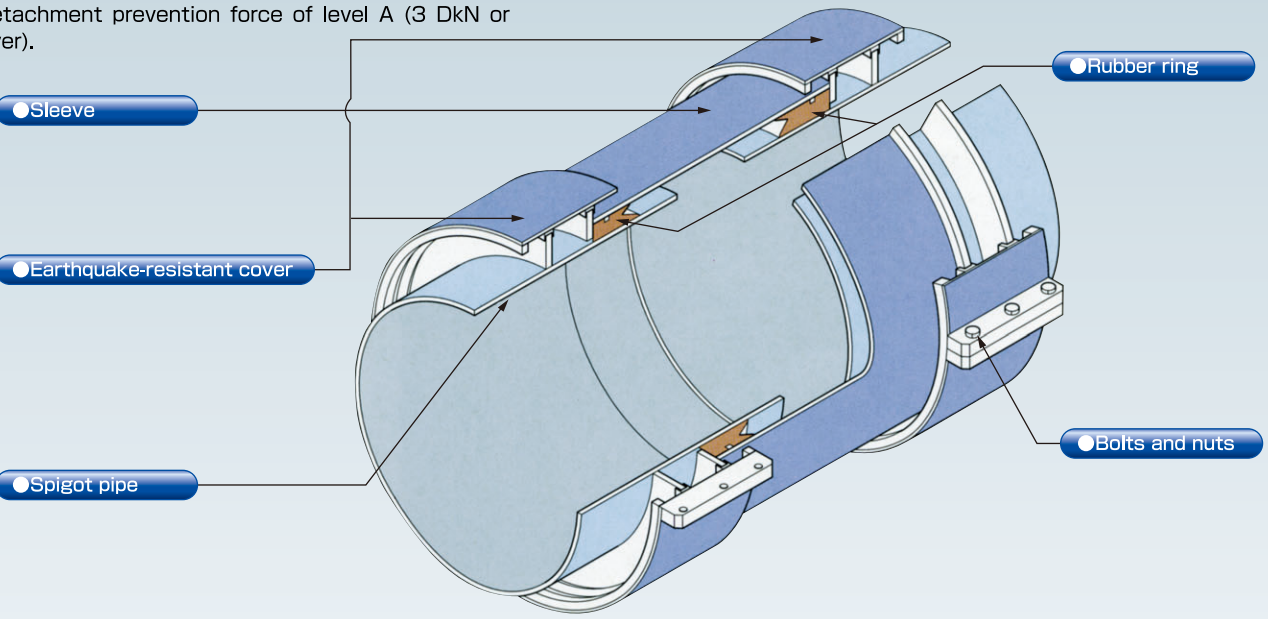
Mounted with a cover

Stopper method

With a Cover

Features

With an earthquake-resistant cover, it has detachment prevention force of level A (3 DkN or over).



If the uneven force due to internal pressure is larger than the friction force between soil and the outer surface and so there is a possibility that the expansion flexible pipe will come out, it will become necessary to discuss the use of thrust blocks or tie-rods.

Stopper method

If displacement exceeds the specified displacement of the expansion flexible pipe (tolerable displacement in general) without tensile force on the stopper under normal conditions, it will be set for curbing the displacement of the expansion flexible pipe (in the direction of the pipe axis). In the stopper type, detachment prevention force shall be 3 DkN or over.

Excerpt from "WSP 024-2013 4.1.3 Detachment prevention function"

Tie-rod method

In order to cope with uneven force due to internal pressure around the buried bent pipe, tie-rods are set, and the detachment of an expansion flexible pipe is prevented.

Excerpt from "WSP 024-2013 4.1.3 Detachment prevention function"

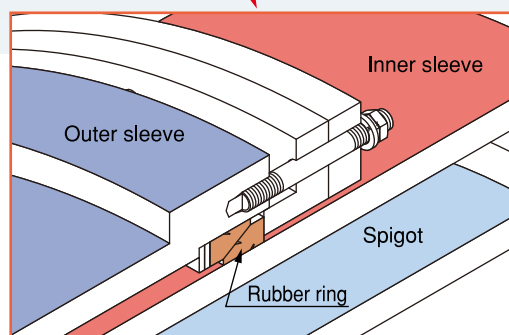
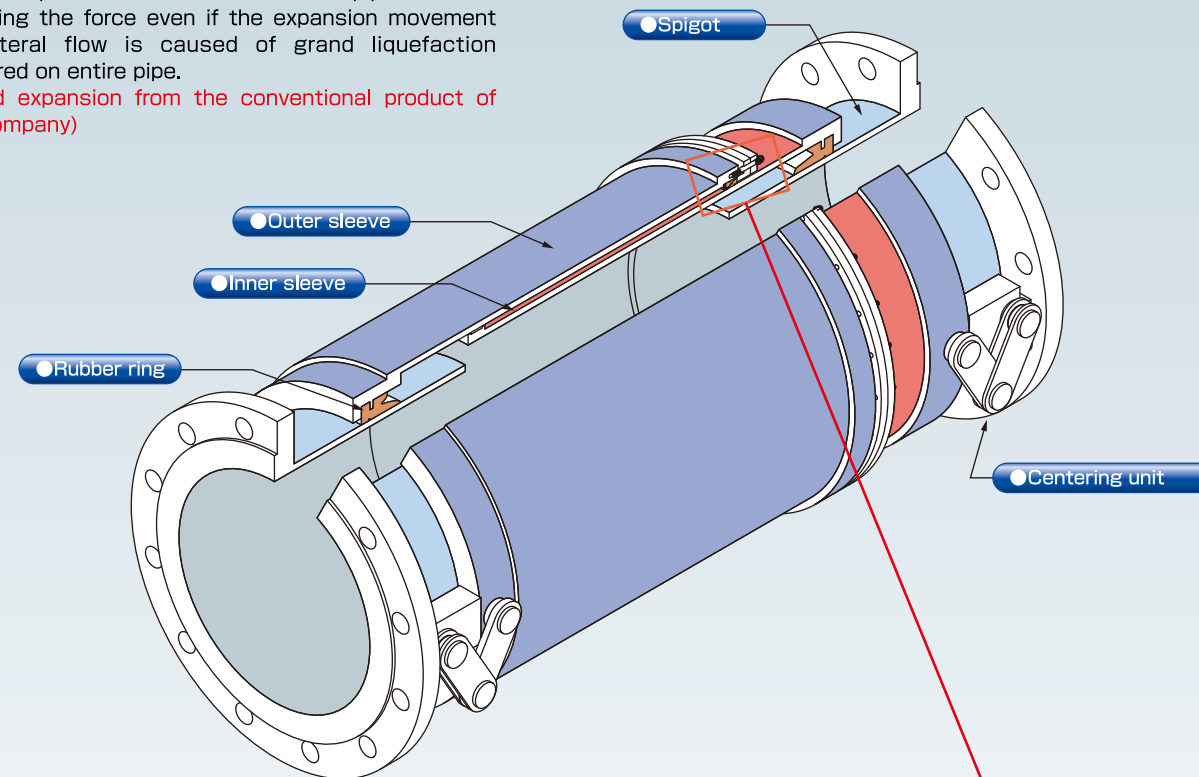
Introduction of optional products

EX model

With EX

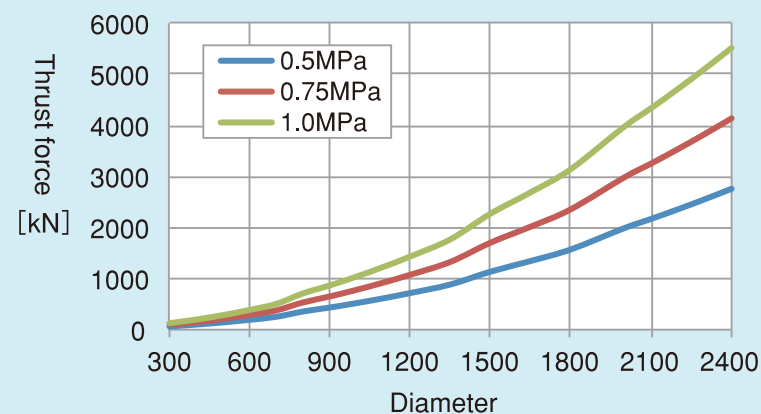
Features

A highly safe next-generation expansion joint which has great absorption performance against lateral direction prevents the detachment of pipes without resisting the force even if the expansion movement by lateral flow is caused of grand liquefaction occurred on entire pipe.
(5-fold expansion from the conventional product of our company)



If the pipe expands beyond the normal displacement range, the inner sleeve functions to offset the significant extension.

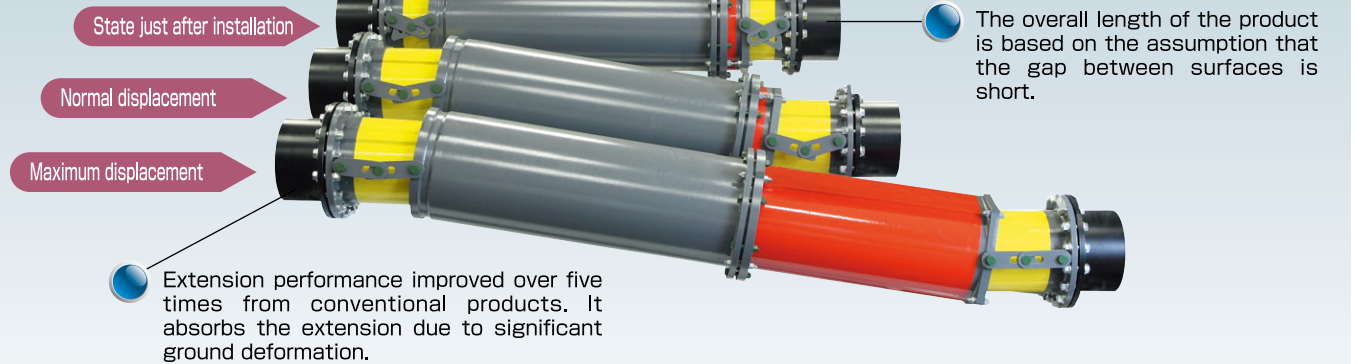
Graph of the thrust force of the EX model



To cope with significant displacement due to ground deformation, such as ground liquefaction caused by an earthquake, pipe joints shall have the function to cope with complex displacement, including normal displacement and significant one due to liquefaction or the like, and also the detachment prevention function (stopper method), or the function to offset significant extension.

Excerpt from "WSP 024-2013 4.1.3 Detachment prevention function"

Operation states



Functionality tests Σ2-EX 600A

State just after installation



- Standard (basic measurement)
- Water pressure: 1.5 MPa
- No abnormalities

Normal displacement



- Expansion: 0mm
- Lateral displacement: 200mm
- Water pressure: 1.5MPa
- No abnormalities

Maximum displacement



- Expansion: 1000mm
- Lateral displacement: 300mm
- Water pressure: 1.5MPa
- No abnormalities

Methods for attaching the product

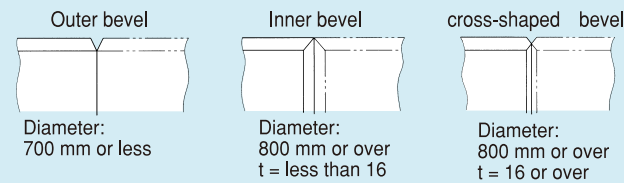
Example of each purpose of use

The Σ2 model can be connected to not only steel pipes, but also cast iron pipes, hume pipes, reinforced plastic complex pipes, etc. by processing pipe edges.

1.In the case of steel pipes

- Welding
- Flange connection

● Welded coupling



- Flange couplings (We can produce them according to standards.)
JIS G3443-2 F12~F29
JIS B2220 5k~20k
Etc. ASTM/ISO ETC.



3.In the case of concrete pipes, such as PC pipes

- PC pipe couplings, sockets, insertion openings

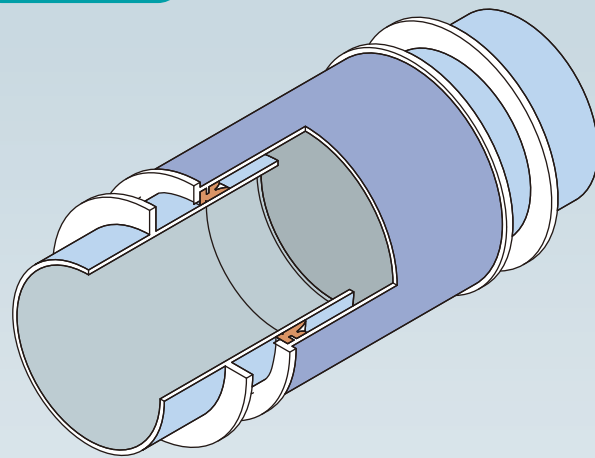
4.Other pipes

As for other special pipes, please consult with us.

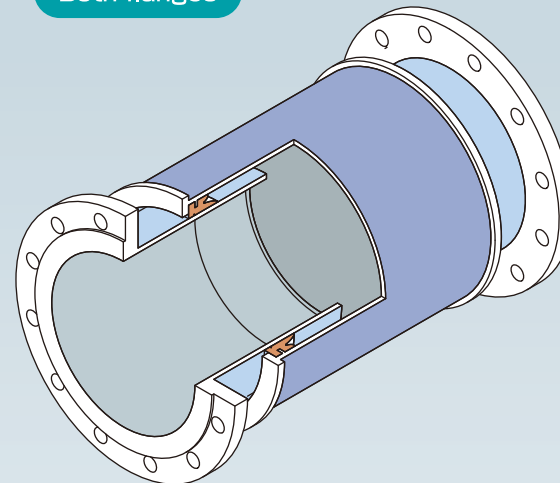
2.In the case of cast iron or reinforced plastic complex pipes

- Mechanical coupling, FRPM pipes, sockets, insertion openings
- Flange connection

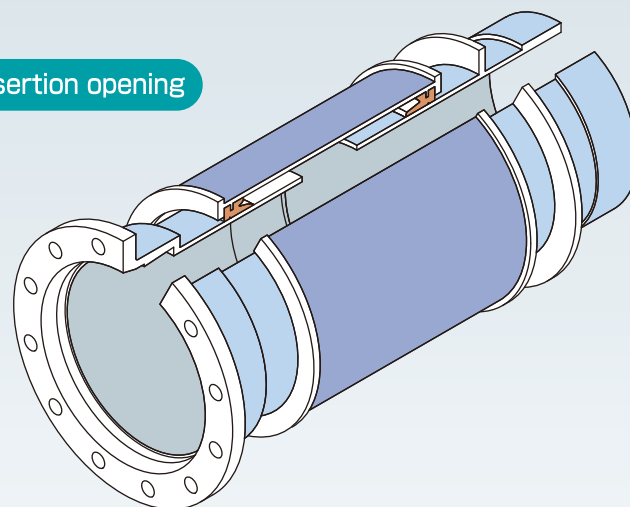
Both bevels



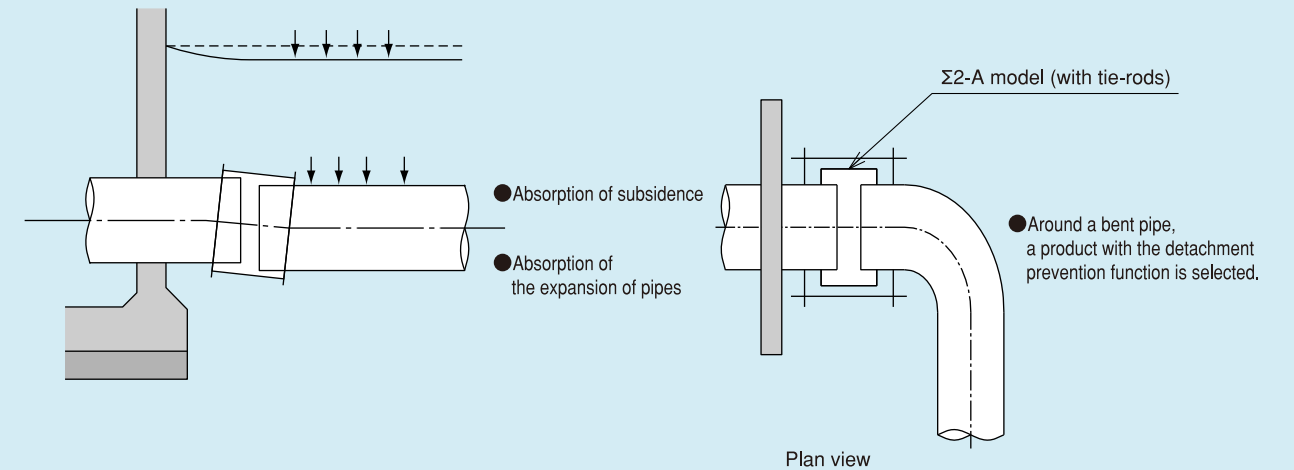
Both flanges



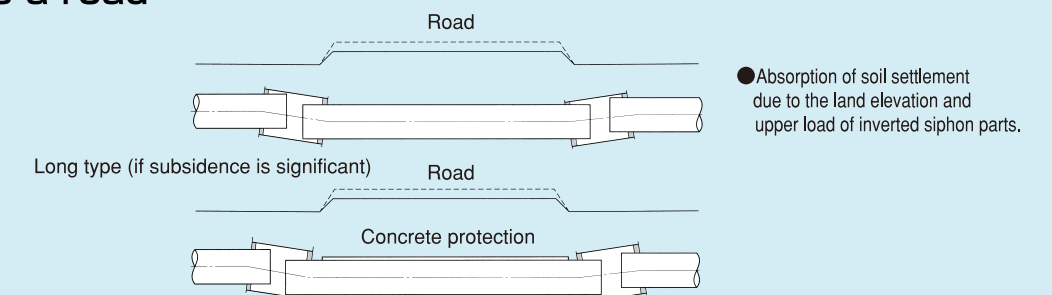
A socket and an insertion opening



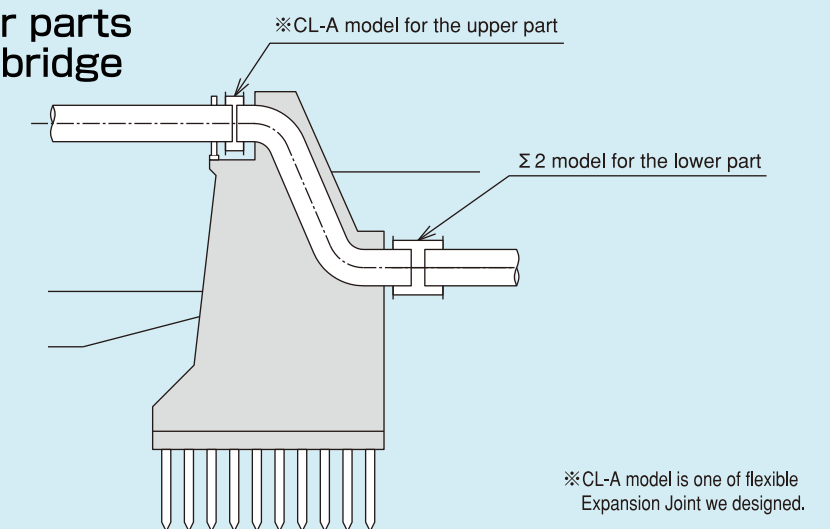
1 Around a structure



2 Across a road



3 Upper and lower parts of an aqueduct bridge

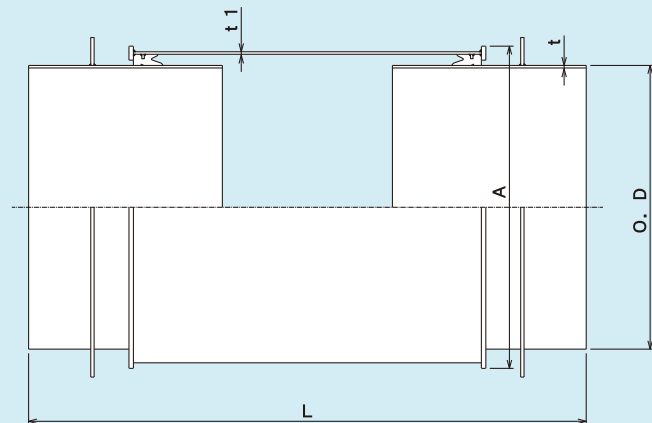


Dimensions and performance

Σ2-A model, standard type

Normal pressure: 1.0 MPa
Test pressure: 1.5 MPa

Standard Type



Nominal diameter	Spigot pipe		Sleeve		Expansion and Contraction		Lateral displacement			
	O.D	t	A	t1			100 mm lateral displacement type		200 mm lateral displacement type	
							L	Weight [kg]	L	Weight [kg]
50	60.5	3.8	114.3	4.5	+ 85	- 90	1150	22	1750	27
80	89.1	4.2	139.8	4.5	+ 85	- 90	1150	27	1750	37
100	114.3	4.5	165.2	5	+ 90	- 90	1150	38	1750	53
125	139.8	4.5	190.7	5.3	+ 90	- 90	1150	43	1750	58
150	165.2	5	241.8	8	+100	- 90	1150	75	1750	100
200	216.3	5.8	311	10	+115	- 80	1200	92	1800	140
250	267.4	6.6	369	8	+115	- 80	1200	100	1800	145
300	318.5	6.9	408	6	+115	- 80	1200	110	1800	150
350	355.6	7.9	448	6	+125	-100	1250	140	1850	185
400	406.4	7.9	500	6	+130	-100	1250	170	1850	220
450	457.2	7.9	553	6	+140	-100	1250	190	1850	240
500	508	6	603	6	+140	-100	1300	190	1900	250
600	609.6	6	716	6	+150	-100	1350	250	1900	310
700	711.2	6	818	6	+155	-100	1400	305	1950	385
800	812.8	8	935	8	+165	-100	1400	415	1950	525
900	914.4	8	1050	8	+175	-100	1400	500	1950	620
1000	1016	9	1154	9	+150	-100	1400	650	2000	830
1100	1117.6	12	1258	9	+160	-100	1450	825	2000	1020
1200	1219.2	12	1360	10	+170	-100	1500	970	2050	1200
1350	1371.6	12	1542	10	+175	-100	1500	1150	2050	1420
1500	1524	14	1697	10	+185	-100	1550	1540	2100	1850
1650	1682	16	1877	12	+190	-100	1750	2200	2250	2600
1800	1832	16	2032	12	+195	-100	1750	2400	2300	2850
2000	2038	19	2237	16	+205	-100	1800	3300	2350	4000
2100	2138	19	2338	16	+215	-100	1850	3500	2350	4200
2200	2238	19	2440	16	+220	-100	1850	3700	2350	4400
2300	2344	22	2546	19	+225	-100	1900	4500	2400	5400
2400	2444	22	2647	19	+235	-100	1900	4700	2400	5600

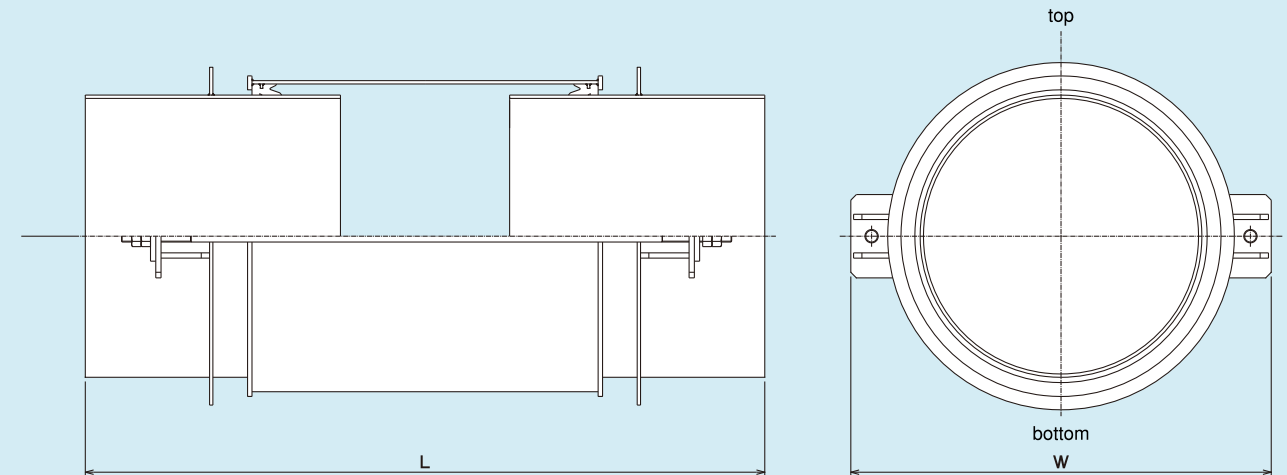
※Both bevels (compatible with joint coating)

Notes: We can adjust length (L) and lateral displacement. Please share us spec.
This is the inter-surface length (L) that is compatible with the coating for welded parts (joint coating).
We can designed and produce joints not tabulated above. Please contact us.
We can also design and produce joints with an lateral displacement of 300 mm or over.

Σ2-A model mounted with tie-bolts

Normal pressure: 1.0 MPa
Test pressure: 1.5 MPa

With Tie-rods



※Joints with tie-rods has no expansion ability.

Nominal diameter	100 mm lateral displacement type						200 mm lateral displacement type					
	0.75MPa			1.0MPa			0.75MPa			1.0MPa		
	L	Weight [kg]	W	L	Weight [kg]	W	L	Weight [kg]	W	L	Weight [kg]	W
50	1250	28	200	1250	30	200	1850	35	200	1850	36	200
80	1250	37	250	1250	39	250	1850	50	250	1850	52	250
100	1250	53	280	1250	56	280	1850	71	280	1850	74	280
125	1300	64	300	1300	67	300	1900	81	300	1900	84	300
150	1300	105	350	1300	110	350	1900	130	350	1900	135	350
200	1450	135	435	1450	150	435	2050	180	435	2050	195	435
250	1450	135	517.4	1450	140	527.4	2050	185	517.4	2050	190	527.4
300	1500	150	568.5	1500	150	548.5	2100	195	568.5	2100	190	548.5
350	1550	190	585.6	1550	185	585.6	2150	235	585.6	2150	230	585.6
400	1550	215	656.4	1550	220	676.4	2150	265	656.4	2150	275	676.4
450	1550	245	727.2	1550	255	727.2	2150	300	727.2	2150	310	727.2
500	1550	240	778	1550	250	798	2150	305	778	2150	315	798
600	1650	325	899.6	1700	345	909.6	2200	390	899.6	2250	415	909.6
700	1700	405	1031.2	1750	440	1061.2	2250	490	1031.2	2300	530	1061.2
800	1750	545	1142.8	1800	585	1162.8	2300	660	1142.8	2350	705	1162.8
900	1800	675	1264.4	1850	725	1284.4	2350	805	1264.4	2400	860	1284.4
1000	1900	910	1446	2000	985	1456	2500	1110	1446	2600	1180	1456
1100	1900	1140	1547.6	2000	1220	1557.6	2450	1340	1547.6	2550	1420	1557.6
1200	2000	1360	1659.2	2150	1510	1689.2	2550	1610	1659.2	2700	1770	1689.2
1350	2100	1680	1861.6	2200	1850	1871.6	2650	1980	1861.6	2750	2150	1871.6
1500	2250	2350	2114	2400	2650	2144	2800	2650	2114	2950	3000	2144
1650	2500	3200	2282	2650	3600	2302	3000	3600	2282	3150	4000	2302
1800	2500	3600	2452	2650	3900	2492	3050	4100	2452	3200	4500	2492
2000	2600	4800	2698	2800	5300	2718	3150	5500	2698	3350	6100	2718
2100	2700	5200	2798	2850	5700	2818	3200	5900	2798	3350	6500	2818
2200	2800	5800	2938	2950	6500	2958	3300	6500	2938	3450	7200	2958
2300	2850	6800	3054	3050	7600	3074	3350	7800	3054	3550	8600	3074
2400	2900	7200	3164	3100	8100	3184	3400	8200	3164	3600	9100	3184

※Both bevels (compatible with joint coating)

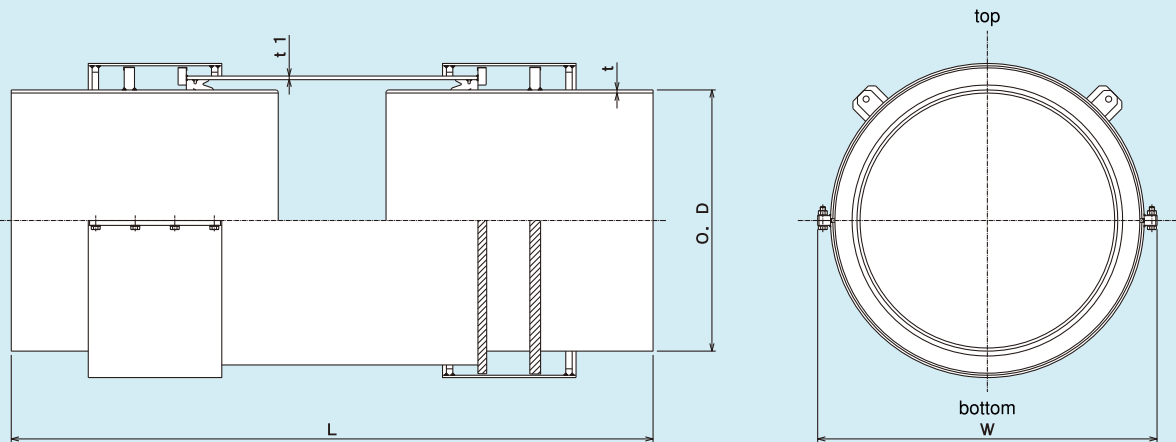
Notes: We can adjust length (L) and lateral displacement. Please share us spec.
This is the inter-surface length (L) that is compatible with the coating for welded parts (joint coating).
We can designed and produce joints not tabulated above. Please contact us.
We can also design and produce joints with an lateral displacement of 300 mm or over.

Dimensions and performance

Σ2-A model, with a cover

Normal pressure: 1.0 MPa
Test pressure: 1.5 MPa

With a Cover



Nominal diameter	Spigot pipe		Sleeve	Cover	Expansion and Contraction	Lateral displacement			
	O.D	t	t1	W		100 mm lateral displacement type		200 mm lateral displacement type	
						L	Weight [kg]	L	Weight [kg]
50	60.5	3.8	4.5	255	±100	1550	40	2100	50
80	89.1	4.2	4.5	280	±100	1550	50	2100	60
100	114.3	4.5	5.0	310	±100	1600	70	2250	85
125	139.8	4.5	5.3	335	±100	1600	80	2250	100
150	165.2	5.0	8.0	400	±100	1600	140	2150	170
200	216.3	5.8	10.0	460	±100	1650	200	2200	245
250	267.4	6.6	8.0	510	±100	1700	240	2250	285
300	318.5	6.9	6.0	545	±100	1700	250	2250	280
350	355.6	7.9	6.0	595	±100	1700	300	2300	340
400	406.4	7.9	6.0	645	±100	1700	335	2300	385
450	457.2	7.9	6.0	695	±100	1700	375	2300	430
500	508.0	6.0	6.0	745	±100	1700	385	2300	440
600	609.6	6.0	6.0	865	±100	1750	510	2350	585
700	711.2	6.0	6.0	975	±100	1800	630	2400	715
800	812.8	8.0	8.0	1085	±100	1850	900	2450	1030
900	914.4	8.0	8.0	1205	±100	1900	1120	2450	1250
1000	1016.0	9.0	9.0	1315	±100	2000	1400	2550	1570
1100	1117.6	12.0	9.0	1430	±100	2050	1810	2550	1980
1200	1219.2	12.0	10.0	1535	±100	2150	2100	2650	2350
1350	1371.6	12.0	10.0	1695	±100	2150	2500	2650	2700
1500	1524.0	14.0	10.0	1850	±100	2200	3000	2700	3300
1650	1682.0	16.0	12.0	2050	±100	2450	4200	2800	4500
1800	1832.0	16.0	12.0	2230	±100	2500	4900	2800	5200
2000	2038.0	19.0	16.0	2470	±100	2550	6200	2850	6700
2100	2138.0	19.0	16.0	2570	±100	2550	6600	2850	7100
2200	2238.0	19.0	16.0	2675	±100	2600	7000	2950	7600
2300	2344.0	22.0	19.0	2790	±100	2650	8300	2950	8900
2400	2444.0	22.0	19.0	2890	±100	2700	8700	3000	9400

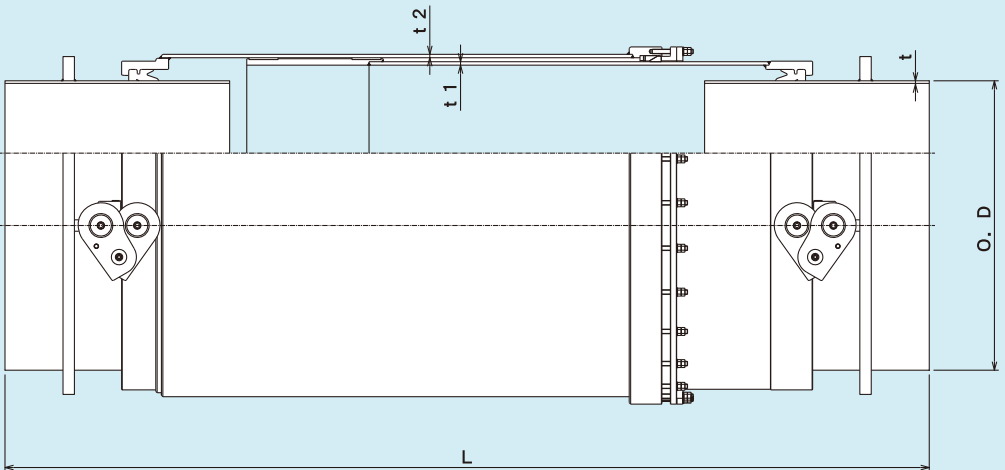
※Both bevels (compatible with joint coating)

Notes: We can adjust length (L) and lateral displacement. Please share us spec.
This is the inter-surface length (L) that is compatible with the coating for welded parts (joint coating).
We can design and produce joints not tabulated above. Please contact us.
We can also design and produce joints with an lateral displacement of 300 mm or over.

Σ2-EX model

Normal pressure: 1.0 MPa
Test pressure: 1.5 MPa

Great Expansion



Nominal diameter	Spigot pipe		Sleeve	Expansion and Contraction			Lateral displacement			
	O.D	t	t1 (t2)	Contraction amount (normal condition)	Expansion amount (normal condition)	Extension amount (maximum)	200 mm lateral displacement type		300 mm lateral displacement type	
							L	Weight [kg]	L	Weight [kg]
300	318.5	6.9	7.9 (8)	200	200	1000	2550	435	2700	450
350	355.6	7.9	9.0	200	200	1000	2600	570	2750	590
400	406.4	7.9	9.0	200	200	1000	2650	640	2800	660
450	457.2	7.9	9.0	200	200	1000	2700	715	2850	735
500	508.0	6.0	9.0	200	200	1000	2750	760	2900	790
600	609.6	6.0	9.0	200	200	1000	2800	960	3000	1000
700	711.2	6.0	9.0	200	200	1000	2900	1120	3050	1160
800	812.8	8.0	9.0	200	200	1000	2950	1470	3050	1500
900	914.4	8.0	9.0	200	200	1000	3050	1670	3150	1700
1000	1016.0	9.0	12.0	200	200	1000	3150	2350	3250	2400
1100	1117.6	12.0	14.0	200	200	1000	3200	2900	3350	3000
1200	1219.2	12.0	14.0	200	200	1000	3300	3200	3400	3300
1350	1371.6	12.0	14.0	200	200	1000	3450	4200	3600	4300
1500	1524.0	14.0	16.0	200	200	1000	3550	5200	3700	5300
1650	1682.0	16.0	19.0	200	200	1000	3750	7900	3900	8100
1800	1832.0	16.0	19.0	200	200	1000	3850	8800	4000	9100
2000	2038.0	19.0	22.0	200	200	1000	3950	11100	4150	11500
2100	2138.0	19.0	22.0	200	200	1000	4050	12000	4250	12400
2200	2238.0	19.0	22.0	200	200	1000	4100	12700	4300	13200
2300	2344.0	22.0	25.0	200	200	1000	4150	14900	4350	15400
2400	2444.0	22.0	25.0	200	200	1000	4200	15700	4400	16300

※Both bevels (compatible with joint coating)

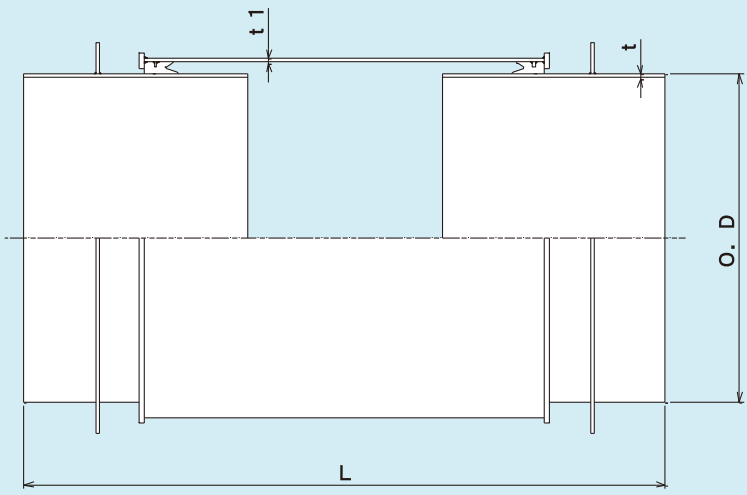
Notes: We can adjust length (L) and lateral displacement. Please share us spec.
This is the inter-surface length (L) that is compatible with the coating for welded parts (joint coating).
We can design and produce joints not tabulated above. Please contact us.
We can also design and produce joints with an lateral displacement of 300 mm or over.
© We can also produce joints with a cover for preventing detachment according to places and conditions of use.

Dimensions and performance

Σ 2-A model for high pressures

Normal pressure: 2.0 MPa
Test pressure: 3.0 MPa

High Pressure Type



Nominal diameter	Spigot pipe		Sleeve	Expansion and Contraction		Lateral displacement			
	O.D	t	t1			100 mm lateral displacement type		200 mm lateral displacement type	
						L	Weight [kg]	L	Weight [kg]
80	89.1	4.5	5.1	+ 85	- 90	1550	40	2550	60
100	114.3	4.5	5.5	+ 90	- 90	1550	55	2550	80
150	165.2	5.5	6.4	+100	- 90	1550	110	2550	160
200	216.3	6.4	6.4	+115	- 80	1600	150	2600	210
250	267.4	6.4	7.9	+115	- 80	1600	170	2600	250
300	318.5	6.4	7.9	+115	- 80	1600	210	2600	290
350	355.6	7.9	6	+125	-100	1650	180	2650	250
400	406.4	7.9	6	+130	-100	1650	210	2650	280
450	457.2	6.4	6	+140	-100	1650	210	2650	300
500	508	6.4	6	+140	-100	1700	240	2700	330
600	609.6	7.9	8	+150	-100	1750	380	2750	530
700	711.2	8	8	+155	-100	1800	470	2800	640
800	812.8	9	9	+165	-100	1800	590	2800	810
900	914.4	9	9	+175	-100	1800	680	2800	920
1000	1016	12	12	+150	-100	1900	1070	2900	1430

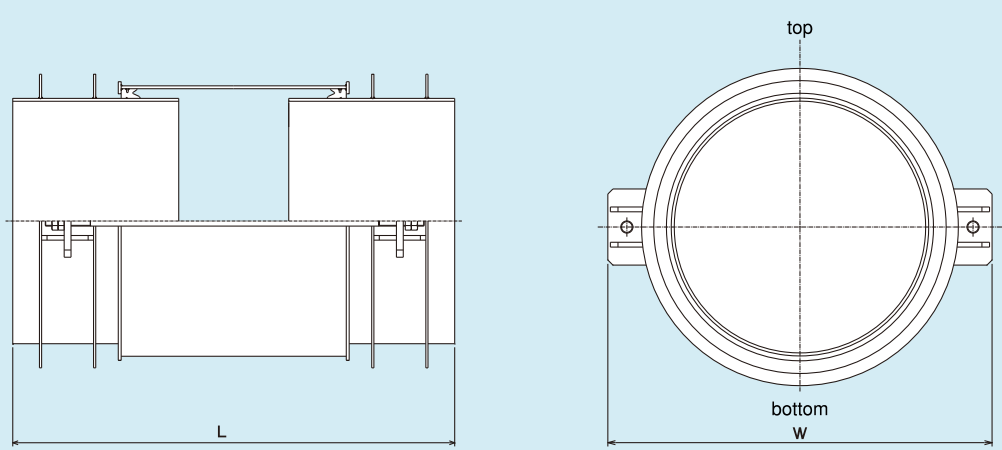
※Both bevels (compatible with joint coating)

Notes: We can adjust length (L) and lateral displacement. Please share us spec.
This is the inter-surface length (L) that is compatible with the coating for welded parts (joint coating).
We can design and produce joints not tabulated above. Please contact us.
We can also design and produce joints with an lateral displacement of 300 mm or over.

Σ 2-A model with high-pressure tie-rods

Normal pressure: 2.0 MPa
Test pressure: 3.0 MPa

High Pressure Type
With Tie-rods



※Joints with tie-rods has no expansion ability.

Nominal diameter	100 mm lateral displacement type		200 mm lateral displacement type	
	2.0MPa		2.0MPa	
	L	W	L	W
80	1650	230	2650	230
100	1650	260	2650	260
150	1750	380	2750	380
200	1800	430	2800	430
250	1850	480	2850	480
300	1850	540	2850	540
350	1950	590	2950	590
400	2000	680	3000	680
450	2000	750	3000	750
500	2150	830	3150	830
600	2300	950	3300	950
700	2450	1110	3450	1110
800	2550	1270	3550	1270
900	2550	1400	3550	1400
1000	2750	1600	3750	1600

※Both bevels (compatible with joint coating)

Notes: We can adjust length (L) and lateral displacement. Please share us spec.
This is the inter-surface length (L) that is compatible with the coating for welded parts (joint coating).
We can design and produce joints not tabulated above. Please contact us.
We can also design and produce joints with an lateral displacement of 300 mm or over.

Dimensions and performance

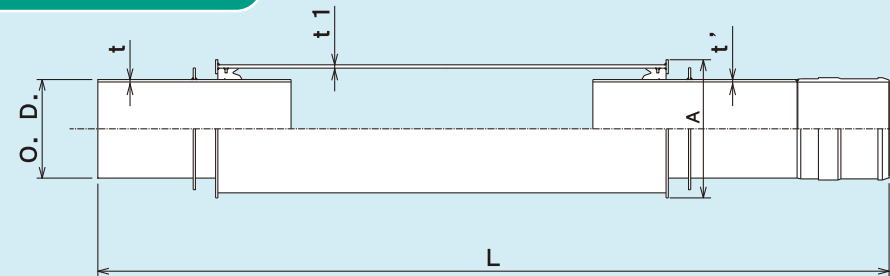
Reference material regarding the insulation type

Σ2-A model, insulation type

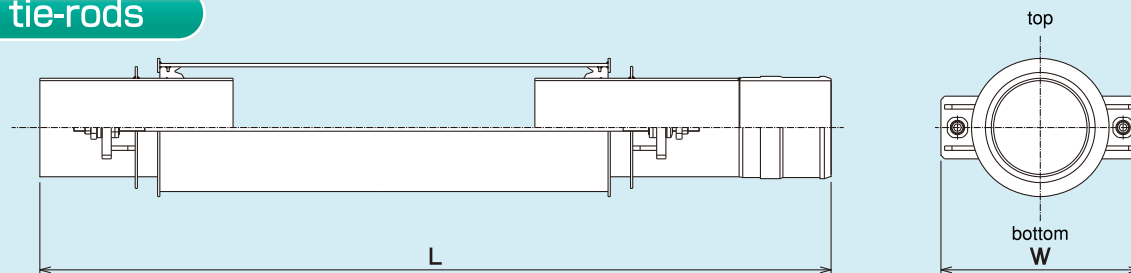
Normal pressure: 1.0 MPa
Test pressure: 1.5 MPa

Insulation Type

Without tie-rods



With tie-rods



Without tie-rods

Nominal diameter	Spigot pipe			Sleeve		Expansion and Contraction		Lateral displacement			
	O.D	t	t'	A	t1			100 mm lateral displacement type		200 mm lateral displacement type	
								L	Weight [kg]	L	Weight [kg]
80	89.1	4	4.5	152.4	6	+ 85	- 90	1200	36	1800	50
100	114.3	4	4.9	177.8	6	+ 90	- 90	1200	45	1800	62
150	165.2	5	5.5	241.8	8	+ 100	- 90	1250	79	1850	110
200	216.3	6.5	6.4	317	10	+ 115	- 80	1250	105	1850	150
250	267.4	6.5	6.4	375	9	+ 115	- 80	1250	115	1850	160
300	318.5	6.5	6.4	414	6	+ 115	- 80	1300	125	1900	160
350	355.6	8	7.9	454	6	+ 125	- 100	1350	180	1950	225

Pipe edge shape: One-sided groove NS-shaped insertion opening (compatible with joint coating)
In the case of the connection with a coupling ring, the length L varies. Please contact us.

With tie-rods

Nominal diameter	100 mm lateral displacement type						200 mm lateral displacement type					
	0.75MPa			1.0MPa			0.75MPa			1.0MPa		
	L	Weight [kg]	W	L	Weight [kg]	W	L	Weight [kg]	W	L	Weight [kg]	W
80	1300	54	330	1300	54	330	1900	70	330	1900	70	330
100	1300	65	350	1300	65	350	1900	84	350	1900	84	350
150	1300	105	400	1300	105	400	1900	135	400	1900	135	400
200	1500	160	490	1500	160	490	2100	210	490	2100	210	490
250	1500	165	540	1500	170	547.4	2100	220	540	2100	225	547.4
300	1550	175	588.5	1550	180	598.5	2150	220	588.5	2150	225	598.5
350	1600	235	645.6	1600	235	645.6	2200	285	645.6	2200	285	645.6

Notes: We can adjust length (L) and lateral displacement. Please share us spec.
This is the inter-surface length (L) that is compatible with the coating for welded parts (joint coating).
We can design and produce joints not tabulated above. Please contact us.
We can also design and produce joints with an lateral displacement of 300 mm or over.

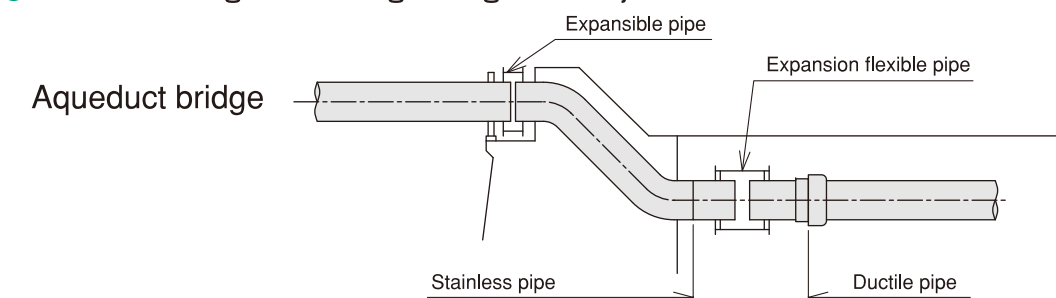
Features

The specs for pipe edges are stainless groove in welding mechanical insertion opening. This is used for connecting a stainless pipe and a ductile pipe. Since the slidable part is mounted with insulated rubber lining, this type is suited for the use at a place where the corrosion through the contact with different metal may occur.

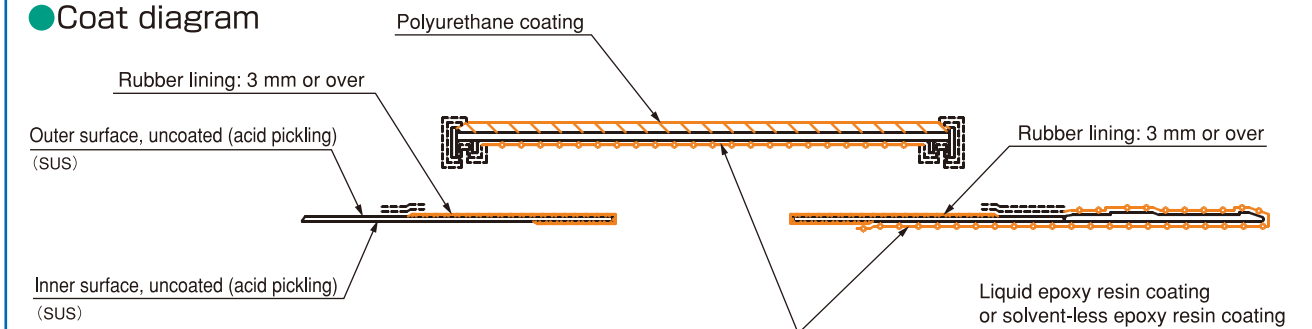
Examples of usage: The buried part of a water pipe bridge where stainless pipes are used for exposed areas and ductile pipes are used for buried areas.
Around the building frames of facilities, such as water purification plants, where stainless pipes are used inside the facilities and ductile pipes are used outside them.

- Insulation property that exceeds the reference value (1 MΩ or over) of "Guidelines for Preventing Macrocell Corrosion" of WSP. (verified)
- Since it is unnecessary to use insulation flanges as a measure about the insulation due to the corrosion through the contact with different metal at the buried part, our products are free from strength deterioration and clearance corrosion due to shear, bending, vibration, etc.

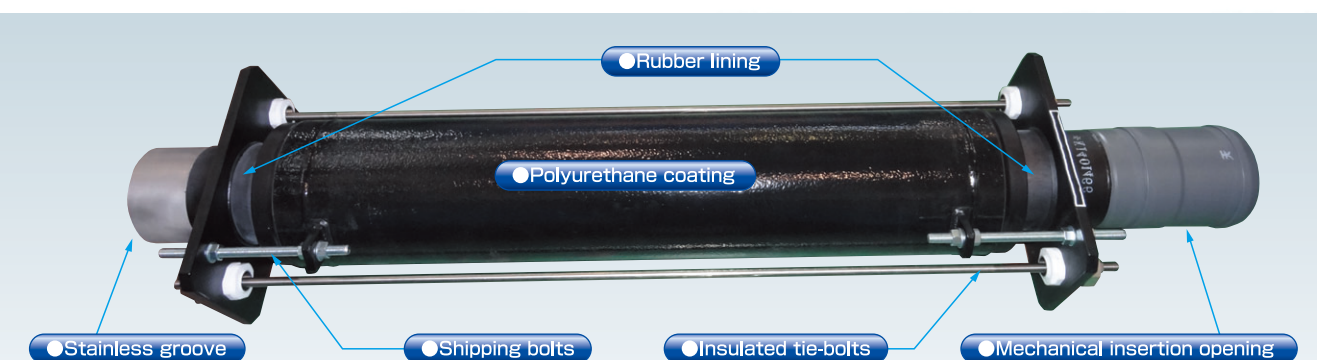
● Schematic diagram of usage: Diagram of a joint between SUS and DIP



● Coat diagram



●● Photo of the insulation type



Joint function test

This test is conducted for checking whether the pressure resistance and displacement functions of Closer Joint $\Sigma 2$ Model work against the expansion and contraction due to temperature differences, uneven ground subsidence, etc.

Tested items

Quake-absorbing and quake-resistant expansion flexible pipe to be buried
Closer Joint $\Sigma 2$ Model 800A 200 mm displacement type; both edges beveled

Performance test



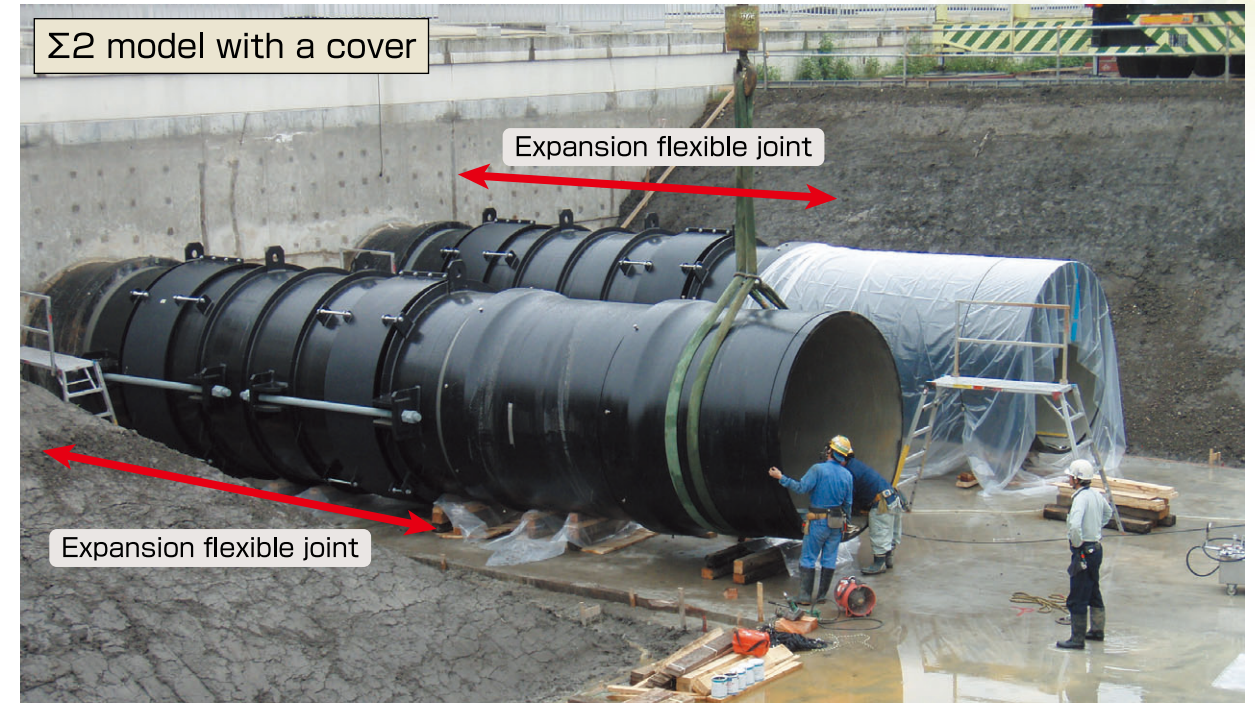
Pressure resistance test

1. Testing method: A product is set at testing equipment, testing pressure is applied for five minutes, and it is checked whether there are any abnormalities.
2. Test results: There are no abnormalities, such as water leakage.

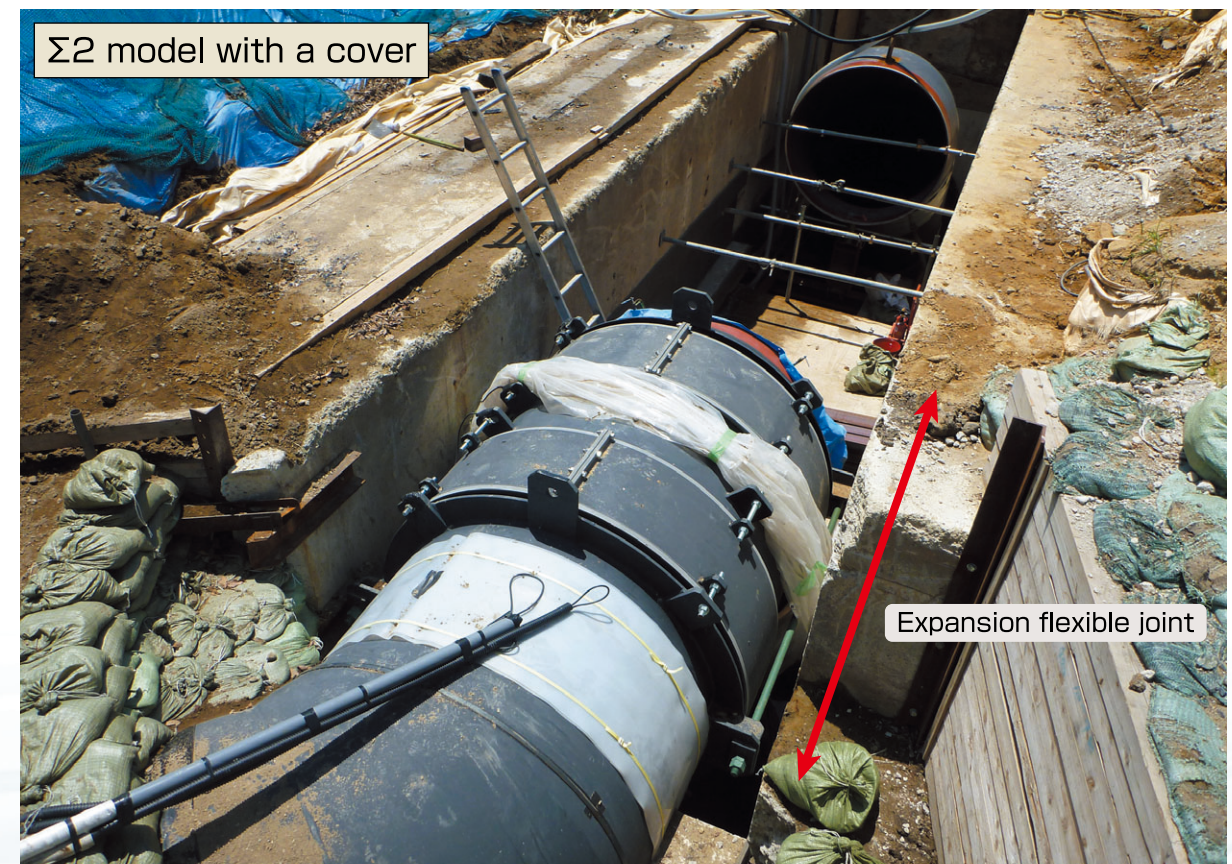
Eccentricity tests

1. Testing method: A product is set at testing equipment, displacement of up to 200 mm is induced, testing pressure is applied for five minutes, and it is checked whether there are any abnormalities.
2. Test results: There are no abnormalities, such as water leakage.

Example of installation



Water purification facility in Saitama Prefecture



Water purification facility in Chiba Prefecture

Items of specs at the time of order placement

1	Purpose of use
2	Model: standard type, with tie-bolts, with a cover, EX type, insulation type
3	Quantity
4	Deadline
5	Place of delivery
6	Outer and inner diameters, wall thickness of a pipe
7	Pipe material
8	Fluid type
9	Used pressure (normal pressure)
10	Testing pressure
11	Necessary performance
	●Expansion and contraction amounts
	●Lateral displacement amount (difference in subsidence)
12	Pipe connection method
	●Flange shape (flange type)
	●Welding type (groove shape)
	●Mechanical coupling (socket and insertion opening)
	●Others
13	Conditions for exposed or buried pipes
	●Case of buried pipes: earth covering [m]
	●Wheel load (T)
	●Others
14	Installation conditions (horizontal piping, vertical piping, and inclined piping)
15	Coating type
	Inner surface
	Outer surface
	Others If Any

Notes: We will design and produce products more economically and effectively according to your requests and usage conditions. Please feel free to ask us.

Notes