

TETRON SB SPHERICAL BEARINGS

There are three types of bearing, distinguished by their movement capacity:

Type	Free sliding bearing	Guided sliding bearing	Fixed bearing
	GL	GGL/GGT	FX
Symbol			
Vertical load			
Rotation	 Up to 50 mrad	 Up to 50 mrad	 Up to 50 mrad
Movement Horizontal	 Multidirectional	 Unidirectional	 Blocked

Design basis

The structure of the bearings is designed on the basis of the following parameters:

- Vertical load;
- Acceptable movement;
- Acceptable rotation;
- Exposure temperatures;
- Acceptable stresses on the supports;
- Horizontal load.

The design can be produced in accordance with various standards, the most common of which are EN 1337 and AASHTO LRFD 2012.

Isoslide®, for compact, stronger bearings

Sliding surfaces conventionally formed by stainless steel/PTFE or chrome steel/PTFE contact accept limited stresses. Freyssinet therefore now offers a new material known as Isoslide® to replace the PTFE. Isoslide® accepts higher stresses, in most cases making it possible to reduce the bearing dimensions. The tables on the following pages show the two sliding material options available for TETRON SB bearings. Isoslide® is also five times more wear resistant than PTFE, which is particularly beneficial for applications involving frequent, repetitive movements.

Designation

The designation of TETRON SB bearings identifies their main characteristics.

GL Free sliding bearing	20,000 Vertical load at ULS in kN	•	250 Total acceptable longitudinal movement in mm	•	40 Total acceptable transverse movement in mm
GGT Transverse guided bearing		-	800 Vertical load at ULS in kN	•	40 Total acceptable transverse movement in mm
GGL Longitudinal guided bearing		-	800 Transverse load at ULS in kN	•	40 Total acceptable longitudinal movement in mm
FX Fixed bearing		-	900 Horizontal load at ULS in kN (resultant of x/y*)		

This gives the following designations, for example:

With PTFE

- TETRON SB GL 20,000.250.40
- TETRON SB GGL 20,000-800.40
- TETRON SB FX 20,000-900

With Isoslide®

- TETRON SB ISO GL 20,000.250.40
- TETRON SB ISO GGL 20,000-800.40
- TETRON SB ISO FX 20,000-900

*x: longitudinal axis
y: transverse axis

TETRON SB GL SPHERICAL BEARINGS



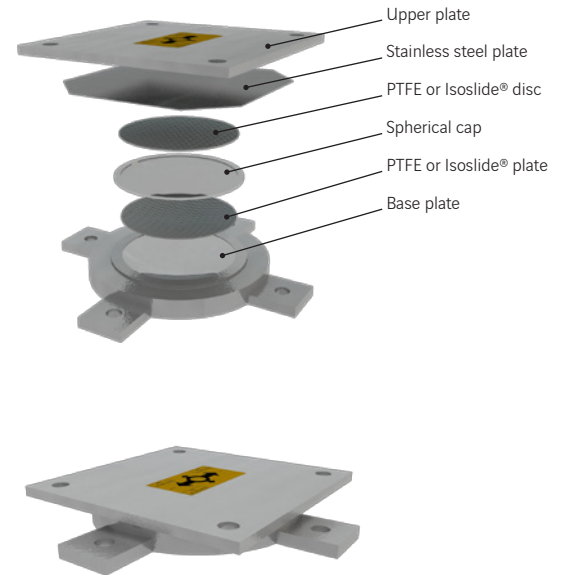
This free sliding spherical bearing is made up of a base plate, a chrome-plated spherical cap and a PTFE or Isoslide® plate, on which the upper plate can slide freely. The base plate is fixed to the support (pier, abutment, column, etc.) and the upper plate is fixed to the superstructure.

This model is designed to permit horizontal movements, without any resistance other than the internal friction.

Bearings with $\pm 50\text{mm}$ longitudinal and $\pm 20\text{mm}$ transverse movement

	PTFE								Isoslide®							
	EN				AASHTO				EN				AASHTO			
	ΦA	B	C	H	ΦA	B	C	H	ΦA	B	C	H	ΦA	B	C	H
GL 500 - 100 . 40	175	300	200	75	195	320	220	75	165	290	190	85	165	290	190	80
GL 1,000 - 100 . 40	220	350	250	85	250	380	280	80	170	290	200	90	170	290	200	90
GL 1,500 - 100 . 40	250	380	280	85	295	430	330	90	195	320	220	90	195	320	220	90
GL 2,000 - 100 . 40	280	420	320	95	330	470	370	90	215	340	240	90	215	340	240	90
GL 2,500 - 100 . 40	305	440	340	95	360	510	410	100	235	370	270	90	235	370	270	90
GL 3,000 - 100 . 40	330	470	370	100	385	530	430	105	250	380	280	100	255	380	280	95
GL 4,000 - 100 . 40	370	520	420	115	435	590	490	110	285	420	320	100	295	420	320	105
GL 5,000 - 100 . 40	420	570	470	120	480	640	540	110	320	460	370	105	330	450	360	105
GL 6,000 - 100 . 40	460	610	510	130	520	680	580	125	340	480	390	115	360	480	390	115
GL 8,000 - 100 . 40	540	690	590	135	590	760	660	140	400	530	450	120	415	530	450	120
GL 10,000 - 100 . 40	610	760	660	145	655	840	740	155	450	570	510	135	465	570	500	135
GL 12,000 - 100 . 40	675	820	720	155	710	900	800	155	500	610	550	145	510	610	540	140
GL 16,000 - 100 . 40	785	930	830	175	810	1,010	910	175	585	680	635	150	590	680	630	160
GL 20,000 - 100 . 40	880	1,030	930	190	895	1,100	1,000	190	660	740	710	165	660	740	700	170
GL 24,000 - 100 . 40	970	1,120	1,020	205	975	1,190	1,090	205	725	790	780	175	725	790	770	175
GL 28,000 - 100 . 40	1,055	1,200	1,100	225	1,045	1,270	1,170	210	790	850	840	195	775	850	830	195
GL 30,000 - 100 . 40	1,090	1,240	1,140	250	1,080	1,310	1,210	220	820	870	870	200	805	870	860	205
GL 35,000 - 100 . 40	1,180	1,330	1,230	250	1,165	1,410	1,310	240	890	940	940	200	875	940	940	215
GL 40,000 - 100 . 40	1,265	1,420	1,320	270	1,240	1,490	1,390	235	955	1,010	1,010	220	935	1,010	1,000	230
GL 45,000 - 100 . 40	1,345	1,500	1,400	275	1,310	1,570	1,470	255	1,015	1,070	1,070	220	995	1,070	1,060	250
GL 50,000 - 100 . 40	1,420	1,570	1,470	290	1,380	1,650	1,550	265	1,070	1,130	1,130	245	1,055	1,130	1,130	265

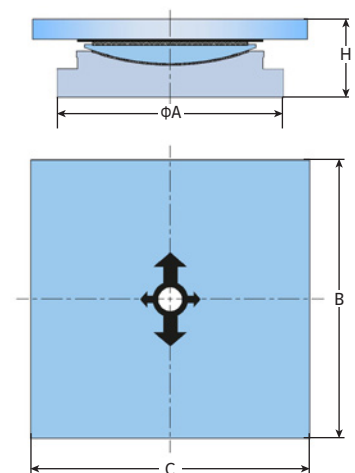
Dimensions in mm



Bearings with $\pm 200\text{mm}$ longitudinal and $\pm 20\text{mm}$ transverse movement

	PTFE								Isoslide®							
	EN				AASHTO				EN				AASHTO			
	ΦA	B	C	H	ΦA	B	C	H	ΦA	B	C	H	ΦA	B	C	H
GL 500 - 400 . 40	175	600	200	85	195	620	220	75	165	590	190	95	165	590	190	85
GL 1,000 - 400 . 40	220	650	250	95	250	680	280	85	170	590	200	100	170	590	200	85
GL 1,500 - 400 . 40	250	680	280	95	295	730	330	90	195	620	220	100	195	620	220	90
GL 2,000 - 400 . 40	280	720	320	105	330	770	370	95	215	640	240	100	215	640	240	90
GL 2,500 - 400 . 40	305	740	340	105	360	810	410	100	235	670	270	100	235	670	270	90
GL 3,000 - 400 . 40	330	770	370	110	385	830	430	110	250	680	280	105	255	680	280	95
GL 4,000 - 400 . 40	370	820	420	120	435	890	490	115	280	720	320	105	295	720	320	105
GL 5,000 - 400 . 40	420	870	470	130	480	940	540	120	315	750	360	115	330	750	350	105
GL 6,000 - 400 . 40	460	910	510	135	520	980	580	135	340	780	390	120	360	780	385	115
GL 8,000 - 400 . 40	540	990	590	145	590	1,060	660	140	400	830	450	125	415	830	445	130
GL 10,000 - 400 . 40	610	1,060	660	155	655	1,140	740	150	450	870	505	135	465	870	500	145
GL 12,000 - 400 . 40	675	1,120	720	165	710	1,200	800	160	500	910	550	145	510	910	540	145
GL 16,000 - 400 . 40	785	1,230	830	185	810	1,310	910	175	585	980	635	150	590	980	630	160
GL 20,000 - 400 . 40	880	1,330	930	200	895	1,400	1,000	195	660	1,040	710	165	660	1,040	700	170
GL 24,000 - 400 . 40	970	1,420	1,020	220	975	1,490	1,090	195	725	1,090	780	175	725	1,090	770	175
GL 28,000 - 400 . 40	1,055	1,500	1,100	235	1,045	1,570	1,170	210	790	1,150	840	195	775	1,150	830	195
GL 30,000 - 400 . 40	1,090	1,540	1,140	255	1,080	1,610	1,210	225	820	1,170	870	200	805	1,170	860	205
GL 35,000 - 400 . 40	1,180	1,630	1,230	260	1,165	1,710	1,310	225	890	1,240	940	200	875	1,240	925	225
GL 40,000 - 400 . 40	1,265	1,720	1,320	275	1,240	1,790	1,390	240	955	1,310	1,010	220	935	1,310	990	240
GL 45,000 - 400 . 40	1,345	1,800	1,400	285	1,310	1,870	1,470	260	1,015	1,370	1,070	220	995	1,370	1,050	240
GL 50,000 - 400 . 40	1,420	1,870	1,470	290	1,380	1,950	1,550	270	1,070	1,430	1,130	235	1,055	1,430	1,105	245

Dimensions in mm



The PTFE versions of the bearings above are designed with the following parameters:

Rotation = 30 mrad
Strength of concrete underneath bearing = min. 30 MPa
Strength of concrete above bearing = min. 30 MPa

The Isoslide® versions of the bearings above are designed with the following parameters:

Rotation = 30 mrad
Strength of concrete underneath bearing = min. 50 MPa
Strength of concrete above bearing = min. 50 MPa

Bearings with larger loads or strokes, or with different bearing conditions, can be designed on request.

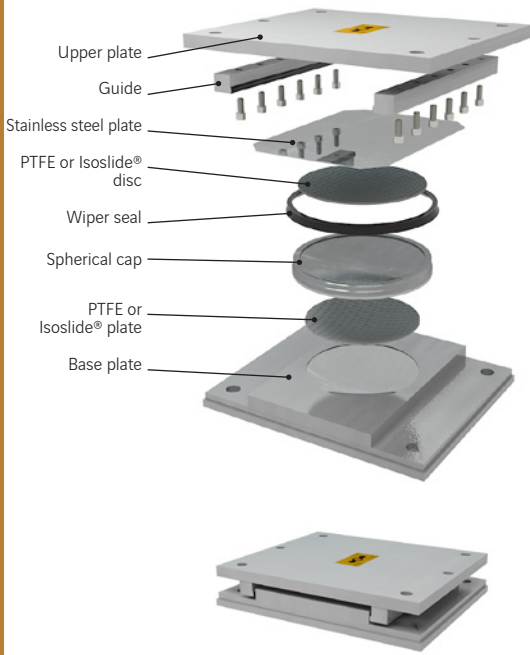


TETRON SB GG SPHERICAL BEARINGS

The spherical bearing is designed like a free sliding bearing, but with a guide. The guide is generally secure to the upper sliding plate, and abuts against the edges of the base plate.

This bearing model accepts horizontal movement along the axis of the guide and horizontal loads in the perpendicular direction.

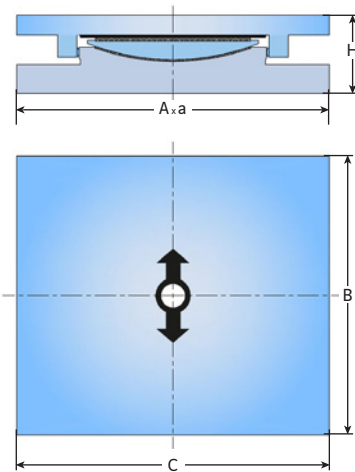
Bearings with horizontal load = 10% of vertical load and ± 50 mm movement



	PTFE										Isoslide®									
	EN					AASHTO					EN					AASHTO				
	A	a	B	C	H	A	a	B	C	H	A	a	B	C	H	A	a	B	C	H
GG 500 - 50 - 100	175	185	300	315	110	195	204	320	335	110	165	165	280	295	115	165	170	280	300	120
GG 1,000 - 100 - 100	220	240	350	370	115	250	274	380	405	115	170	180	290	310	120	170	175	290	305	120
GG 1,500 - 150 - 100	250	275	380	415	125	295	334	430	475	120	195	205	330	345	125	195	204	320	345	120
GG 2,000 - 200 - 100	280	310	420	450	125	330	374	470	525	140	215	235	340	385	125	215	239	340	390	125
GG 2,500 - 250 - 100	305	345	440	495	130	360	414	510	575	140	235	260	370	410	130	235	269	370	420	130
GG 3,000 - 300 - 100	330	380	470	540	135	385	444	530	615	140	250	275	380	435	135	255	274	380	435	135
GG 4,000 - 400 - 100	380	425	520	595	145	445	504	590	675	145	285	305	410	475	135	295	304	410	485	140
GG 5,000 - 500 - 100	430	470	560	640	155	480	559	640	740	150	315	345	440	515	150	330	344	440	515	140
GG 6,000 - 600 - 100	475	510	590	690	160	520	609	680	790	160	350	365	470	545	155	360	369	470	550	145
GG 8,000 - 800 - 100	555	595	670	775	180	590	694	760	895	170	410	415	530	585	155	415	419	530	600	155
GG 10,000 - 1,000 - 100	625	655	720	845	185	650	769	830	960	175	470	465	620	655	170	470	464	620	655	165
GG 12,000 - 1,200 - 100	690	715	780	905	185	710	844	900	1,045	195	570	515	720	705	185	560	514	710	705	185
GG 16,000 - 1,600 - 100	805	815	870	1,035	215	810	964	1,010	1,185	220	600	600	720	820	210	590	589	720	810	195
GG 20,000 - 2,000 - 100	905	915	960	1,135	230	895	1,069	1,100	1,300	235	700	675	850	895	215	700	659	850	880	205
GG 24,000 - 2,400 - 100	995	1,020	1,050	1,250	245	975	1,169	1,190	1,400	240	810	745	950	980	235	800	719	950	970	235
GG 28,000 - 2,800 - 100	1,075	1,110	1,140	1,350	260	1,050	1,264	1,280	1,505	245	810	810	950	1,070	245	800	779	950	1,030	235
GG 30,000 - 3,000 - 100	1,115	1,140	1,170	1,400	270	1,085	1,289	1,310	1,560	260	850	840	1,000	1,100	260	850	809	1,000	1,070	250
GG 35,000 - 3,500 - 100	1,210	1,240	1,270	1,500	275	1,175	1,399	1,410	1,660	265	990	910	1,140	1,170	270	990	879	1,140	1,140	260
GG 40,000 - 4,000 - 100	1,300	1,340	1,350	1,630	290	1,260	1,494	1,490	1,775	290	1,000	975	1,150	1,265	275	1,000	944	1,150	1,245	275
GG 45,000 - 4,500 - 100	1,400	1,440	1,440	1,740	315	1,340	1,579	1,570	1,880	305	1,070	1,035	1,220	1,335	295	1,060	1,004	1,210	1,305	285
GG 50,000 - 5,000 - 100	1,455	1,520	1,510	1,830	320	1,410	1,669	1,650	1,980	320	1,170	1,095	1,320	1,405	310	1,170	1,059	1,320	1,370	310

Dimensions in mm

Bearings with horizontal load = 30% of vertical load and ± 200 mm movement



	PTFE										Isoslide®									
	EN					AASHTO					EN					AASHTO				
	A	a	B	C	H	A	a	B	C	H	A	a	B	C	H	A	a	B	C	H
GG 500 - 150 . 400	175	185	600	315	125	195	204	620	335	125	165	165	590	325	130	165	169	590	310	135
GG 1,000 - 300 . 400	220	240	650	390	135	250	274	680	425	130	170	185	600	345	135	170	179	600	340	135
GG 1,500 - 450 . 400	250	275	680	425	135	295	334	730	485	140	210	205	660	365	135	210	209	660	370	135
GG 2,000 - 600 . 400	290	310	730	470	140	330	374	770	535	150	280	235	730	395	140	280	239	730	400	135
GG 2,500 - 750 . 400	360	345	810	505	145	360	414	810	585	160	350	260	800	420	145	350	269	800	440	150
GG 3,000 - 900 . 400	420	380	870	560	155	440	444	890	625	160	420	275	870	455	155	425	274	870	445	150
GG 4,000 - 1,200 . 400	490	430	940	680	170	510	504	950	685	175	500	310	950	500	165	480	309	930	490	165
GG 5,000 - 1,500 . 400	530	470	980	680	180	530	559	980	770	180	530	355	980	565	185	555	344	980	545	175
GG 6,000 - 1,800 . 400	630	510	1,080	720	185	630	609	1,080	820	185	630	390	1,080	600	185	665	369	1,080	580	175
GG 8,000 - 2,400 . 400	750	590	1,200	820	210	850	694	1,300	905	205	850	450	1,300	660	200	850	434	1,290	645	190
GG 10,000 - 3,000 . 400	840	670	1,290	900	220	900	759	1,350	990	220	850	505	1,300	745	210	850	489	1,300	730	215
GG 12,000 - 3,600 . 400	1,010	740	1,460	980	235	1,010	834	1,460	1,085	240	850	565	1,300	815	240	850	544	1,300	795	240
GG 16,000 - 4,800 . 400	1,130	860	1,580	1,120	265	1,120	954	1,570	1,215	270	1,120	660	1,570	920	270	1,140	639	1,570	900	270
GG 20,000 - 6,000 . 400	1,210	970	1,660	1,270	290	1,210	1,049	1,660	1,350	295	1,200	740	1,650	1,060	295	1,200	714	1,650	1,025	295
GG 24,000 - 7,200 . 400	1,280	1,060	1,730	1,380	315	1,280	1,149	1,730	1,480	320	1,300	805	1,750	1,135	300	1,300	779	1,750	1,110	295
GG 28,000 - 8,400 . 400	1,370	1,160	1,820	1,520	340	1,360	1,234	1,810	1,585	325	1,320	880	1,770	1,230	320	1,320	844	1,770	1,195	320
GG 30,000 - 9,000 . 400	1,400	1,190	1,850	1,550	340	1,405	1,269	1,850	1,630	350	1,400	900	1,850	1,250	320	1,400	874	1,850	1,225	320
GG 35,000 - 10,500 . 400	1,510	1,290	1,960	1,670	365	1,520	1,379	1,960	1,760	375	1,510	980	1,960	1,350	345	1,510	944	1,960	1,315	350
GG 40,000 - 12,000 . 400	1,750	1,380	2,220	1,790	395	1,570	1,464	2,000	1,865	400	1,570	1,050	2,020	1,460	375	1,570	1,014	2,020	1,425	375
GG 45,000 - 13,500 . 400	1,750	1,470	2,200	1,880	395	1,775	1,554	2,200	1,965	405	1,620	1,120	2,070	1,560	400	1,620	1,079	2,070	1,530	405
GG 50,000 - 15,000 . 400	1,920	1,570	2,370	1,990	420	1,790	1,644	2,210	2,075	435	1,750	1,180	2,200	1,620	405	1,750	1,139	2,200	1,580	420

Dimensions in mm

Bearings with larger loads or strokes, or with different bearing conditions, can be designed on request.

The PTFE versions of the bearings above are designed with the following parameters:

*Rotation = 30 mrad
Strength of concrete underneath bearing = min. 30 MPa
Strength of concrete above bearing = min. 30 MPa*

The Isoslide® versions of the bearings above are designed with the following parameters:

*Rotation = 30 mrad
Strength of concrete underneath bearing = min. 50 MPa
Strength of concrete above bearing = min. 50 MPa*

TETRON SB FX SPHERICAL BEARINGS



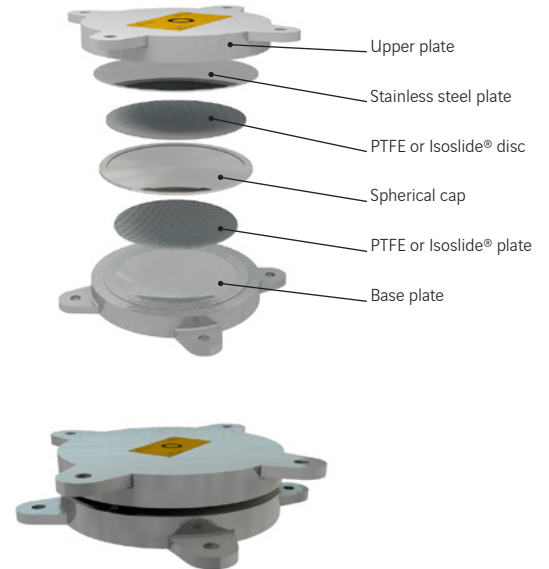
Fixed spherical bearings are made up of a base plate, a chrome-plated spherical cap, a PTFE or Isoslide® plate and an upper plate. The base plate is fixed to the support and the upper plate is fixed to the superstructure.

This model does not allow any horizontal movement. It therefore transfers the loads from the superstructure to its support in all directions.

Bearings with horizontal load = 10% of vertical load

	PTFE						Isoslide®					
	EN			AASHTO			EN			AASHTO		
	ΦA	ΦD	H	ΦA	ΦD	H	ΦA	ΦD	H	ΦA	ΦD	H
FX 500 - 50	225	225	85	235	235	95	225	225	90	215	215	95
FX 1,000 - 100	275	275	95	305	305	95	235	235	90	230	230	105
FX 1,500 - 150	310	310	100	355	355	105	260	260	100	265	265	105
FX 2,000 - 200	335	335	110	395	395	115	275	275	105	285	285	105
FX 2,500 - 250	370	370	120	440	440	125	290	290	120	315	315	105
FX 3,000 - 300	405	405	125	470	470	125	310	310	120	335	335	125
FX 4,000 - 400	450	450	140	530	530	140	355	355	130	370	370	140
FX 5,000 - 500	505	505	150	585	585	150	385	385	145	410	410	140
FX 6,000 - 600	565	565	150	635	635	165	420	420	145	440	440	140
FX 8,000 - 800	635	635	170	730	730	190	485	485	160	500	500	165
FX 10,000 - 1,000	710	710	190	815	815	200	540	540	170	550	550	165
FX 12,000 - 1,200	775	775	200	890	890	215	590	590	175	595	595	175
FX 16,000 - 1,600	910	910	215	1,030	1,030	240	680	680	195	680	680	210
FX 20,000 - 2,000	1,000	1,000	240	1,145	1,145	245	760	760	220	750	750	220
FX 24,000 - 2,400	1,100	1,100	255	1,245	1,245	270	835	835	240	835	835	235
FX 28,000 - 2,800	1,185	1,185	275	1,350	1,350	295	900	900	250	910	910	255
FX 30,000 - 3,000	1,225	1,225	280	1,395	1,395	295	935	935	250	925	925	265
FX 35,000 - 3,500	1,320	1,320	295	1,500	1,500	320	1,000	1,000	270	1,000	1,000	280
FX 40,000 - 4,000	1,415	1,415	315	1,610	1,610	350	1,075	1,075	285	1,065	1,065	305
FX 45,000 - 4,500	1,500	1,500	350	1,705	1,705	365	1,135	1,135	305	1,130	1,130	315
FX 50,000 - 5,000	1,580	1,580	350	1,805	1,805	380	1,195	1,195	310	1,185	1,185	330

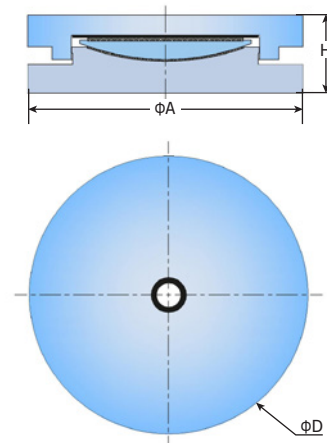
Dimensions in mm



Bearings with horizontal load = 30% of vertical load

	PTFE						Isoslide®					
	EN			AASHTO			EN			AASHTO		
	ΦA	ΦD	H	ΦA	ΦD	H	ΦA	ΦD	H	ΦA	ΦD	H
FX 500 - 150	225	225	100	255	255	95	235	235	95	230	230	95
FX 1,000 - 300	285	285	120	330	330	115	255	255	110	255	255	125
FX 1,500 - 450	345	345	135	380	380	130	270	270	125	295	295	135
FX 2,000 - 600	395	395	150	430	430	130	310	310	140	320	320	140
FX 2,500 - 750	435	435	160	480	480	150	340	340	140	350	350	140
FX 3,000 - 900	475	475	165	515	515	155	370	370	150	380	380	155
FX 4,000 - 1,200	540	540	175	580	580	170	420	420	155	420	420	165
FX 5,000 - 1,500	605	605	195	640	640	175	465	465	180	465	465	175
FX 6,000 - 1,800	665	665	205	695	695	200	510	510	180	500	500	190
FX 8,000 - 2,400	765	765	220	800	800	220	580	580	190	565	565	205
FX 10,000 - 3,000	855	855	245	895	895	235	650	650	215	630	630	230
FX 12,000 - 3,600	930	930	270	980	980	255	705	705	235	683	683	245
FX 16,000 - 4,800	1,070	1,070	285	1,130	1,130	295	860	860	270	785	785	275
FX 20,000 - 6,000	1,195	1,195	320	1,260	1,260	310	920	920	295	910	910	310
FX 24,000 - 7,200	1,315	1,315	355	1,375	1,375	345	985	985	320	980	980	320
FX 28,000 - 8,400	1,420	1,420	375	1,485	1,485	370	1,090	1,090	335	1,050	1,050	360
FX 30,000 - 9,000	1,475	1,475	375	1,540	1,540	375	1,105	1,105	365	1,085	1,085	375
FX 35,000 - 10,500	1,590	1,590	415	1,655	1,655	405	1,190	1,190	400	1,190	1,190	405
FX 40,000 - 12,000	1,695	1,695	450	1,770	1,770	425	1,325	1,325	410	1,285	1,285	430
FX 45,000 - 13,500	1,790	1,790	480	1,875	1,875	460	1,420	1,420	435	1,365	1,365	455
FX 50,000 - 15,000	1,910	1,910	480	1,985	1,985	465	1,670	1,670	450	1,440	1,440	480

Dimensions in mm



The PTFE versions of the bearings above are designed with the following parameters:

Rotation = 30 mrad
Strength of concrete underneath bearing = min. 30 MPa
Strength of concrete above bearing = min. 30 MPa

The Isoslide® versions of the bearings above are designed with the following parameters:

Rotation = 30 mrad
Strength of concrete underneath bearing = min. 50 MPa
Strength of concrete above bearing = min. 50 MPa

Bearings with larger loads or strokes, or with different bearing conditions, can be designed on request.