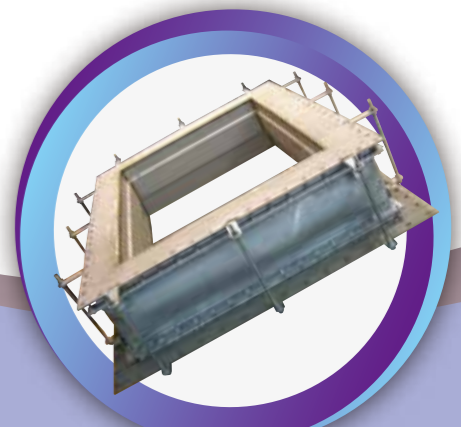
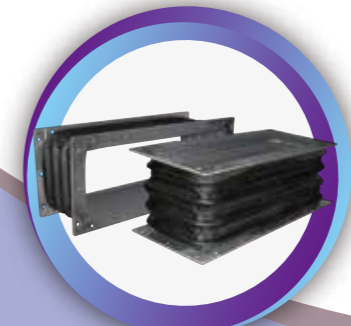




DAIDOH 大同特殊工業株式会社
DAIDOH TOKUSHU KOGYO CO., LTD.

Expansion Joint & Non-metal Bellows



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The performance described in this catalog is not the specification value. Please conduct a pre-test at your company before using this product to check that the product matches with the purpose of use. Please note that descriptions are subject to change without notice for improving performances and changing specifications.

DAIDOH
大同特殊工業株式会社
DAIDOH TOKUSHU KOGYO CO., LTD.

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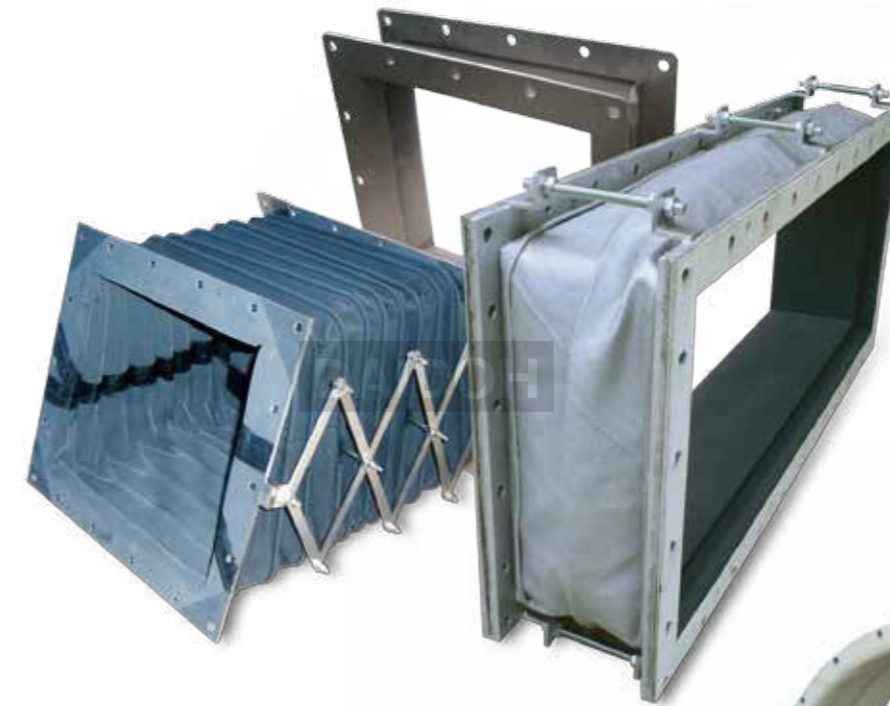
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- 02 DR Ring type expansion joint
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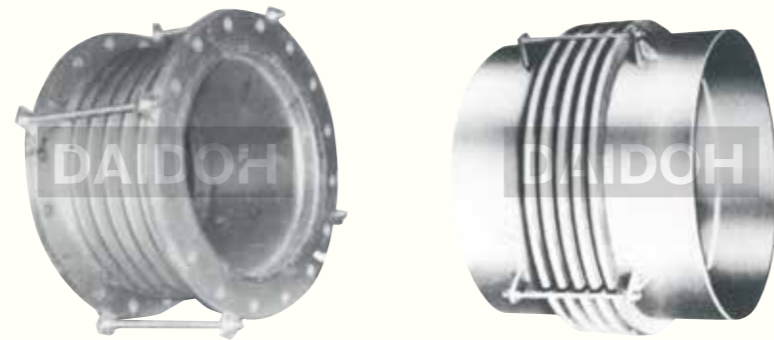
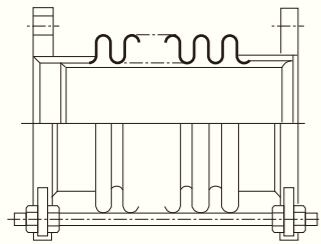
DS-J

Free type expansion joint

Flanges or pipes of various types are welded on both sides of bellows. This product is used for low-pressure pipes. The structure includes a single type and a double type to be used for different purposes.

Application For low pressure

Main Fluid Gas, air, water, etc.

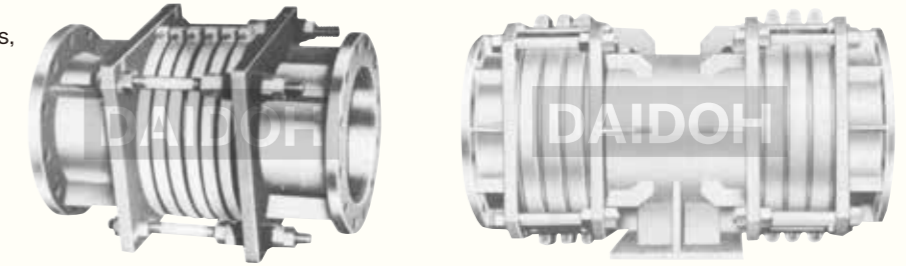
**DR**

Ring type expansion joint

Control rings are attached to the groove of the bellows. The rings provide reinforcement against the internal pressure and unify elasticity at each peak of the bellows to maintain the durability of the expansion joint. The structure includes a single type and double type to be used for different purposes.

Application For high pressure

Main Fluid Steam, oil, chemicals, gas, air, water, etc.



Single type

Double type

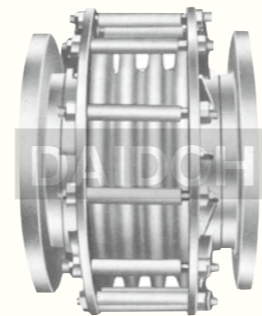
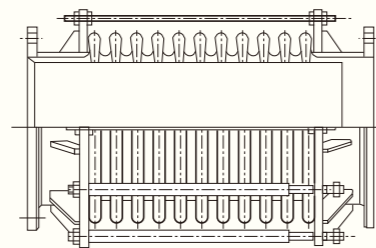
DS-R

Rod type expansion joint

A guide ring, guide rod, and guide stopper are attached to the free type to enable the adjustment of the amount of elasticity. This type is used in a pipeline with relatively mid-level pressure. When you want to use a joint for a large amount of elasticity, please apply the double type joint. The structure includes a single type and double type to be used for different purposes.

Application For low & middle pressure

Main Fluid Steam, oil, chemicals, gas, air, water, etc.

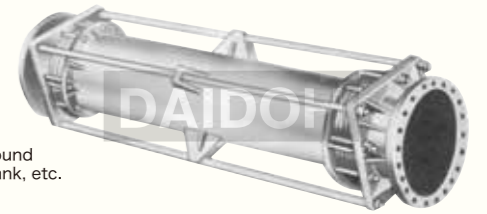
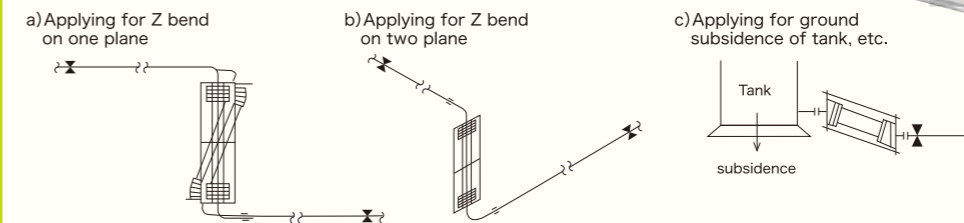
**DU**

Universal type expansion joint

The universal type is designed mainly to absorb lateral deflection. The amount of lateral deflection is determined based on the combination of the angular rotation of the two bellows and the length of the intermediate pipe. The tie rod is designed to create smooth movement of the intermediate pipe and produce even movement of the two bellows.

Application For middle & high pressure

Main Fluid Steam, oil, chemicals, gas, air, etc.

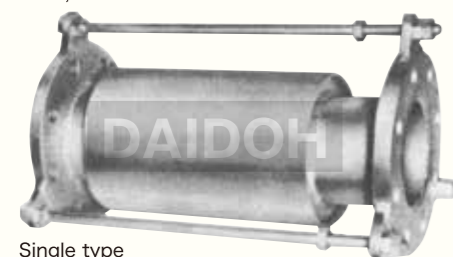
**DS-G**

External sleeve type expansion joint

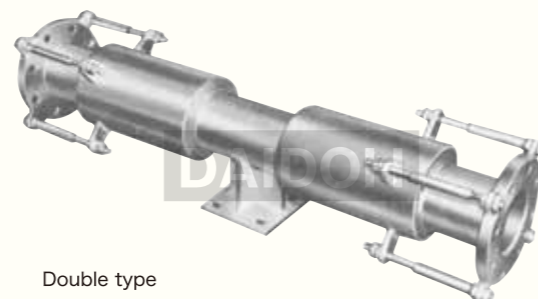
A protective external sleeve is attached to the outside of bellows. The adjustment ring attached to the joint allows smooth movement along the shaft core during expansion and contraction. Also, the external sleeve controls the movement so that the pressure will not cause buckling of the bellows. These mechanisms ensure safety. The structure includes a single type and double type to be used for different purposes.

Application For low & middle pressure

Main Fluid Steam, oil, chemicals, gas, air, water, etc.



Single type



Double type

DZ-H

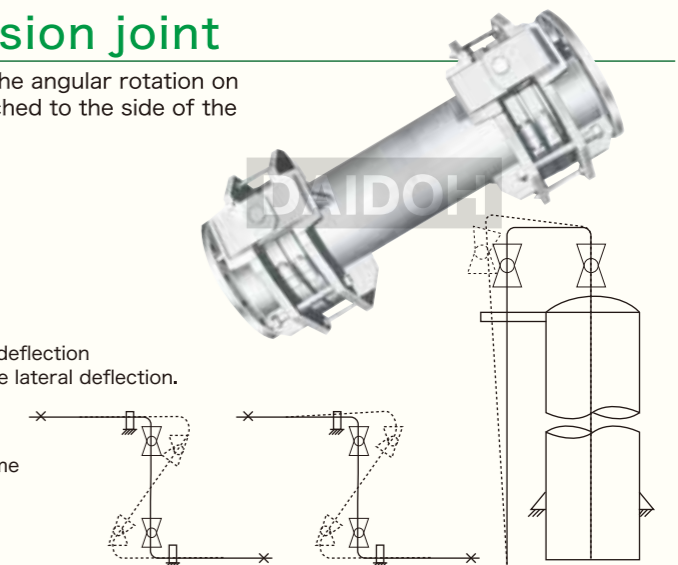
Hinge type expansion joint

The hinge type is designed to absorb the angular rotation on one plane. The hinge arm and pin attached to the side of the bellows restrict the plane thrust.

Application For middle & high pressure

Main Fluid Steam, oil, chemicals, gas, air, etc.

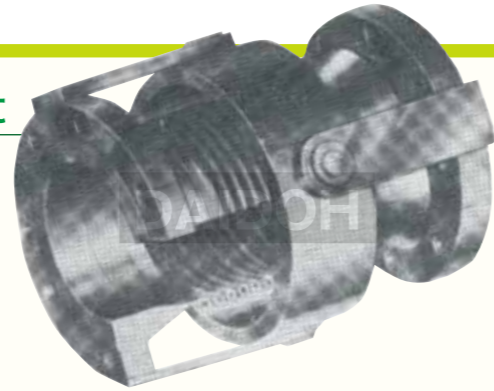
1. The longer the intermediate pipe, the more it absorbs lateral deflection (for double type) because the bending movement absorbs the lateral deflection.
2. No load is applied to a fixed point because the plane thrust is restricted by the hinge pin.
3. Deflections in two directions can be absorbed at the same time (when three units of the single type are used).



DZ-J

Gimbal type expansion joint

The gimbal type has a structure in which two hinge arms are combined by rotating them 90 degrees.

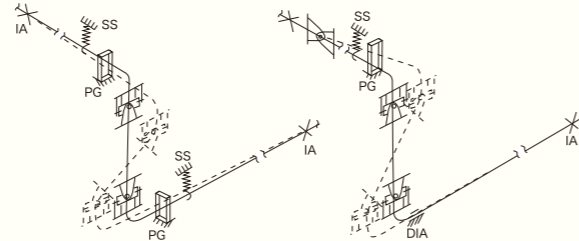


Application For middle & high pressure

Main Fluid Steam, oil, chemicals, gas, air, etc.

Characteristics of gimbal type expansion joint

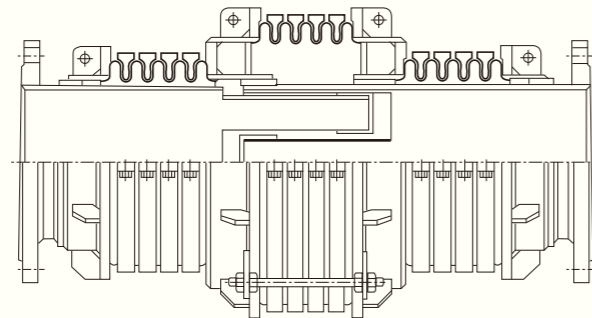
1. The use of the gimbal type for a complicated pipe line like the one in the diagram and combined use with the hinge type are effective.
2. This product can absorb deflection in different directions (for the double type).
3. Load is not applied to a fixed point because the gimbal pin restricts the plane thrust generated by the internal pressure.



DZ-S

Straight pipe pressure balance type expansion joint

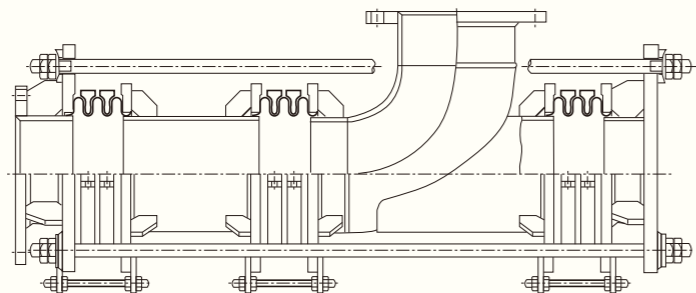
The plane thrusts of both side two bellows are offset each other because they are transferred to the center bellows by outer & inner sleeves or tie rod. Thus only the spring reactive force of the bellows is applied to a fixed point. This product is used in areas where the installation of a fixed point is difficult.



DZ-K

Curved pipe pressure balance type expansion joint

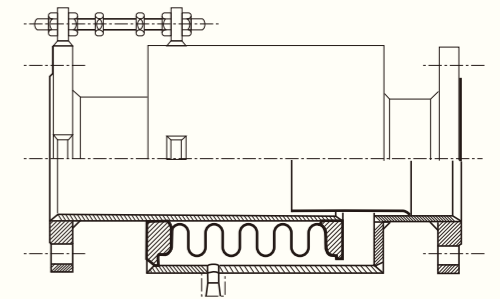
This is a curved expansion joint installed at the corner of a pipe layout. The plane thrust is fixed with a tie rod bolt. Thus, only the spring reactive force of the bellows is applied to the fixed point of a pipe layout. This product is used in areas where the installation of a fixed point is difficult.



DZ-G

External pressure type expansion joint

This product is structured so that fluid pressure is applied to the outside of the bellows. Fluid does not accumulate on the bellows, and a drain can be attached to the external cylinder.



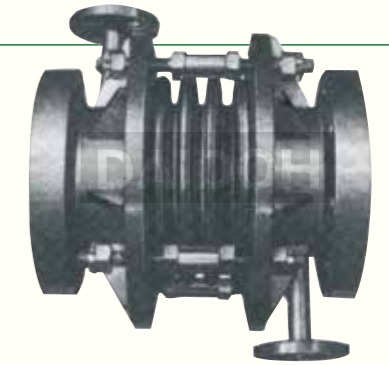
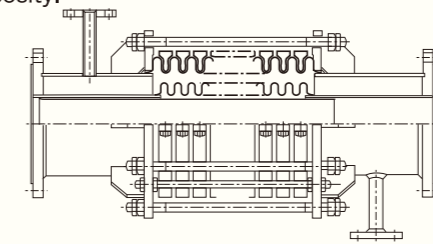
Application For low pressure

Main Fluid Steam, oil, chemicals, gas, air, water, etc.

DZ-W

Jacket type expansion joint

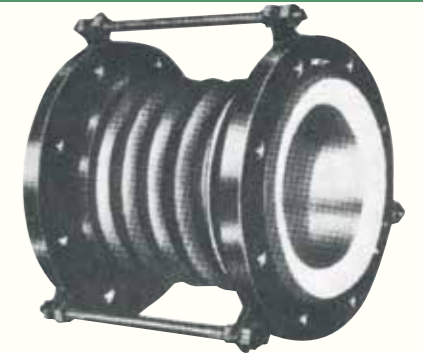
A structure with a jacket pipe is used because the fluid flow needs to be improved when using highly viscous fluid by somehow increasing the temperature and lowering the viscosity.



DS-T

Internal Teflon® type expansion joint

This product has Teflon® on the inside of the expansion metal pipe joint to increase the anti-corrosion property against corrosive fluids. Two types of interior structure are available: one with Teflon® lining on the expansion metal pipe joint, and the other with Teflon® coating. These two types of treatment method can be selected for different purposes.

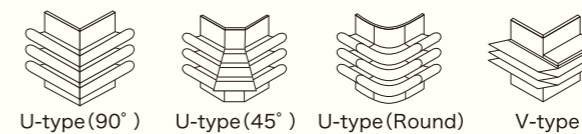


DL

Square bellows type expansion joint

Square bellows type expansion joint is often used for those pipe lines such as exhaust gas of boiler, turbine engine, or blower installation. We have two kinds of joints; one is Angular Flange type and the other is Welding type (bevel end). For joints with especially large diameter, worksite assembly type is also available by supplying the parts separately.

bellows type



TMN-5000

Non-welding expansion joint

- Structure**
- The structure in which the bellows is embedded without welding
 - Stainless steel is used in the fluid contact portions.

- Application**
- Used for absorbing vibration, exhaust pipes, and various types of low-pressure pipes

- Feature**
- Suitable for pipe layouts of low-pressure exhaust gases and air. (Internal gasket (O-ring) is necessary if airtightness is required.)
 - Products without the internal cylinder can also be produced.

No.	Name	Material
1	Bellows	SUS304·SUS316·SUS316L others
2	Flange	SS400·SUS304·SUS316·SUS316L
3	Inner sleeve	SUS304·SUS316·SUS316L others
4	Mounting bracket	SS400·SUS304
5	Set bolt · nut	SS400·SUS304

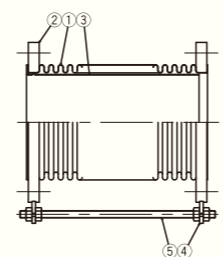
Various flanges such as JIS2K, JIS5K, JIS10K, JISF8705, etc. can be attached
 ● Available NB : 20A~1500A

For low pressure (Other than standard face to face distance are also available. Please contact us for detail)

NB.	Standard face to face(mm)	NB.	Standard face to face(mm)	NB.	Standard face to face(mm)
20A	150	350A	300	950A	350
32A	150	400A	300	1000A	350
40A	150	450A	300	1050A	350
50A	150	500A	300	1100A	350
65A	150	550A	300	1150A	350
80A	150	600A	300	1200A	350
100A	200	650A	300	1250A	350
125A	200	700A	300	1300A	350
150A	200	750A	300	1350A	350
200A	200	800A	300	1400A	350
250A	200	850A	300	1450A	350
300A	200	900A	300	1500A	350



(Shape of inner sleeve will change depending on sizes)



TMN-1000 (10K)

Non-welding anti-vibration joint For 10K/20K

- Structure**
- The structure in which the bellows is embedded without welding
 - Stainless steel is used in the fluid contact portions.

- Application**
- Used for absorbing vibration, exhaust pipes, and various types of low-pressure pipes

- Feature**
- The double-layer bellows structure provides excellent vibration absorption and pressure resistance.

No.	Name	Material
1	Internal bellows	SUS316L
2	Outer bellows	SUS304
3	Flange	SS400·SUS304 others
4	Tie-rod bolt	SS400·SUS304 others
5	Shock absorber	Urethane, etc.
6	Base metal	SPCC·SUS304
7	Mounting bracket	SS400·SUS304
8	Adjustment nut	SS400·SUS304

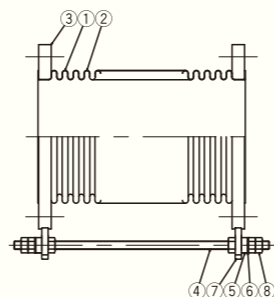
● Available NB : 50A~300A (32A, 40A) (350A~500A)

Standard face to face distance for 10K and distances that can be produced

NB.	Standard face to face(mm)	Producible face to face(mm)
50A	150	100~200
65A	150	100~200
80A	150	100~200
100A	150	100~300
125A	150	100~300
150A	150	100~300
200A	200	100~400
250A	200	100~400
300A	200	100~400

Standard face to face distance for 20K and distances that can be produced

NB.	Standard face to face(mm)	Producible face to face(mm)
50A	110	100~200
65A	110	100~200
80A	110	100~200
100A	150	100~300
125A	150	100~300
150A	150	100~300
200A	200	100~400
250A	200	100~400
300A	200	100~400



Operation manual for Expansion Joint and Vibration-proof Joint

1. This document is described general attention matters about conveyance, installation and maintenance of "Expansion joint".

- Warning** The meaning of this mark is the contents supposing man dying or becoming serious injury.
- Attention** The meaning of this mark is the contents supposing material damage, or man is injured. But it may be connected with a serious result depending on a situation.
- The meaning of this mark is "Prohibition".
- The meaning of this mark is "Compulsion".

2. The main portion of expansion joint is "Bellows" made from thin thickness stainless steel (or corrosion-resistant alloy, heat-resistant alloy). If bellows is damaged or corroded, durability of expansion joint will decline. Therefore, it is necessary to pay sufficient attention for prevention of the following matters with a possibility of reducing the quality of the expansion joint.

- ① Shock, drop
- ② Over displacement
- ③ Welding and cutting work near the expansion joint
- ④ Invasion of salt, sand and iron powder

3. Conveyance
 Keep the following matters at conveyance.

- ① Convey horizontally as much as possible.
- ② Avoid the drag, drop and crash.
- ③ When hanging up the joint, use the cloth belts so that the wire does not contact the bellows directly. Do not hang up the expansion joint to hook the set-bolts or tie-rods. (There is a possibility that the set-bolts or tie-rods may be fallen off or changed the form.)

4. Storage
 Store the expansion joint in the state of the following.

- ① On the flat place at ventilative place.
- ② Do not put the expansion joint on floor directly. Be sure to use a tie.
- ③ Wrap the opening parts of expansion joint by polyethylene sheets not to mix dust.
- ④ Take care not to attach the corrosive matters. (Stainless steel is superior to corrosive proof but take care not to attach the chloride because it is possible to corrode stainless steel by chloride existence.)
- ⑤ The place where the expansion joint does not touch the copper products or copper alloy products.
- ⑥ The place where there is no operation of welding, gouging and gas cutting near the joint.
- ⑦ In case of bellows with control ring, if a dust gets in between control ring and bellows, it might prevent normal compression. Wrap the outer surface of bellows to prevent mixing dust. (Refer to Fig.1)

If a dust gets in between control ring and bellows, bellows does not be compressed.

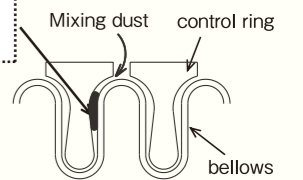
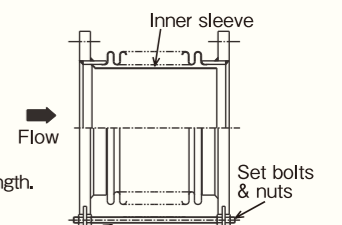


Fig1. control ring and bellows

5. Installation
 At installation, take care of the following matters.

- ① Check the installation place by name plate or tag plate indicated the machinery number or size.
- ② Compare the fitting form and dimensions with drawing.
- ③ In case of expansion joint with inner sleeve, the direction of a flow of fluid is decided. Install according to the direction of flow given in the drawing (Refer to Fig.2).
- ④ Do not loosen the set-bolts until completing installation, because set-bolts are object for fixing overall length. After installation be sure to remove the set-bolts (Refer to Fig.2).
- ⑤ Nut of the tie-rods are already adjusted at the time of delivery. Do not loosen nuts of the tie-rods. (Given the drawing)
- ⑥ Don't install the tube with displacement beyond design value and don't twist.



Remove these bolts & nuts after installation

Fig.2. Expansion joint form figure (example)

6. After installation
 Carry out the following matters not to damage and deteriorate the installed the expansion joint.

- ① Cover the tube with waterproof clothes and prevent to stick the iron powder, sand, dust and water.
- ② Attach the plate indicated to prohibit following matters.
 - A. Welding or weld cutting near and upper the tube.
 - B. Put the heavy things on the expansion joint.
 - C. Work to give a shock.
- ③ At welding or weld cutting upper the tube, be sure to cover the tube with nonflammable clothes.

7. Inspection of pressure proof test of piping line.

- Check the following matters during and immediately after system pressure test.
 - ① Leakage of fluid
 - ② Abnormal transformation
 - ③ Other abnormal condition

8. Check of the expansion joint at test working of piping line.

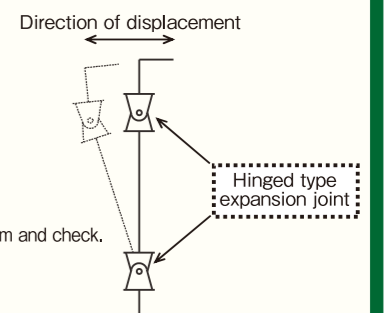
- Judge the following matters at test working.
 - ① Vibration
 - ② Displacement
 - ③ Rust
 - ④ Abnormal transformation, leakage

9. Regular inspection during using period.

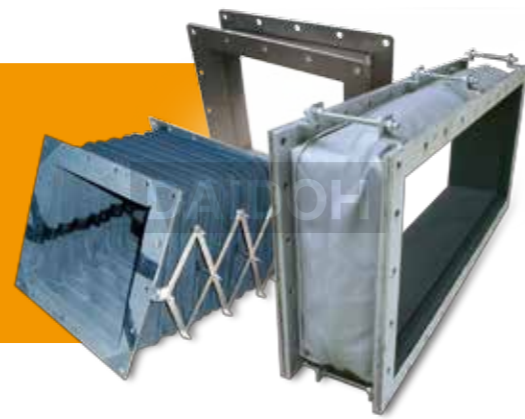
- Check the following matters at regular inspection.
 - Determine the frequency of inspection according to external environment or inner fluid on operation. Clean and exchange old for new to prevent damage accident if needed.
 - ① Rust or corrosive condition on outer surface.
 - ② Corrosive condition of inner surface of expansion joint.※ Remove the expansion joint from piping system and check.
 - ③ External damage and abnormal transformation
 - ④ Trace of leakage (Be careful of a penetration of the fluid from flange gasket faces.)
 - ⑤ Looseness of bolts.

10. Attention items of hinged expansion joint

- ① Hinged arms are attached in both sides of bellows of hinged expansion joint. Install the hinged expansion joint so that hinged arms and flow of displacement become parallel.



Non-metal Bellows DC Series



Features of non-metal bellows, DC series

1. The main body is made of flexible materials with great expansion and contraction properties that effectively absorb displacement.
2. The reactive force is lower than metal expansion joints, which means excellent vibration absorption and good flexibility.
3. Use of PTFE (Teflon) film provides protection from corrosive gas and ensures higher level of air-tightness.
4. Products with various shapes (round, square, tapered shape with varying diameter) and large diameter can also be produced.
5. Bodies with suitable materials for purposes can be produced (temperature, pressure, fluid, etc.)



Main purposes

For pipes	Absorption of equipments vibrations, such as pipe fans, absorption of expansion and contraction caused by thermal displacement, absorption of axial difference
For transportation	Powder and heated fluid transfer lines
For air ducts	Exhaust gas treatment, smoke duct, smoke extraction (desulfurization and denitrification) lines
For dust prevention	Machine tools and cylinder rod cover

Guideline for selecting the body materials

Temperature	Material
100°C or below	Rubber based (CR, IIR, NBR), PVC, Urethane, Polyethylene etc..
120°C or below	Rubber based (EPDM, CSM)
180°C or below	Silicone conex, Silicone glass cloth, Aluminum foil glass cloth, Fluorine rubber cloth etc..
180°C and over	Glass cloth, Silicone glass cloth, Aluminum foil glass cloth Ceramics, Kevlar combined Ceramics etc.. (For high temperature, use insulator together)

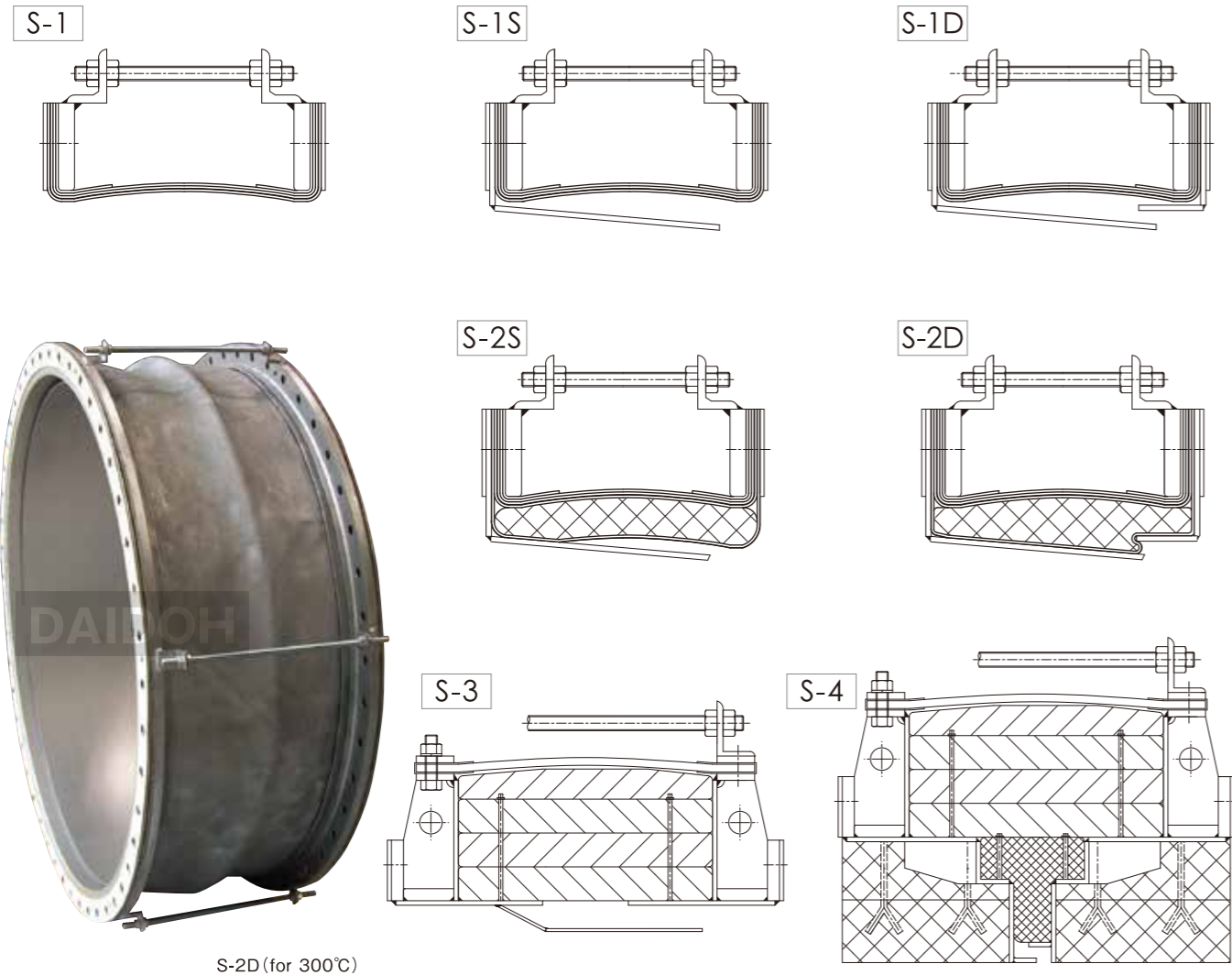
Features of different materials

Material	Feature
CR(Chloroprene rubber)	<ul style="list-style-type: none"> Excellent ozone resistance and thermal degradation resistance Mid-level oil resistance and chemical resistance and good flame retardancy General-purpose material (normal temp: 100°C or below)
IIR(Butyl rubber)	<ul style="list-style-type: none"> Excellent air-tightness and excellent weather, acid, and alkaline resistances Small repulsion resilience and quick vibration damping (normal temp: 100°C or below)
NBR(Nitrile rubber)	<ul style="list-style-type: none"> Excellent oil and gasoline resistance. Good abrasion resistance Poor ozone resistance and weather resistance. (normal temp: 70°C or below)
NR(Natural rubber)	<ul style="list-style-type: none"> Excellent repulsion resilience, abrasion resistance, and mechanical strength Poor oil resistance and weather resistance. (normal temp: 80°C or below)
EPDM(Ethylene polypropylene rubber)	<ul style="list-style-type: none"> Similar to IIR (butyl rubber) but superior (except for air-tightness) Poor oil resistance. (normal temp: 120°C or below)
CSM(Chlorosulfonated polyethylene rubber)	<ul style="list-style-type: none"> Excellent weather, ozone, chemical, and heat resistance Good abrasion resistance. (normal temp: 120°C or below)
FKM(Flourine rubber)	<ul style="list-style-type: none"> Excellent oil, heat, chemical, solvent, ozone, and weather resistance Poor cold and organic acid resistance, and mechanical strength (normal temp: 200°C or below)
VMQ(Silicone rubber)	<ul style="list-style-type: none"> Excellent heat, cold resistance, electric feature, ozone and weather resistance Poor mechanical strength (normal temp: 200°C or below)

Material	Feature
AU(Urethane rubber)	<ul style="list-style-type: none"> Excellent repulsion resilience, abrasion resistance, mechanical strength and oil resistance. Poor chemical resistance and water resistance (normal temp: 60°C or below)
PVC(Poly vinyl chloride)	<ul style="list-style-type: none"> Good water resistance and chemical resistance Flame retardancy and electric insulation Poor heat resistance(Soften at 65°C~80°C)
PE(Polyethylene)	<ul style="list-style-type: none"> Excellent abrasion resistance, shock resistance, electric insulation, chemical resistance, and water resistance Poor heat resistance (normal temp: 80°C or below)
PTFE(TEFLON)	<ul style="list-style-type: none"> Excellent chemical resistance Excellent heat, weather, ozone, and water resistance Good electric insulation Low friction Vulnerable to tearing (normal temp: 230°C or below)
Alamide fiber(CONEX)	<ul style="list-style-type: none"> Excellent heat resistance(Carbonize at 400°C) Excellent flame resistance Less dust is generated compared to other heat resistant materials. Good chemical resistance and mechanical strength (normal temp: 180°C or below)
Alamide fiber(KEVLAR)	<ul style="list-style-type: none"> Ultra high strength and excellent abrasion resistance Excellent heat resistance Poor chemical resistance and ozone resistance (normal temp: 200°C or below)
Glass cloth	<ul style="list-style-type: none"> Inorganic compound Excellent heat resistance and fire proof Good chemical resistance Excellent tensile strength (normal temp: 400°C or below)
Ceramic cloth	<ul style="list-style-type: none"> Excellent heat resistance (600°C and over), and fire proof Good electric insulation

DC-S series

The DC-S series include products with straight structures. Effective for absorbing heat displacement and gaps among devices that occur in various pipes as main purposes



S-2D (for 300°C)

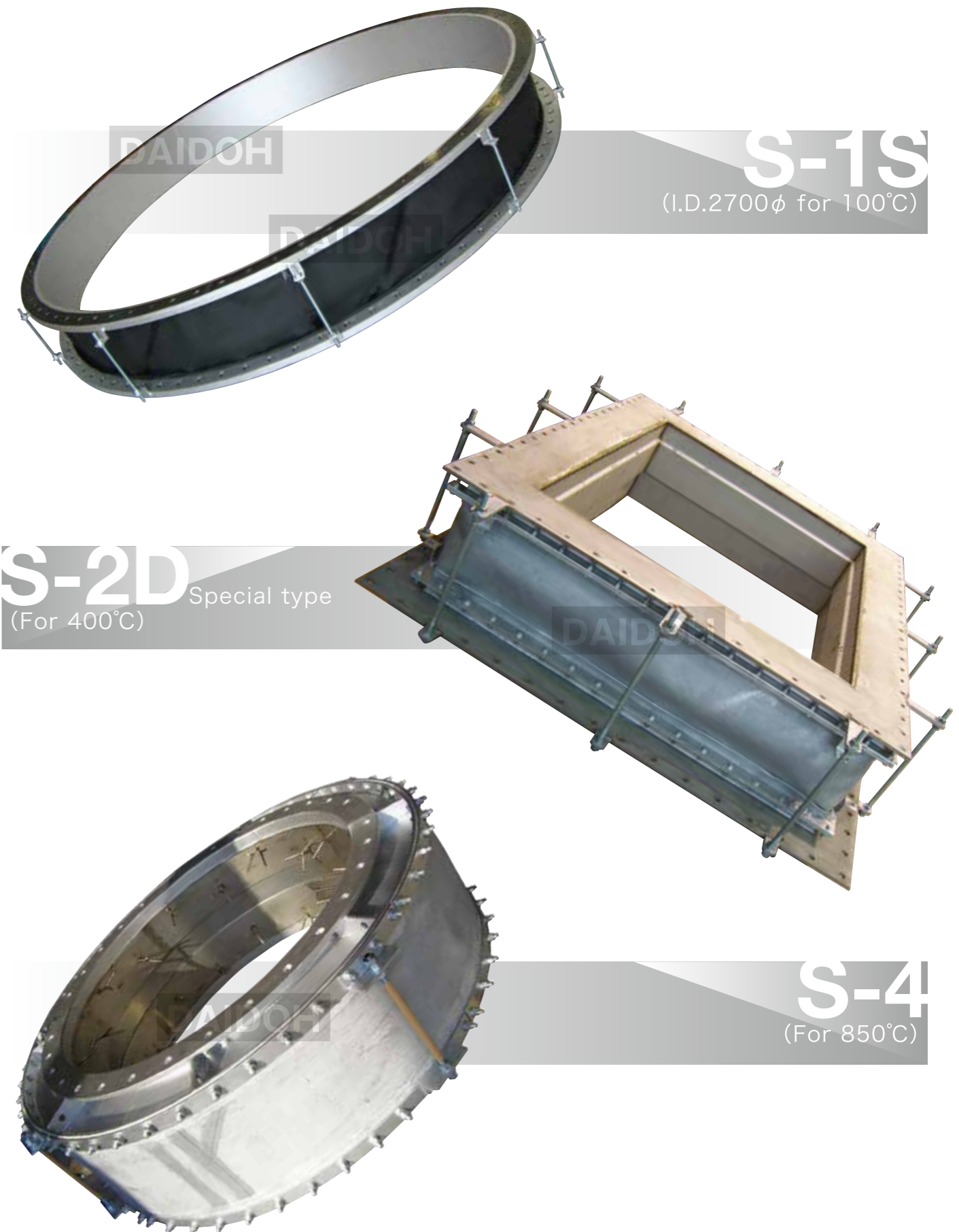
Basic structure of the DC-S series

(We create products for specific operating conditions. We produce products for outside of the design conditions. Please contact us for detail.)

Type	Temperature	Pressure	Flow resistance
S-1	250°C or below	+15000~ 5000mmAq (below 100°C)	25m/s (below 100°C)
		±5000mmAq(100°C and over)	20m/s (100°C and over)
S-1S	250°C or below	±5000mmAq	30m/s
S-1D	250°C or below	±5000mmAq	50m/s
S-2S	400°C or below	±5000mmAq	30m/s
S-2D	400°C or below	±5000mmAq	50m/s
S-3	700°C or below	±5000mmAq	50m/s
S-4	1000°C or below	±5000mmAq	50m/s

CAD drawings are prepared when necessary.

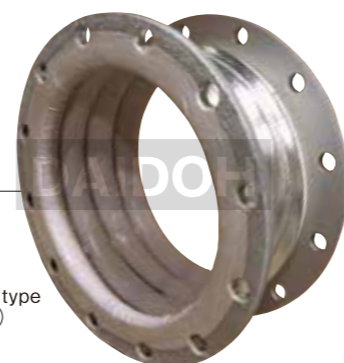
Product introduction





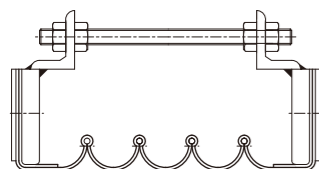
DC-W series

The DC-W series include bellow-shaped products. Mainly effective in areas with large flow rate.

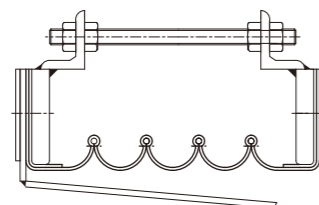


W-2, W-3 compound type
(inner surface: PTFE)

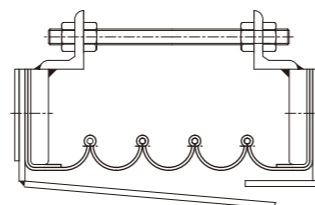
W-1



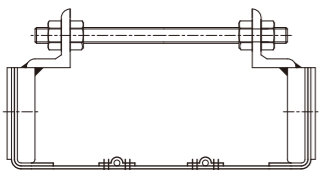
W-1S



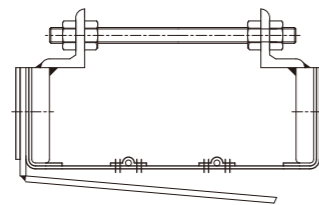
W-1D



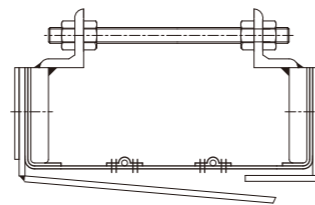
W-2



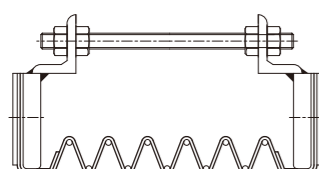
W-2S



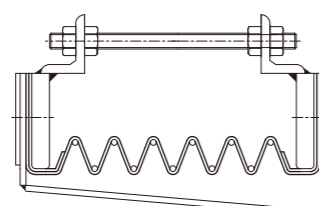
W-2D



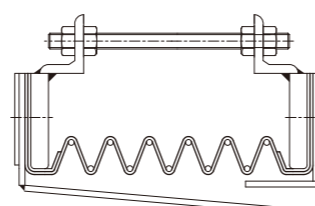
W-3



W-3S



W-3D



Basic structure of the DC-W series

(We create products for specific operating conditions. We produce products for outside of the design conditions. Please contact us for detail.)

Type	Temperature	Pressure	Flow resistance	Main purposes
W-1	250°C or below	±500mmAq	25m/s (below 100°C)	Gas transfer, such as in dryer lines. Powder transfer chute, etc.
			20m/s (100°C and over)	
W-1S	250°C or below	±1000mmAq	30m/s	Effective for areas with relatively low pressure and large displacement
W-1D	250°C or below	±1000mmAq	50m/s	
W-2	250°C or below	±3000mmAq	25m/s (below 100°C)	Suction and discharge of air blowers Absorption of pipe vibration, etc. Effective for areas with relatively large vibration
			20m/s (100°C and over)	
W-2S	250°C or below	±3000mmAq	30m/s	Effective for areas where accumulation of powder should be avoided
W-2D	250°C or below	±3000mmAq	50m/s	
W-3	250°C or below	±25000mmAq (below 100°C)	25m/s (below 100°C)	Effective for various areas due to high pressure and excellent vibration and displacement absorption
		±5000mmAq (100°C and over)	20m/s (100°C and over)	
W-3S	250°C or below	±25000mmAq (below 100°C)	30m/s	
		±5000mmAq (100°C and over)		
W-3D	250°C or below	±25000mmAq (below 100°C)	50m/s	
		±5000mmAq (100°C and over)		

CAD drawings are prepared when necessary.

Product introduction



W-1

For Gas, Air (Normal Temperature)



W-3

(Inner surface: CR, Outer surface: Polyethylene)



W-3

(Fluorine rubber cloth, PTFE applied)