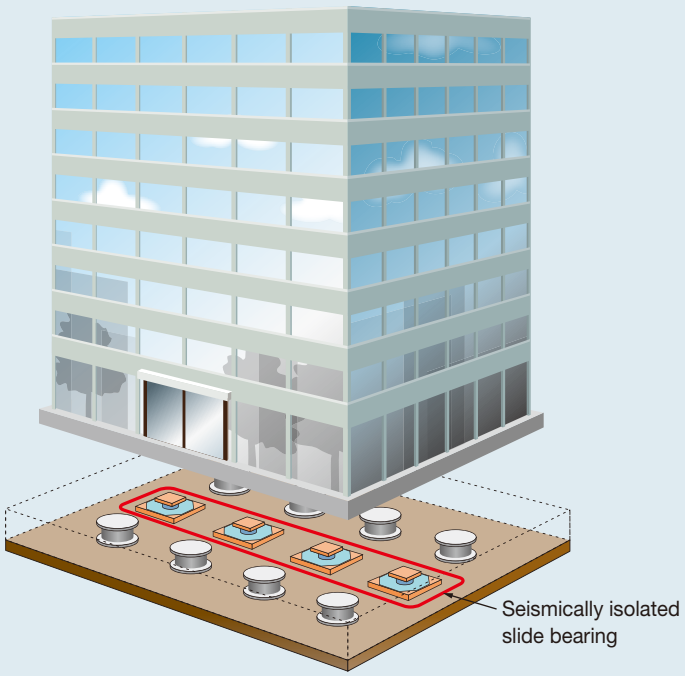
PILLAR Slide Bearing Series

Seismically Isolated Slide Bearing

PILLAR CLEAN SAFETY FRONTIER

Slide bearing for base-isolated buildings that applies low friction characteristics of fluorocarbon polymers

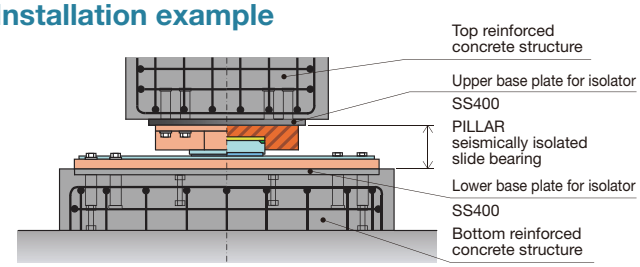


Installing this product under relatively lightweight structures such as auxiliary facilities (elevators, stairs, peripheral lower sections, etc.) of base-isolated buildings can make seismic isolation systems more effective.

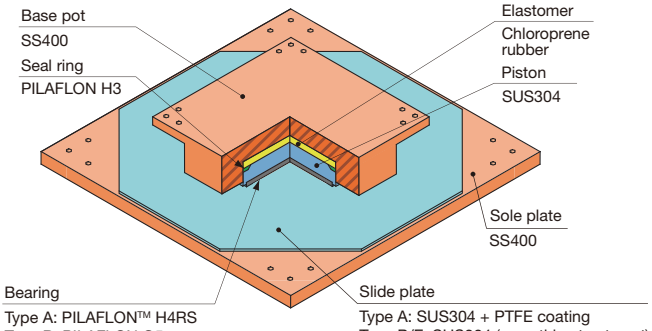
Features

- This product can be applied to a wide range of base-isolated buildings including low-rise buildings, high-rise buildings, factory facilities, and apartment houses.
- This product employs a simple structure, making maintenance easy.
- This product allows for tracking of large deformations and response to longer natural period of buildings.
- The elastomer sealed inside the base pot rotates vertically to allow for tilt and absorb an installation error of 1/500 (±0.11°).

Installation example



Structure

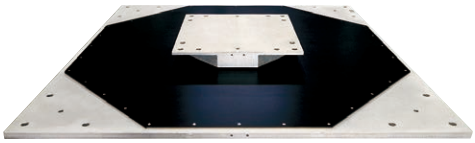


∗ PILAFLON is our trademark of molded products made of polytetrafluoroethylene (PTFE, PTFE containing filler).

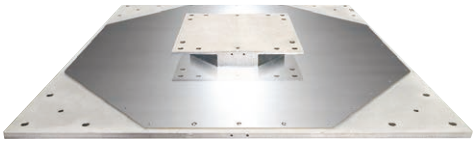
Product lineup

This product is classified into the following three types according to the coefficient of friction on sliding surfaces: Type A (μ = 0.011), Type B (μ = 0.095), and Type E (μ = 0.0080).

Type A



Type B
Type E



Minister certification

This product has been subjected to performance evaluation based on the regulations on Item 2 (seismic isolation materials) of Article 37 of the Building Standards Act and certified by the Minister of Land, Infrastructure, Transport and Tourism.

Certification number: MVBR-0606

Certification number: MVBR-0607

Certification number: MVBR-0623

PILLAR Corporation

Seismically Isolated Slide Bearing

Standard specifications

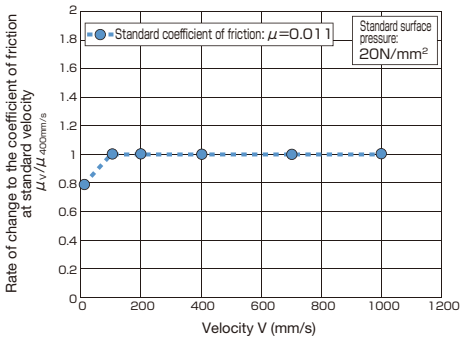
	Item		Certification number: MVBR−0606 Type A μ=0.011	Certification number: MVBR−0607 Type B μ=0.095	Certification number: MVBR−0623 Type E μ=0.0080
Standard materials	Metal materials*1		SS400 (JIS G 3101), SUS304 (JIS G 4303/4304/4305)		
	Bearing		PILAFLON H4RS	PILAFLON G5	PILAFLON H4RS-D
	Slide plate*1		SUS304+PTFE coating	SUS304 subjected to smoothing treatment	SUS304 subjected to smoothing treatment
	Rubber		Chloroprene rubber (JIS K 6386−C08)		
	Painting*2		Undercoat: Zinc-rich paint Intermediate coat: Epoxy resin paint Topcoat: Epoxy resin paint (Munsell N6.0 light gray)		
Standard design conditions	Long-term vertical load	kN	100 to 10000		
	Short-term vertical load	kN	200 to 20000 (Long-term vertical load × 2.0)		
	Standard coefficient of friction*3		0.011	0.095	0.0080
	Variations in coefficient of friction	%	±30	±20	±40
	Standard surface pressure	N/mm²	20		
	Displacement magnitude	mm	±300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900		

*1 Base pots and sole plates can also be made of rolled steel for welded structures. Similarly, slide plates can also be made of SUS316 stainless steel.
*2 Galvanization can also be applied instead of painting.
*3 These values are applicable when the surface pressure is 20 N/mm², the maximum speed of a sine wave is 400 mm/s, and the third cycle is in operation.

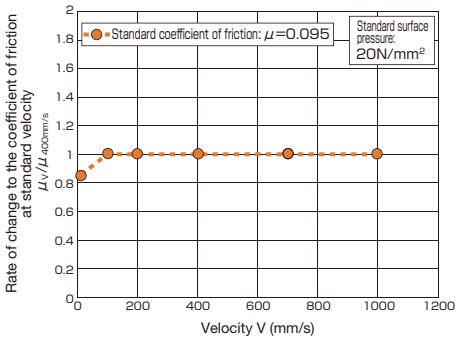
Performance

Velocity dependence

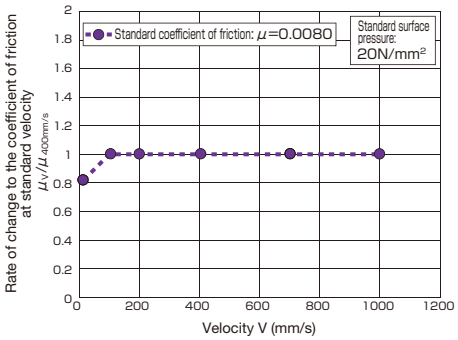
Type A



Type B

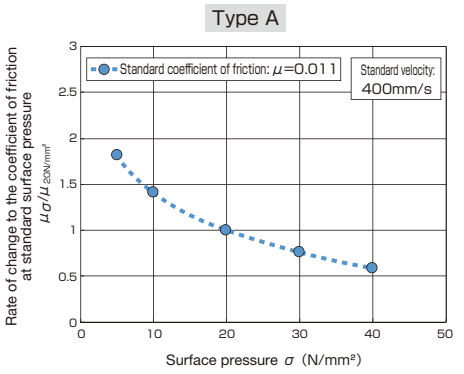


Type E

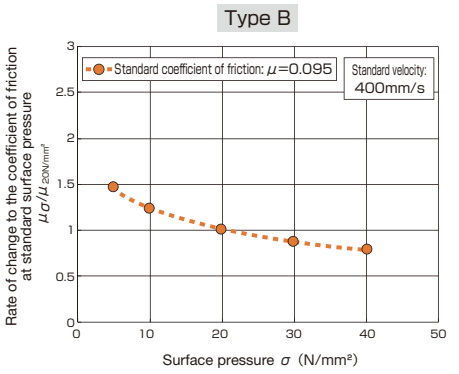


Surface pressure dependence

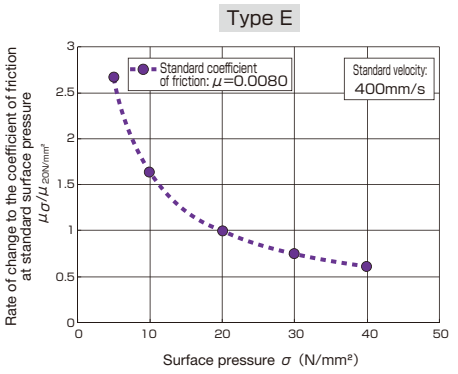
Type A



Type B



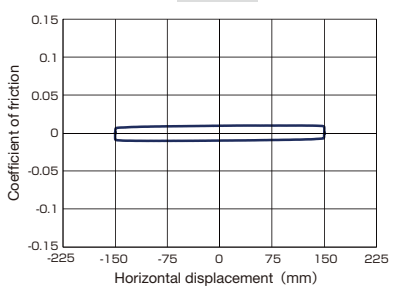
Type E



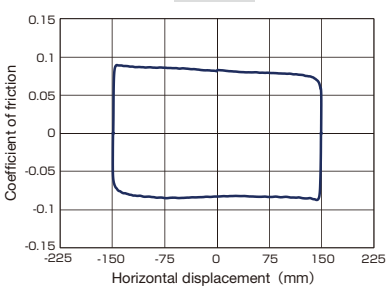
Hysteresis loop

* These loops are applicable at the standard surface pressure and standard velocity and in the third cycle.

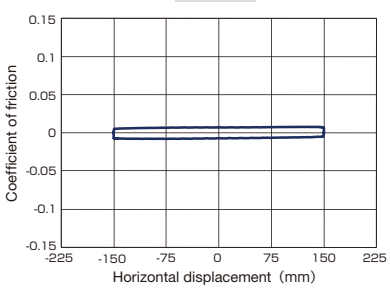
Type A



Type B



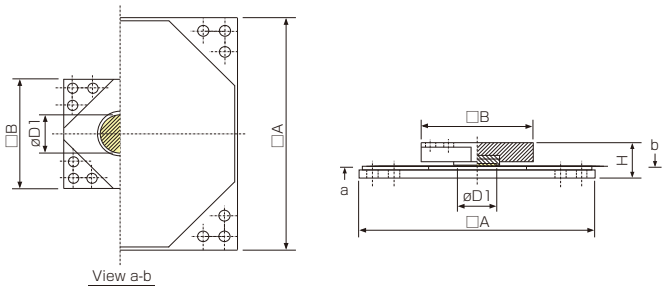
Type E



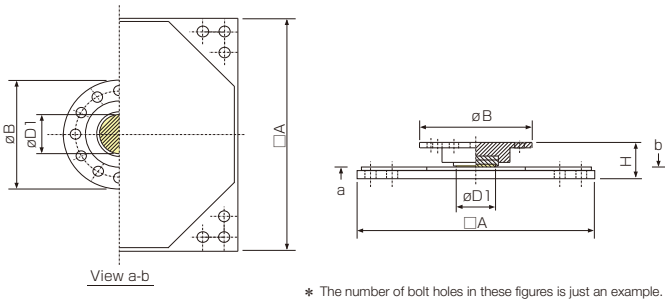
Seismically Isolated Slide Bearing

Standard dimensions

Square-shaped base pot specification



Round-shaped base pot specification



∗ The number of bolt holes in these figures is just an example.

Type A / Type B

Model		Type A	FMA0010	FMA0020	FMA0030	FMA0040	FMA0050	FMA0075	FMA0100	FMA0200	FMA0300	FMA0400	FMA0500	FMA0600	FMA0700	FMA0800	FMA0900	FMA1000
		Type B	FMB0010	FMB0020	FMB0030	FMB0040	FMB0050	FMB0075	FMB0100	FMB0200	FMB0300	FMB0400	FMB0500	FMB0600	FMB0700	FMB0800	FMB0900	FMB1000
Long-term vertical load		kN	100	200	300	400	500	750	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Short-term vertical load		kN	200	400	600	800	1000	1500	2000	4000	6000	8000	10000	12000	14000	16000	18000	20000
Bearing diameter φD1		mm	80	114	140	160	180	220	254	358	438	506	566	620	668	714	758	798
Square-shaped base pot outer length □B*1		mm	200	220	250	270	290	370	400	540	650	740	830	900	980	1050	1130	1150
Round-shaped base pot outside diameter φB*1		mm	260	290	330	360	390	440	480	630	770	890	990	1090	1120	1200	1290	1300
Sole plate outer length □A*1	Deformation limit	±300 mm	800	830	860	880	900	940	970	1080	1160	1240	1340	1420	1510	1590	1660	1690
		±350 mm	900	930	960	980	1000	1040	1070	1180	1260	1340	1440	1520	1610	1690	1760	1790
		±400 mm	1000	1030	1060	1080	1100	1140	1170	1280	1360	1430	1490	1560	1650	1730	1800	1830
		±450 mm	1100	1130	1160	1180	1200	1240	1270	1380	1460	1530	1590	1660	1750	1830	1900	1930
		±500 mm	1210	1240	1270	1290	1300	1340	1380	1490	1560	1630	1690	1740	1800	1860	1930	1960
		±550 mm	1310	1340	1370	1390	1400	1440	1480	1590	1660	1730	1790	1840	1900	1960	2030	2060
		±600 mm	1400	1430	1460	1480	1500	1540	1570	1680	1760	1830	1890	1940	1990	2030	2090	2120
		±650 mm	1500	1530	1560	1580	1600	1640	1670	1780	1860	1930	1990	2040	2090	2130	2190	2220
		±700 mm	1600	1630	1660	1680	1700	1740	1770	1880	1960	2030	2090	2140	2190	2230	2280	2320
		±750 mm	1700	1730	1760	1780	1800	1840	1870	1980	2060	2130	2190	2240	2290	2330	2380	2420
		±800 mm	1800	1830	1860	1880	1900	1940	1970	2080	2160	2230	2290	2340	2390	2430	2480	2520
		±850 mm	1900	1930	1960	1980	2000	2040	2070	2180	2260	2330	2390	2440	2490	2530	2580	2620
		±900 mm	2000	2030	2060	2080	2100	2140	2170	2280	2360	2430	2490	2540	2590	2630	2680	2720
Product height H*1	Deformation limit	±300 mm	92	92	92	92	92	95	98	112	127	129	143	147	167	172	172	192
		±350 mm	92	92	92	92	92	95	98	112	127	129	143	147	167	172	174	194
		±400 mm	92	92	92	92	92	95	98	112	127	129	143	147	169	174	174	194
		±450 mm	92	92	92	92	92	95	98	112	127	129	145	149	169	174	174	194
		±500 mm	92	92	92	92	92	95	98	112	127	131	145	149	169	174	174	194
		±550 mm	92	92	92	92	92	95	98	114	129	131	145	149	169	174	174	194
		±600 mm	92	92	92	92	92	95	100	114	129	131	145	149	169	174	174	194
		±650 mm	92	92	92	94	94	97	100	114	129	131	145	149	169	174	174	194
		±700 mm	94	94	94	94	94	97	100	114	129	131	145	149	169	174	174	194
		±750 mm	94	94	94	94	94	97	100	114	129	131	145	149	169	174	174	194
		±800 mm	94	94	94	94	94	97	100	114	129	131	145	149	169	174	174	194
		±850 mm	94	94	94	94	94	97	100	114	129	131	145	149	169	174	174	194
		±900 mm	94	94	94	94	94	97	100	114	129	131	145	149	169	174	174	194

Note: Bearings can be installed upside down. ∗1 Lengths □A, □B, øB, and H can be changed within a range that does not affect performance.

Type E

Model			FME0010	FME0020	FME0030	FME0040	FME0050	FME0075	FME0100	FME0200	FME0300	FME0400	FME0500	FME0600	FME0700	FME0800	FME0900	FME1000
Long-term vertical load		kN	100	200	300	400	500	750	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Short-term vertical load		kN	200	400	600	800	1000	1500	2000	4000	6000	8000	10000	12000	14000	16000	18000	20000
Bearing diameter φD1		mm	80	114	140	160	180	220	254	358	438	506	566	620	668	714	758	798
Square-shaped base pot outer length □B*1		mm	200	220	240	260	270	300	350	500	600	720	790	890	920	1000	1090	1100
Round-shaped base pot outside diameter φB*1		mm	260	290	320	340	360	400	450	610	710	850	920	1020	1090	1170	1290	1300
Sole plate outer length □A*1	Deformation limit	±300 mm	800	830	860	880	900	940	970	1080	1160	1240	1340	1420	1510	1590	1660	1690
		±350 mm	900	930	960	980	1000	1040	1070	1180	1260	1340	1440	1520	1610	1690	1760	1790
		±400 mm	1000	1030	1060	1080	1100	1140	1170	1280	1360	1430	1490	1560	1650	1730	1800	1830
		±450 mm	1100	1130	1160	1180	1200	1240	1270	1380	1460	1530	1590	1660	1750	1830	1900	1930
		±500 mm	1210	1240	1270	1290	1300	1340	1380	1490	1560	1630	1690	1740	1800	1860	1930	1960
		±550 mm	1310	1340	1370	1390	1400	1440	1480	1590	1660	1730	1790	1840	1900	1960	2030	2060
		±600 mm	1400	1430	1460	1480	1500	1540	1570	1680	1760	1830	1890	1940	1990	2030	2090	2120
		±650 mm	1500	1530	1560	1580	1600	1640	1670	1780	1860	1930	1990	2040	2090	2130	2190	2220
		±700 mm	1600	1630	1660	1680	1700	1740	1770	1880	1960	2030	2090	2140	2190	2230	2280	2320
		±750 mm	1700	1730	1760	1780	1800	1840	1870	1980	2060	2130	2190	2240	2290	2330	2380	2420
		±800 mm	1800	1830	1860	1880	1900	1940	1970	2080	2160	2230	2290	2340	2390	2430	2480	2520
		±850 mm	1900	1930	1960	1980	2000	2040	2070	2180	2260	2330	2390	2440	2490	2530	2580	2620
		±900 mm	2000	2030	2060	2080	2100	2140	2170	2280	2360	2430	2490	2540	2590	2630	2680	2720
Product height H*1	Deformation limit	±300 mm	92	92	92	92	92	92	92	105	120	120	136	136	156	157	157	177
		±350 mm	92	92	92	92	92	92	92	105	120	120	136	136	156	157	159	179
		±400 mm	92	92	92	92	92	92	92	105	120	120	136	136	158	159	159	179
		±450 mm	92	92	92	92	92	92	92	105	120	120	138	138	158	159	159	179
		±500 mm	92	92	92	92	92	92	92	105	120	122	138	138	158	159	159	179
		±550 mm	92	92	92	92	92	92	92	107	122	122	138	138	158	159	159	179
		±600 mm	92	92	92	92	92	92	94	107	122	122	138	138	158	159	159	179
		±650 mm	92	92	92	94	94	94	94	107	122	122	138	138	158	159	159	179
		±700 mm	94	94	94	94	94	94	94	107	122	122	138	138	158	159	159	179
		±750 mm	94	94	94	94	94	94	94	107	122	122	138	138	158	159	159	179
		±800 mm	94	94	94	94	94	94	94	107	122	122	138	138	158	159	159	179
		±850 mm	94	94	94	94	94	94	94	107	122	122	138	138	158	159	159	179
		±900 mm	94	94	94	94	94	94	94	107	122	122	138	138	158	159	159	179

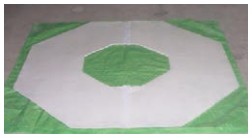
Note: Bearings can be installed upside down. ∗1 Lengths □A, □B, øB, and H can be changed within a range that does not affect performance.

Biaxial shear sliding testing machine

Products under performance verification testing

Dust cover (Optional)

For square-shaped base pot
∗ Dust cover arrangement (before joining)



For square-shaped base pot
∗ Dust cover arrangement (after joining)

Installation

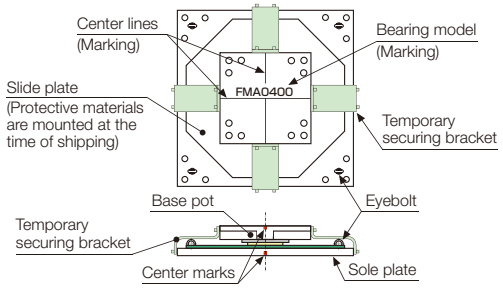
For information about fireproof coverings for seismically isolated slide bearings, please check with fireproof covering manufacturers.

Seismically Isolated Slide Bearing

Example of installation procedure

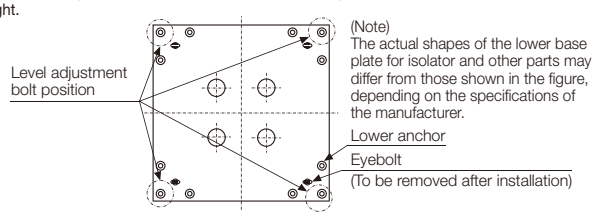
1. Style of packing for bearing

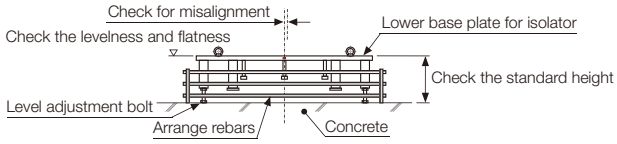
1.1 The bearing body has its upper and lower shoes secured with temporary securing brackets and is equipped with lifting eyebolts.
1.2 The slide plate of the bearing has protective materials (plywood with sponge sheets) mounted.



2. Installing the lower base plate for isolator (Reference)

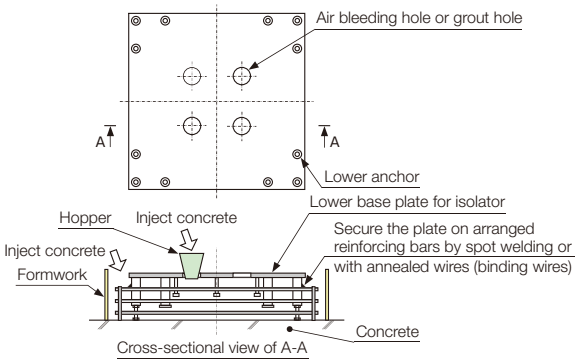
2.1 Mark the center of the bearing on the concrete.
2.2 Install the lower base plate for isolator so that it aligns with the center of the bearing.
2.3 Arrange reinforcing bars in the bottom structure so that they surround the anchor rebar on the bottom surface of the lower base plate for isolator.
2.4 Remove the eyebolts.
2.5 After confirming horizontal alignment between the base plate for isolator and the reference line, use the level adjustment bolts in the four corners to adjust levelness, flatness, and standard height.



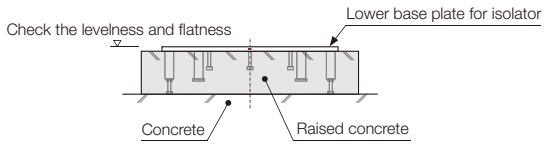


3. Casting raised concrete (Reference)

3.1 Firmly secure the lower anchor or lower anchor rebar and the arranged reinforcing bars by spot welding or with annealed wires (binding wires).
3.2 Install a formwork for raised concrete.
3.3 Cast concrete into a grout hole on the lower base plate for isolator or into a gap between the formwork and the lower base plate for isolator.

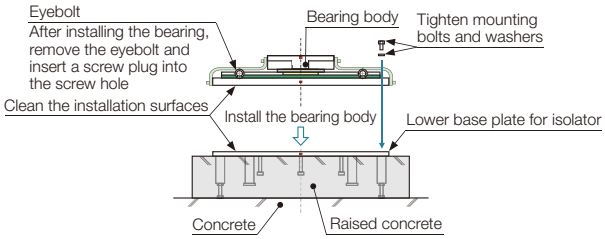


3.4 Check the levelness and flatness of the top surface of the lower base plate for isolator.



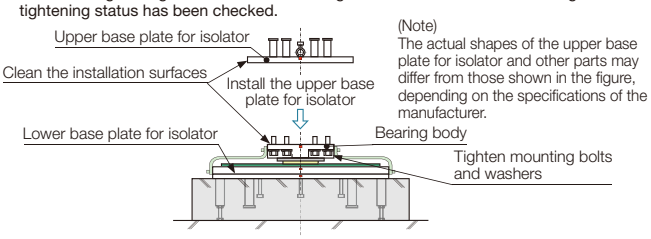
4. Installing the bearing body

4.1 Clean the installation surfaces (the top surface of the lower base plate for isolator and the bottom of the bearing body).
4.2 Install the bearing body and secure it with mounting bolts.
4.3 Check the tightening status of each mounting bolt and leave a mark indicating that the tightening status has been checked.
4.4 Remove the eyebolts from the bearing body and insert a screw plug into the screw hole for each eyebolt.



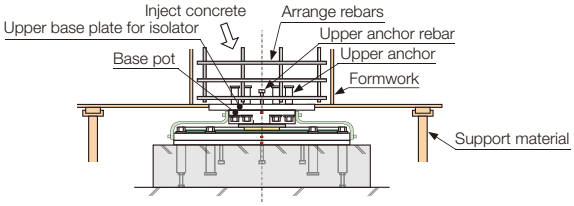
5. Installing the upper base plate for isolator

5.1 Clean the installation surfaces (the top surface of the bearing body and the bottom of the upper base plate for isolator).
5.2 Install the upper base plate for isolator and secure it with mounting bolts.
5.3 Check the tightening status of each mounting bolt and leave a mark indicating that the tightening status has been checked.



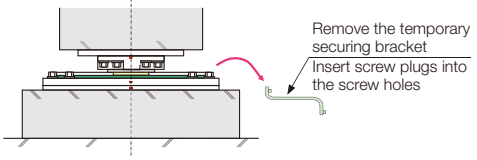
6. Installing the top structure

6.1 Check the fitting status of the upper anchor and upper anchor rebar first and then arrange reinforcing bars in the top structure.
6.2 Assemble a formwork around the upper base plate for isolator.
6.3 Cast concrete.
6.4 After the specified concrete curing period elapses, remove the formwork.

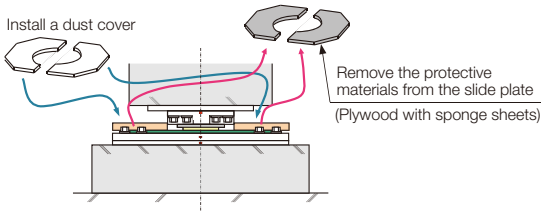


7. Finishing installation

7.1 Because of the building construction work process, make a plan to remove the temporary securing brackets when the bearing is ready to work and there are no problems.
7.2 Remove the temporary securing bracket and insert screw plugs (accessories) into the screw holes from which the temporary securing bracket was removed.



7.3 Remove the protective materials from the slide plate and install a dust cover (optional).



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Safety precaution

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

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