

PILLAR Insulation Material Series

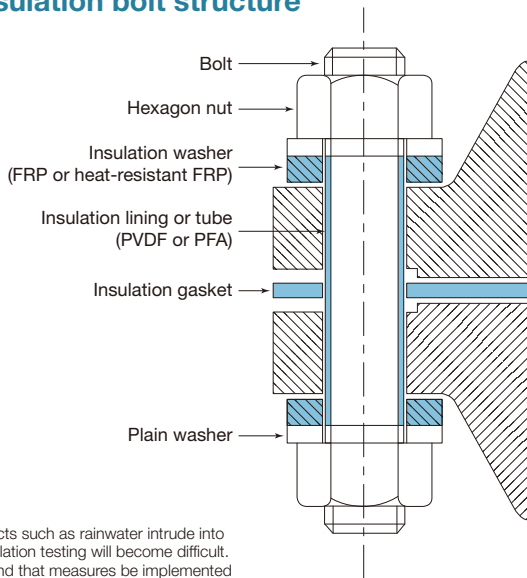
PILLAR AC Bolts (Insulation Bolts)



Easy-to-handle insulation bolts for pipe corrosion protection, with the insulation lining diameter almost equal to the effective diameter of a thread



AC insulation bolt structure



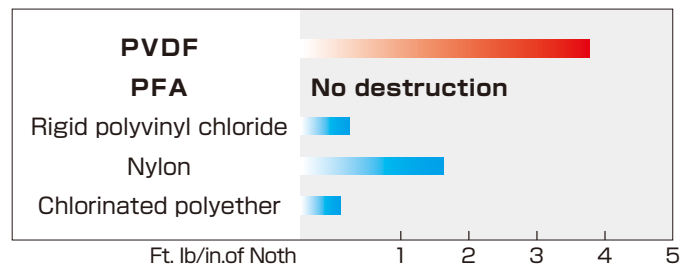
* If foreign objects such as rainwater intrude into the flange, isolation testing will become difficult. We recommend that measures be implemented to prevent intrusion.

- PVDF solidly coated on the bolt (or PFA tube for high-temperature applications) provides high-level insulating capability, as well as stable corrosion resistance and weather resistance.
- The insulation washer employs FRP (or heat-resistant FRP for high-temperature applications) as the standard material.
- Bolt standards are based on ANSI and JIS, and thread standards employ ANSI unified threads and JIS metric threads.
- The insulated section of bolts for normal-temperature applications is PVDF, the bolt material is SS400, and surface treatment is electrogalvanizing. The insulated section of bolts for high-temperature applications is a PFA tube, the bolt material is SNB7, and bolts are subjected to anti-rust treatment.

Operating temperature range of AC insulation bolt

Applications	Product number	Temperature °C
For general use	No.4650	-60 to 120
For high temperature	No.4650H	-196 to 200

Impact strength comparison of insulation materials



Characteristics of each insulation material

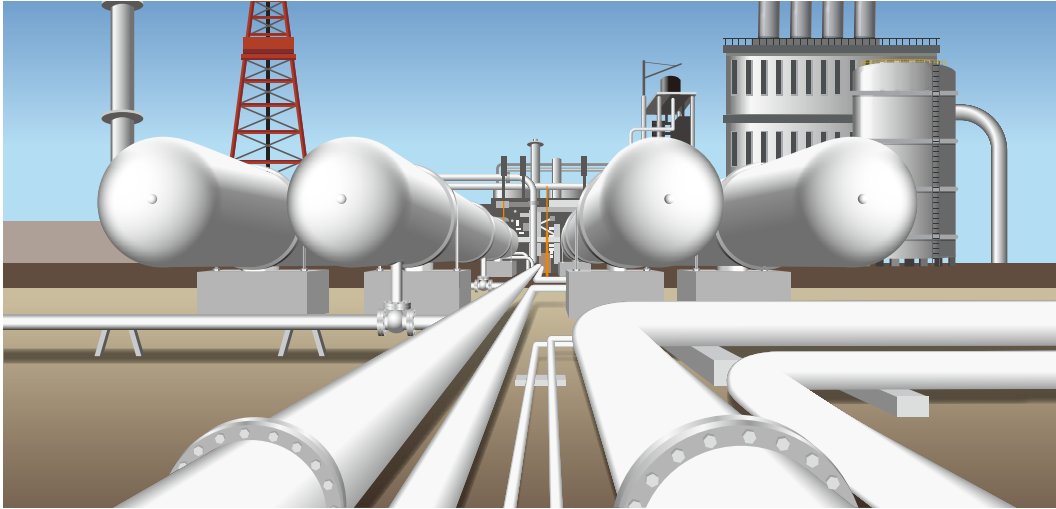
Material	Tensile strength N/m ² (kg/cm ²)	Elongation %	Compressive strength N/m ² (kg/cm ²)	Hardness	Dielectric strength kV/mm	Specific volume resistance Ω-cm
PVDF	42.2 to 71.5(430 to 730)	100 to 300	58.8(600)	Durometer D75 to 80	10	5×10 ¹³
PFA	27.5 to 30.9(280 to 315)	280 to 300	11.8(120)	Shore D60	20	10 ¹⁸ or more
FRP	245 to 343(2500 to 3500)	—	343 to 441(3500 to 4500)	Rockwell M100 to 110	23 to 33	5×10 ¹¹ or more
Phenolic cotton cloth	68.6 to 108(700 to 1100)	—	245 to 343(2500 to 3500)	Rockwell M90 to 100	13 to 17	10 ¹⁰ to 10 ¹¹
Vinyl chloride resin (soft)	9.8 to 24.5(100 to 250)	200 to 450	5.9 to 11.8(60 to 120)	Shore A40 to 110	11 to 40	10 ¹¹ to 10 ¹³
Heat-resistant FRP	—	—	392(4000 or more)	Rockwell M120	35	5×10 ¹⁴ or more

Note: The values shown above are typical characteristic values.

PILLAR AC Bolts (Insulation Bolts)

■ Applications of AC insulation bolts

- City gas and water supply pipes, other pipelines

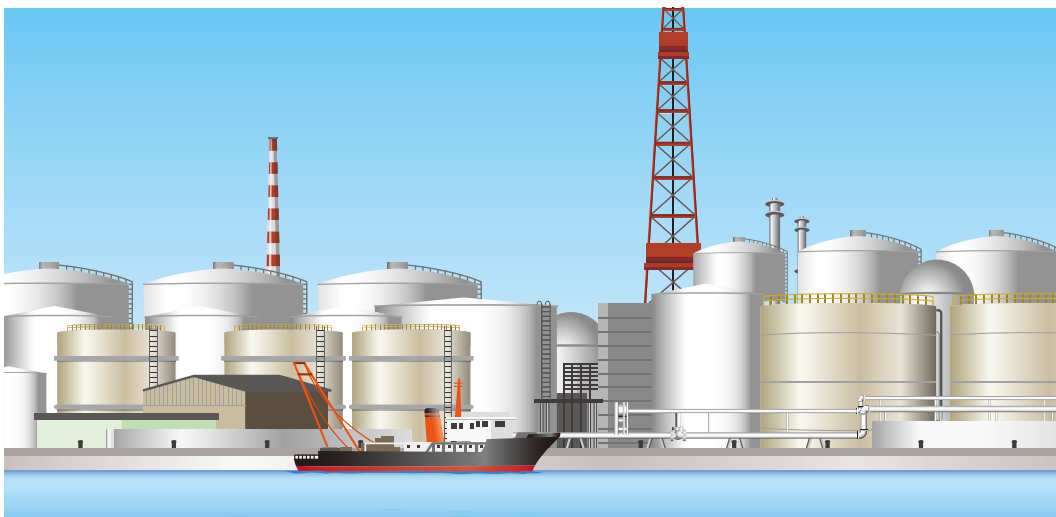


- Ships



To ballast line

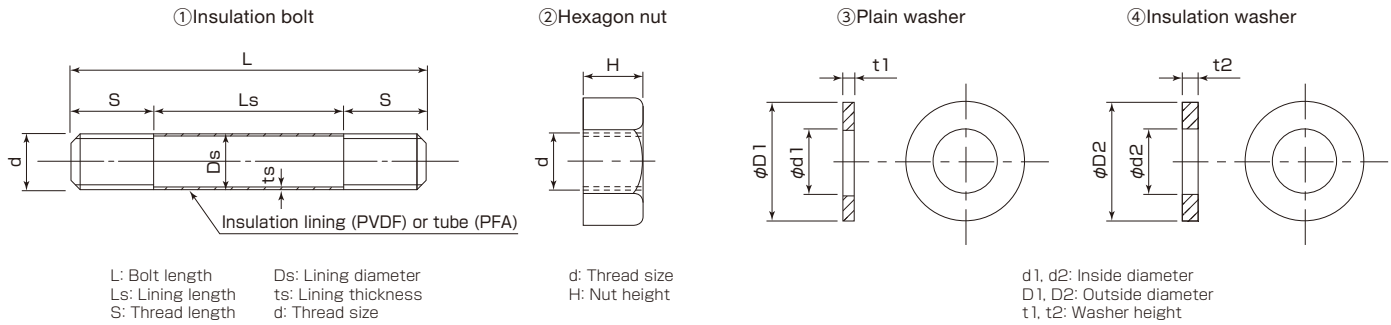
- Plants



Seawater pipes, condensers, tanks, heat exchangers, hot water boilers, oxygen equipment, etc. in power plants, steel mills, and petroleum plants

PILLAR AC Bolts (Insulation Bolts)

Contents of AC insulation bolt set



AC insulation bolt set materials (Example)

No.	Part name	For general use	For high temperature	For water supply
①	Insulation bolt	SS400+PVDF	SNB7+PFA	SUS304/SUS316+PVDF
②	Hexagon nut	SS400	S45C	SUS304/SUS316
③	Plain washer	SS400	SS400	SUS304/SUS316
④	Insulation washer	FRP	Heat-resistant FRP	FRP

Size tables of “② Hexagon nut,” “③ Plain washer,” and “④ Insulation washer”

(The size of “① Insulation bolt” differs according to the flange standards. Refer to page 4 and subsequent pages.)

Size table for parts with metric threads

Unit: mm

Nominal thread diameter d	② Hexagon nut H	③ Plain washer			④ Insulation washer		
		d1	D1	t1	d2	D2	t2
M10	8	10.5(10)	21	2	10.5	21	4
M12	10	13(12)	24	2.5	13	24	4
(M14)	11	15	28	2.5	15	28	4
M16	13	17	30	3	17	30	4
(M18)	15	19	34	3	19	34	4
M20	16	21	37	3	21	37	4
(M22)	18	23	39	3	23	39	6
M24	19	25	44	4	25	44	6
(M27)	22	28	50	4	28	50	6
M30	24	31	56	4	31	56	6
(M33)	26	34	60	5	34	60	6
M36	29	37	66	5	37	66	6
(M39)	31	40	72	6	40	72	6
M42	34	43	78	7	43	78	6
(M45)	36	46	85	7	46	85	6
M48	38	50	92	8	50	92	6
(M52)	42	54	98	8	54	98	6
M56	45	58	105	9	58	105	6
(M60)	48	62	110	9	62	110	6
M64	51	66	115	9	66	115	6

Note:
The inside and outside diameters are based on JIS B1256-1978 polished plain round washers.
The values in parentheses in the “d1” column apply when SUS materials are used.

Size table for parts with unified threads

Unit: mm

Nominal thread diameter d	② Hexagon nut H	③ Plain washer			④ Insulation washer		
		d1	D1	t1	d2	D2	t2
½ – UNC	12.7	13.5	26	2.3(2)	13.5	26	4
¾ – UNC	15.9	17	32	2.6(2)	17	32	4
1 – UNC	19.1	21	40	3.2(3)	21	40	4
1 ¼ – UNC	22.2	23.5	44	3.2(3)	23.5	44	6
1 ½ – UNC	25.4	27	52	4(3)	27	52	6
1 ½ – 8UN	28.6	31.5	58	4.5(3)	30	58	6
1 ¾ – 8UN	31.8	34.5	62	4.5(4)	33.5	62	6
2 – 8UN	34.9	38	68	5(4)	37	68	6
2 ¼ – 8UN	38.1	41	72	5	40	72	6
2 ½ – 8UN	41.3	44	78	6	44	78	6
3 – 8UN	44.5	47	82	6	47	82	6
3 ½ – 8UN	47.6	50	88	6	50	88	6
4 – 8UN	50.8	54	95	6	54	95	6
4 ½ – 8UN	57.2	60	103	8	60	103	6
5 – 8UN	63.5	67	115	8	67	115	6
5 ½ – 8UN	68.9	73	125	8	73	125	6

Note:
The inside and outside diameters are based on JIS B1256-1963 polished plain round washers for Whitworth threads.
The values in parentheses in the “t1” column apply when SUS materials are used.
However, metric threads apply to plain washers for 1 1/8-8UN to 1 1/2-8UN threads.

For JIS specifications

JIS 5K Size table

Unit: mm

Applicable flange nominal diameter	d	L	S	① Insulation bolt				Qty n
				Lining section dimensions			Qty n	
				Ds	Ls	ts		
					For normal temperature	For high temperature		
10A	M10	60	16	10	28	0.6	0.3	4
15A	M10	60	16	10	28	0.6	0.3	4
20A	M10	65	17	10	31	0.6	0.3	4
25A	M10	65	17	10	31	0.6	0.3	4
32A	M12	70	17	12	36	0.6	0.3	4
40A	M12	70	17	12	36	0.6	0.3	4
50A	M12	75	18	12	39	0.6	0.3	4
65A	M12	75	18	12	39	0.6	0.3	4
80A	M16	80	20	16	40	0.7	0.4	4
90A	M16	80	20	16	40	0.7	0.4	4
100A	M16	85	21	16	43	0.7	0.4	8
125A	M16	85	21	16	43	0.7	0.4	8
150A	M16	90	21	16	48	0.7	0.4	8
175A	M20	95	24	19.6	47	0.7	0.5	8
200A	M20	100	24	19.6	52	0.7	0.5	8
225A	M20	100	24	19.6	52	0.7	0.5	12
250A	M20	105	25	19.6	55	0.7	0.5	12
300A	M20	110	27	19.6	56	0.7	0.5	12
350A	M22	120	29	21.6	62	0.7	0.5	12
400A	M22	120	29	21.6	62	0.7	0.5	16
450A	M22	120	29	21.6	62	0.7	0.5	16
500A	M22	120	29	21.6	62	0.7	0.5	20
550A	M24	125	29	23.3	67	0.7	0.5	20
600A	M24	125	29	23.3	67	0.7	0.5	20

JIS 10K Size table

Unit: mm

Applicable flange nominal diameter	d	L	S	① Insulation bolt				Qty n
				Lining section dimensions			Qty n	
				Ds	Ls	ts		
					For normal temperature	For high temperature		
10A	M12	70	17	12	36	0.6	0.4	4
15A	M12	70	17	12	36	0.6	0.4	4
20A	M12	75	18	12	39	0.6	0.4	4
25A	M16	80	20	16	40	0.7	0.4	4
32A	M16	85	21	16	43	0.7	0.4	4
40A	M16	85	21	16	43	0.7	0.4	4
50A	M16	85	21	16	43	0.7	0.4	4
65A	M16	90	21	16	48	0.7	0.4	4
80A	M16	90	21	16	48	0.7	0.4	8
90A	M16	90	21	16	48	0.7	0.4	8
100A	M16	90	21	16	48	0.7	0.4	8
125A	M20	100	24	19.6	52	0.7	0.5	8
150A	M20	105	25	19.6	55	0.7	0.5	8
175A	M20	105	25	19.6	55	0.7	0.5	12
200A	M20	105	25	19.6	55	0.7	0.5	12
225A	M20	110	27	19.6	56	0.7	0.5	12
250A	M22	120	29	21.6	62	0.7	0.5	12
300A	M22	120	29	21.6	62	0.7	0.5	16
350A	M22	125	28	21.6	69	0.7	0.5	16
400A	M24	130	29	23.3	72	0.7	0.5	16
450A	M24	135	29	23.3	77	0.7	0.5	20
500A	M24	135	29	23.3	77	0.7	0.5	20
550A	M30 × 3	150	34	29.3	82	0.7	0.5	20
600A	M30 × 3	150	34	29.3	82	0.7	0.5	24

For ANSI specifications

ANSI 150LB Size table

Unit: mm

Applicable flange nominal diameter	d	Number of threads per 25.4 mm	L	S	① Insulation bolt				Qty n
					Lining section dimensions				
					Ds	Ls	ts		
		For normal temperature	For high temperature						
½B	½ – UNC	13	82	23	12.8	36	0.7	0.4	4
¾B	½ – UNC	13	82	23	12.8	36	0.7	0.4	4
1B	½ – UNC	13	86	23	12.8	40	0.7	0.4	4
1¼B	½ – UNC	13	92	23	12.8	46	0.7	0.4	4
1½B	½ – UNC	13	92	23	12.8	46	0.7	0.4	4
2B	¾ – UNC	11	103	26	15.8	51	0.7	0.4	4
2½B	¾ – UNC	11	109	26	15.8	57	0.7	0.4	4
3B	¾ – UNC	11	113	26	15.8	61	0.7	0.4	4
3½B	¾ – UNC	11	113	26	15.8	61	0.7	0.4	8
4B	¾ – UNC	11	113	26	15.8	61	0.7	0.4	8
5B	¾ – UNC	10	121	29	18.8	63	0.7	0.5	8
6B	¾ – UNC	10	121	29	18.8	63	0.7	0.5	8
8B	¾ – UNC	10	130	29	18.8	72	0.7	0.5	8
10B	7⁄8 – UNC	9	148	35	21.8	78	0.7	0.5	12
12B	7⁄8 – UNC	9	148	35	21.8	78	0.7	0.5	12
14B	1 – UNC	8	165	39	24.7	87	0.7	0.5	12
16B	1 – UNC	8	165	39	24.7	87	0.7	0.5	16
18B	1½ – 8UN	8	183	44	27.9	95	0.7	0.5	16
20B	1½ – 8UN	8	191	44	27.9	103	0.7	0.5	20
24B	1½ – 8UN	8	207	47	31.0	113	0.7	0.5	20

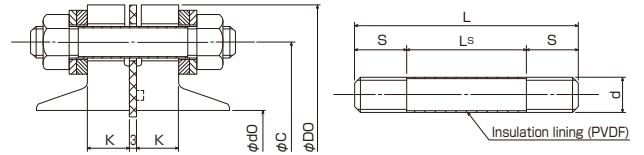
ANSI 300LB Size table

Unit: mm

Applicable flange nominal diameter	d	Number of threads per 25.4 mm	L	S	① Insulation bolt				Qty n
					Lining section dimensions				
					Ds	Ls	ts		
		For normal temperature	For high temperature						
½B	½ – UNC	13	86	23	12.8	40	0.7	0.4	4
¾B	¾ – UNC	11	98	26	15.7	46	0.7	0.4	4
1B	¾ – UNC	11	98	26	15.7	46	0.7	0.4	4
1¼B	¾ – UNC	11	103	26	15.7	51	0.7	0.4	4
1½B	¾ – UNC	10	115	30	18.8	55	0.7	0.5	4
2B	¾ – UNC	11	109	26	15.7	57	0.7	0.4	8
2½B	¾ – UNC	10	121	29	18.8	63	0.7	0.5	8
3B	¾ – UNC	10	130	29	18.8	72	0.7	0.5	8
3½B	¾ – UNC	10	136	30	18.8	76	0.7	0.5	8
4B	¾ – UNC	10	136	30	18.8	76	0.7	0.5	8
5B	¾ – UNC	10	145	30	18.8	85	0.7	0.5	8
6B	¾ – UNC	10	145	30	18.8	85	0.7	0.5	12
8B	7⁄8 – UNC	9	168	35	21.8	98	0.7	0.5	12
10B	1 – UNC	8	190	40	24.7	110	0.7	0.5	16
12B	1½ – 8UN	8	204	44	27.9	116	0.7	0.5	16
14B	1½ – 8UN	8	212	44	27.9	124	0.7	0.5	20
16B	1½ – 8UN	8	224	47	31.0	130	0.7	0.5	20
18B	1½ – 8UN	8	230	47	31.0	136	0.7	0.5	24
20B	1½ – 8UN	8	238	47	31.0	144	0.7	0.5	24
24B	1½ – 8UN	8	268	55	37.4	158	0.7	0.5	24

PILLAR AC Bolts (Insulation Bolts)

For water supply
(JIS G 3443-2 F specifications)



F12 Size table

Unit: mm

Applicable flange nominal diameter	Flange dimensions				① Insulation bolt				
	K	dO	C	DO	d	L	Ls	S	Qty n
80A	18	80.7	168	211	M16	92	48	22	4
100A	18	105.3	195	238	M16	92	48	22	4
125A	20	130.8	220	263	M16	95	51	22	6
150A	22	155.2	247	290	M16	100	56	22	6
200A	22	204.7	299	342	M16	100	56	22	8
250A	24	254.2	360	410	M20	115	61	27	8
300A	24	304.7	414	464	M20	115	61	27	10
350A	26	343.6	472	530	M22	125	67	29	10
400A	26	394.4	524	582	M22	125	67	29	12
450A	28	445.2	585	652	M24	135	71	32	12
500A	28	496.0	639	706	M24	135	71	32	12
600A	30	597.6	743	810	M24	140	76	32	16
700A	32	697.2 699.2	854	928	M30×3	155	79	38	16
800A	34	796.8 798.8	960	1034	M30×3	160	84	38	20
900A	36	898.4 900.4	1073	1156	M30×3	165	87	39	20
1000A	38	998.0 1000.0	1179	1262	M30×3	170	92	39	24
1100A	41	1097.6 1101.6	1283	1366	M30×3	175	97	39	24
1350A	45	1347.6 1351.6	1552	1642	M36×3	195	105	45	28
1500A	48	1496.0 1502.0	1710	1800	M36×3	205	115	45	32
1600A	53	1595.6 1601.6	1820	1915	M36×3	215	125	45	36
1650A	53	1646.4 1652.4	1870	1965	M36×3	215	125	45	40
1800A	55	1796.8 1802.8	2020	2115	M36×3	220	130	45	44
2000A	58	1996.0 2002.0	2230	2325	M42×3	240	134	53	48

F15 Size table

Unit: mm

Applicable flange nominal diameter	Flange dimensions				① Insulation bolt				
	K	dO	C	DO	d	L	Ls	S	Qty n
80A	18	80.7	150	185	M16	92	48	22	8
100A	18	105.3	175	210	M16	92	48	22	8
125A	20	130.8	210	250	M20	105	51	27	8
150A	22	155.2	240	280	M20	110	56	27	8
200A	22	204.7	290	330	M20	110	56	27	12
250A	24	254.2	355	400	M22	120	62	29	12
300A	24	304.7	400	445	M22	120	62	29	16
350A	26	343.6	445	490	M22	125	67	29	16
400A	28	394.4	510	560	M24	135	71	32	16
450A	30	445.2	565	620	M24	140	76	32	20
500A	30	496.0	620	675	M24	140	76	32	20
600A	34	597.6	730	795	M30×3	160	84	38	24
700A	34	697.2 699.2	840	905	M30×3	160	84	38	24
800A	36	796.8 798.8	950	1020	M30×3	165	87	39	28
900A	38	898.4 900.4	1050	1120	M30×3	170	92	39	28
1000A	42	998.0 1000.0	1160	1235	M36×3	190	100	45	28
1100A	43	1097.6 1101.6	1270	1345	M36×3	195	105	45	28
1200A	45	1197.2 1201.2	1380	1465	M36×3	195	105	45	32
1350A	51	1347.6 1351.6	1504	1630	M42×3	225	119	53	36
1500A	53	1496.0 1502.0	1700	1795	M42×3	230	124	53	40
1600A	58	1595.6 1601.6	1820	1915	M45×3	245	135	55	40
1650A	58	1646.4 1652.4	1870	1965	M45×3	245	135	55	40
1800A	59	1796.8 1802.8	2020	2115	M45×3	245	135	55	44
2000A	61	1996.0 2002.0	2230	2325	M45×3	255	145	55	48

PILLAR AC Bolts (Insulation Bolts)

F20 · 25 Size table

Unit: mm

Applicable flange nominal diameter	Flange dimensions				① Insulation bolt				
	K	dO	C	DO	d	L	Ls	S	Qty n
80A	22	80.1	160	200	M20	110	56	27	8
100A	22	104.5	185	225	M20	110	56	27	8
125A	23	129.6	225	270	M22	120	62	29	8
150A	27	154.2	260	305	M22	125	67	29	12
200A	27	203.5	305	350	M22	125	67	29	12
250A	28	254.6	380	430	M24	135	71	32	12
300A	30	305.7	430	480	M24	140	76	32	16
350A	34	343.6	480	540	M30×3	160	84	38	16
400A	38	394.4	540	605	M30×3	170	92	39	16
450A	40	445.2	605	675	M30×3	175	97	39	20
500A	42	496.0	660	730	M30×3	175	97	39	20
600A	46	597.6	770	845	M36×3	200	110	45	24
700A	50	697.2 699.2	875	960	M39×3	215	115	50	24
800A	54	796.8 798.8	990	1085	M45×3	235	125	55	24
900A	58	898.4 900.4	1090	1185	M45×3	245	135	55	28
1000A	64	998.0 1000.0	1210	1320	M52×3	275	149	63	28
1100A	67	1097.6 1101.6	1310	1420	M52×3	280	154	63	32
1200A	70	1197.2 1201.2	1420	1530	M52×3	285	159	63	32
1350A	76	1347.6 1351.6	1590	1700	M56×3	310	174	68	32
1500A	80	1496.0 1502.0	1750	1865	M56×3	315	179	68	36

F29 Size table

Unit: mm

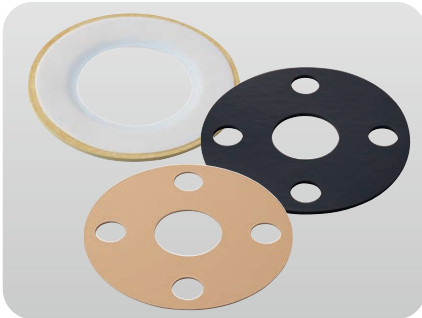
Applicable flange nominal diameter	Flange dimensions				① Insulation bolt				
	K	dO	C	DO	d	L	Ls	S	Qty n
80A	22	80.1	160	200	M20	110	56	27	8
100A	24	104.5	185	225	M20	115	61	27	8
125A	26	129.6	225	270	M22	125	67	29	8
150A	28	154.2	260	305	M22	130	72	29	12
200A	30	203.5	305	350	M22	135	75	30	12
250A	34	254.6	380	430	M24	150	86	32	12
300A	36	305.7	430	480	M24	150	86	32	16
350A	40	343.6	480	540	M30×3	175	97	39	16
400A	46	394.4	540	605	M30×3	185	107	39	16
450A	48	445.2	605	675	M30×3	190	112	39	20
500A	50	496.0	660	730	M30×3	195	117	39	20
600A	54	597.6	770	845	M36×3	215	125	45	24
700A	64	697.2	900	995	M45×3	255	145	55	24
800A	72	796.8	1030	1140	M52×3	290	164	63	24
900A	76	898.4	1140	1250	M52×3	300	174	63	28

*We also handle special sizes. Please contact us for details.

PILLAR insulation material series

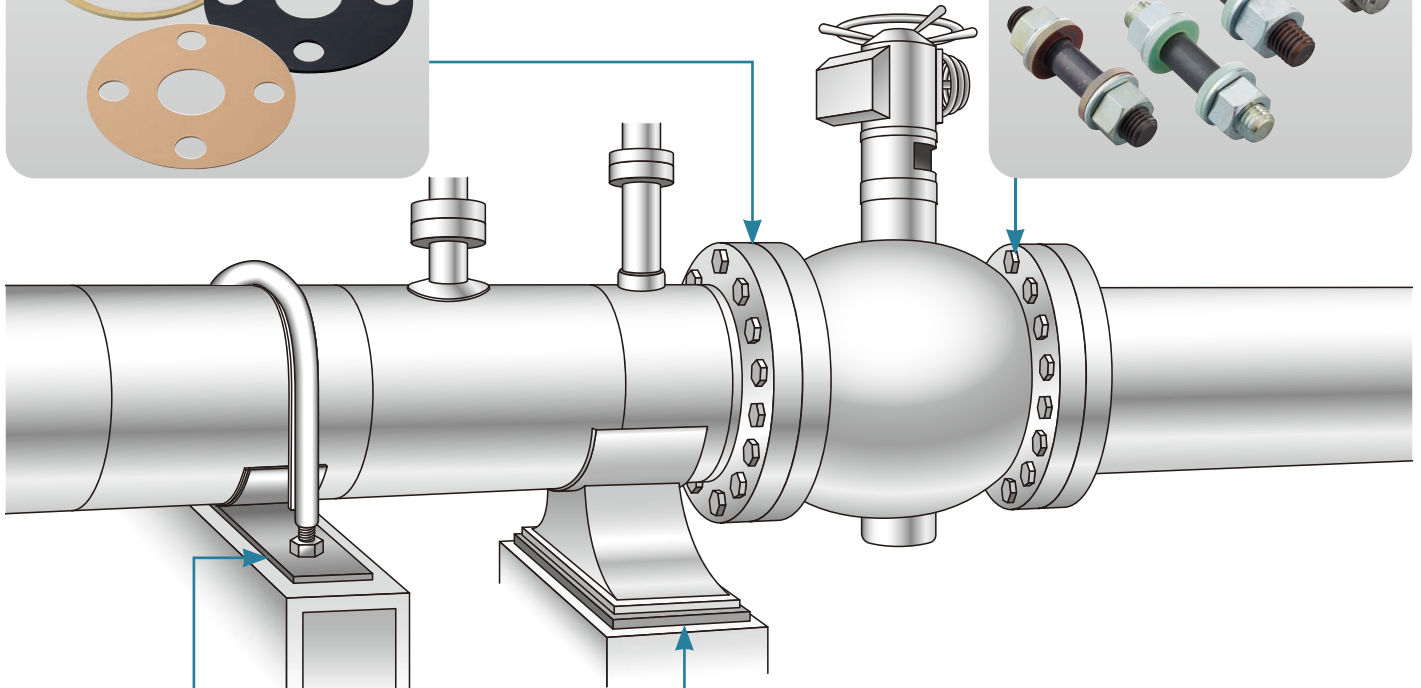
In this era of limited natural resources, there is a growing interest in metal corrosion prevention and technological innovation has made remarkable progress in this field. In response to these new trends, PILLAR has improved insulation bolts, pipe shoes (FLUOROGOLD and PILAFLO U-Bolt & Pad), and insulation gaskets to provide insulation for corrosion protection as a set, which has been well received.

Insulation gasket



Based on specifications such as fluid pressure, the most suitable gasket can be selected from more than 10 types of gaskets. (Please contact us to request specific brochures or documents.)

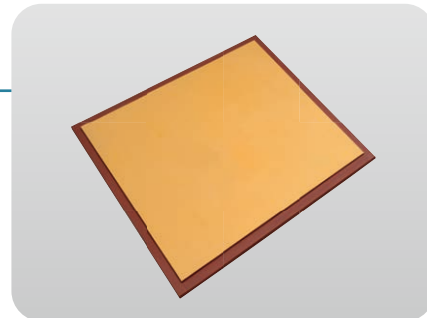
AC insulation bolts



PILAFLO™ U-Bolt & Pad



PILLAR FLUOROGOLD™ Slide Bearing



The PILLAR FLUOROGOLD Slide Bearing and PILAFLO U-Bolt & Pad are shoes that provide the function of a movable bearing that allows pipes and devices to expand and contract freely according to the temperature, taking advantage of the low coefficient of friction and insulating capability. They also provide the function of electrically insulating pipes and nozzles. (Please contact us to request specific brochures or documents.)

PILLAR PILLAR Corporation

CLEAN SAFETY FRONTIER

Head office/Sales Headquarters
7-1, Shinmachi 1-chome, Nishi-ku, Osaka 550-0013, Japan
Phone: +81-6-7166-8326 Fax: +81-6-7166-8514

Email : sales@pillar.co.jp

<https://www3.pillar.co.jp/en/product/>



Safety precaution

● When using this product, please use correctly and pay sufficient attention to safety.

* Please understand that this catalog may change without prior notice.
* The values shown on this catalog are reference values, not guaranteed values.