

psl[®] thin-section bearings

Brief Overview of Production Program



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thyssenkrupp

What are thin-section bearings?

thyssenkrupp rothe erde Slovakia thin-section bearings, also known as slim bearings, are precision-engineered bearings with extremely thin cross-sections. They are specialized bearings designed for applications where space is limited and weight requirements are stringent.

These bearings are designed to operate in space-constrained applications where conventional bearings cannot fit, offering significant advantages in weight reduction, space savings, and overall system performance.

Thin-section bearings feature a unique thin-walled structure that allows them to provide high performance and high precision even when the space and weight restrictions are required.

Thin-section bearings can meet highly demanding and specific requirements. They are often used in applications such as aerospace, medical systems, semiconductor manufacturing, robotics, astronomy instrumentation and machine tools.



Slim Bearings

Characteristics

- ➞ Specialized bearings designed for applications where space is limited and weight requirements are stringent and where conventional bearings cannot fit.
- ➞ Small cross-sections relative to diameters which allows to offer smaller design envelope and lower mass, while achieving high rigidity and running accuracy.
- ➞ Bearings dedicated for light and medium duty with slow and incremental movement. Their thin cross-section design allows the bearings to be installed into less dimensioned structures.
- ➞ Available in three configurations as angular contact ball bearings (Type A), deep groove ball bearings (Type C) and four-point contact ball bearings (Type X). Each of these designs is available in various series. The series correspond to constant cross-section size with matched ball size.
- ➞ Designs with extremely small, predominantly square cross-sections. Within each series, the cross-section remains constant even in the case of larger shaft and housing bore diameters. The bearings are therefore also described as constant section (CS) bearings. This feature distinguishes thin-section bearings from the conventional bearings that are described in standardized ISO series.
- ➞ In this way, a larger cross-section can be selected in a graduated manner and, thus, a bearing with high load-carrying capacity can be used without the need to increase the shaft diameter. Thin-section bearings can be used to achieve extremely light and compact designs.
- ➞ Thin cross-section which enables weight savings on larger diameter sizes.

psl® thin-section bearings

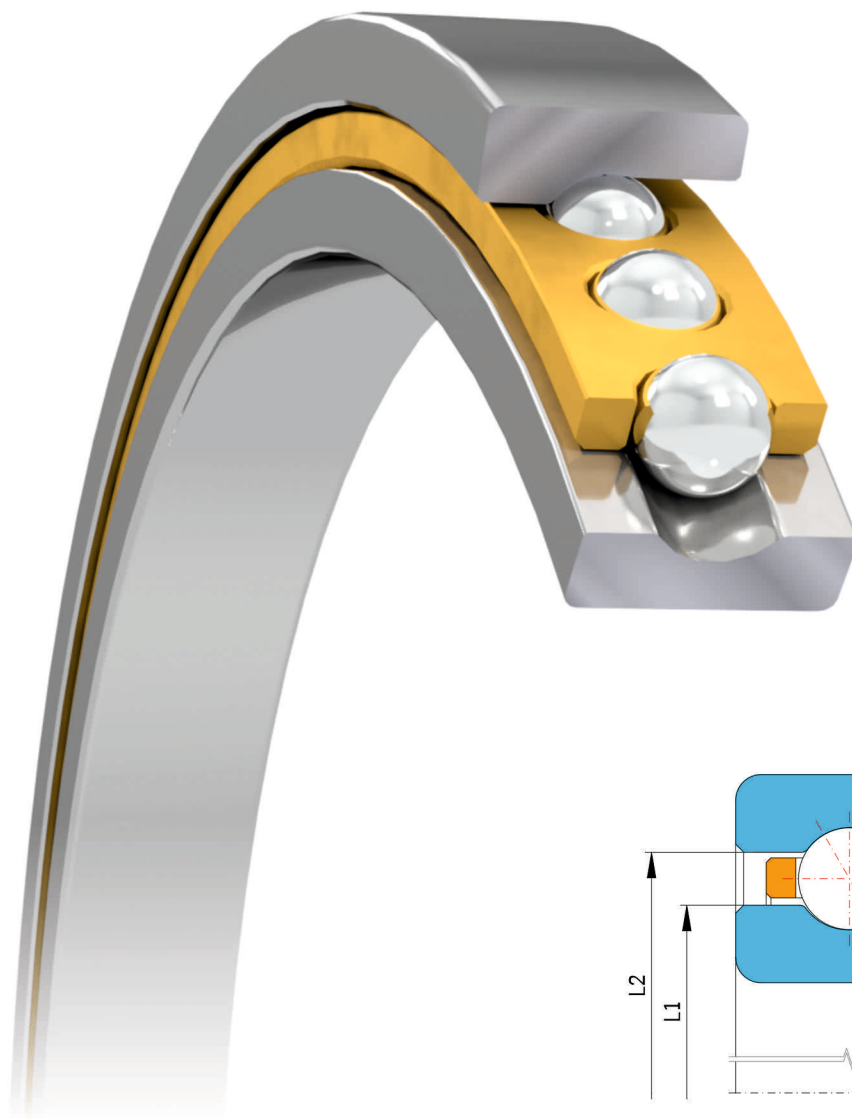
Excellence in customized bearing production

thyssenkrupp rothe erde Slovakia, a.s. Považská Bystrica is a renowned bearing manufacturer. Our trademark psl® is globally recognised as a mark of quality and reliability among customers in various industrial sectors.

We are a major producer of standard and special bearings. Our products have proven their reliability for over 75 years in a wide range of applications and throughout our long successful history, we have kept pushing the boundaries of possibility.

psl[®] thin-section bearings

Angular contact (Type A)



Main Characteristics

The Type A, angular contact ball bearing is designed to be used in applications with high axial loads in one direction. This bearing also works well in radial or combined radial-thrust applications. The Type A bearing should never be used alone to support moment loads or reversing axial loading.

We can provide you with standard series dimensions ranging for cross section from 3/8" (9,53mm) up to 1" (25,4mm) and the bore diameter from 5,5" (140mm) up to 60" (1500mm) with corresponding ball sizes and cages with pocket design.

But as well we offer tailor-made solutions engineered to meet your precise application dimensions and requirements.

Dimensional series: 3/8"; ball 3/16"

B (Bore)	D (Outside dia.)	Land Diameters			Load Ratings (capacities)				Weight [lbs]	Bearing Designation
					Dynamic		Static			
		L1	L2	L3	Radial	Thrust	Radial	Thrust		
[inch]	[inch]	[inch]	[inch]	[inch]	[lbs]	[lbs]	[lbs]	[lbs]	[lbs]	
8	8,75	8,277	8,473	8,548	1 669	4 606	4 951	14 282	0,84	PSLKC080AR0
9	9,75	9,277	9,473	9,546	1 762	4 888	5 523	15 931	0,98	PSLKC090AR0
10	10,75	10,277	10,473	10,544	1 868	5 171	6 142	17 732	1,04	PSLKC100AR0
11	11,75	11,277	11,473	11,542	1 976	5 449	6 720	19 391	1,14	PSLKC110AR0
12	12,75	12,277	12,473	12,54	2 075	5 707	7 290	21 042	1,23	PSLKC120AR0
14	14,75	14,277	14,473	14,535	2 279	6 224	8 491	24 501	1,43	PSLKC140AR0
16	16,75	16,277	16,473	16,529	2 466	6 730	9 681	27 950	1,63	PSLKC160AR0
18	18,75	18,277	18,473	18,523	2 646	7 280	10 881	31 411	1,83	PSLKC180AR0
20	20,75	20,277	20,473	20,517	2 806	7 781	12 030	34 721	2,03	PSLKC200AR0

Dimensional series: 1/2"; ball 1/4"

B (Bore)	D (Outside dia.)	Land Diameters			Load Ratings (capacities)				Weight [lbs]	Bearing Designation
					Dynamic		Static			
		L1	L2	L3	Radial	Thrust	Radial	Thrust		
[inch]	[inch]	[inch]	[inch]	[inch]	[lbs]	[lbs]	[lbs]	[lbs]	[lbs]	
8	9	8,370	8,630	8,734	2 626	6 514	6 715	19 380	1,5	PSLKD080ARO
9	10	9,370	9,630	9,732	2 778	7 014	7 501	21 661	1,7	PSLKD090ARO
10	11	10,370	10,630	10,732	2 938	7 500	8 293	23 942	1,9	PSLKD100ARO
11	12	11,370	11,630	11,73	3 070	7 961	9 082	26 222	2,1	PSLKD110ARO
12	13	12,370	12,630	12,728	3 213	8 424	9 870	28 501	2,2	PSLKD120ARO
14	15	14,370	14,630	14,724	3 462	9 291	11 451	33 061	2,6	PSLKD140ARO
16	17	16,370	16,630	16,718	3 741	10 131	13 030	37 620	2,9	PSLKD160ARO
18	19	18,370	18,630	18,712	4 006	10 932	14 611	42 180	3,3	PSLKD180ARO
20	21	20,370	20,630	20,705	4 258	11 711	16 190	46 741	3,7	PSLKD200ARO
21	22	21,370	21,630	21,700	4 334	12 087	16 981	49 022	3,8	PSLKD210ARO

Dimensional series: 3/4"; ball 3/8"

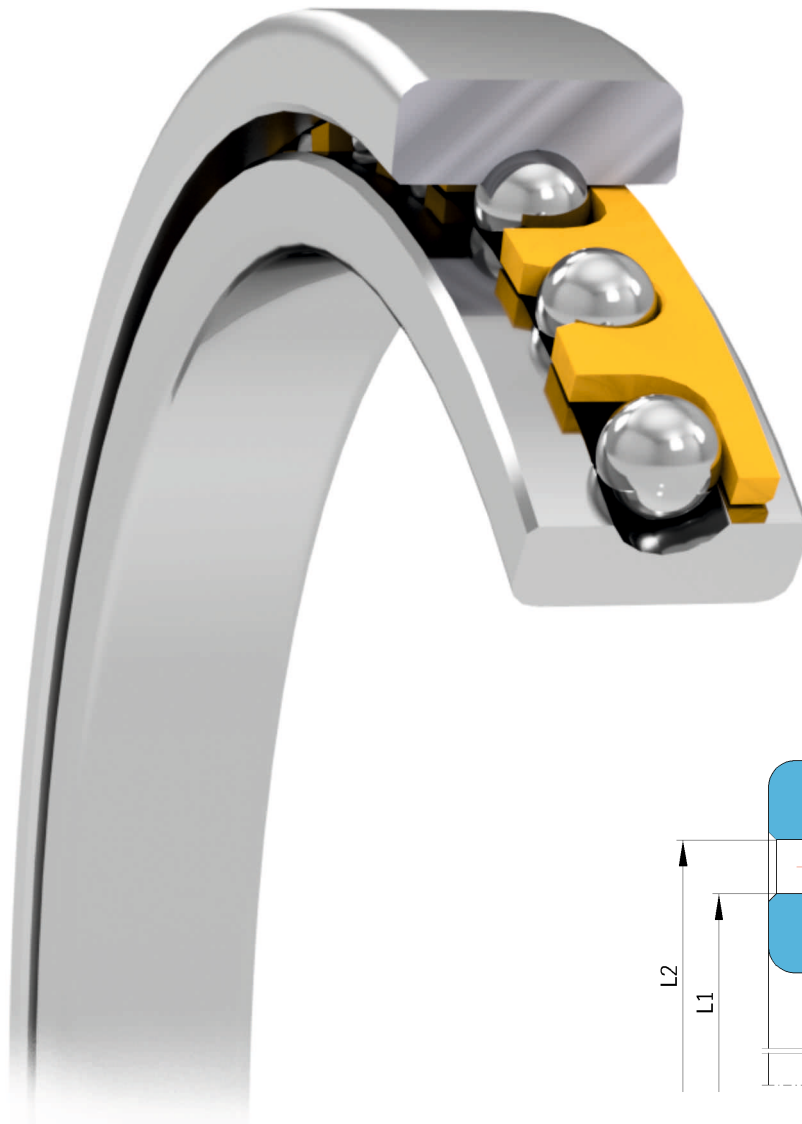
B (Bore)	D (Outside dia.)	Land Diameters			Load Ratings (capacities)				Weight [lbs]	Bearing Designation
					Dynamic		Static			
		L1	L2	L3	Radial	Thrust	Radial	Thrust		
[inch]	[inch]	[inch]	[inch]	[inch]	[lbs]	[lbs]	[lbs]	[lbs]	[lbs]	
8	9,5	8,555	8,945	9,110	5 052	12 670	11 731	33 862	3,6	PSLKF080AR0
9	10,5	9,555	9,945	10,108	5 380	13 700	13 190	38 090	4,0	PSLKF090AR0
10	11,5	10,555	10,945	11,106	5 633	14 531	14 420	41 620	4,4	PSLKF100AR0
11	12,5	11,555	11,945	12,106	5 943	15 503	15 881	45 851	4,8	PSLKF110AR0
12	13,5	12,555	12,945	13,104	6 205	16 292	17 100	49 381	5,2	PSLKF120AR0
14	15,5	14,555	14,945	15,102	6 769	17 951	19 791	57 141	5,8	PSLKF140AR0
16	17,5	16,555	16,945	17,098	7 299	19 542	22 481	64 890	6,8	PSLKF160AR0
18	19,5	18,555	18,945	19,096	7 852	21 211	25 411	73 361	7,7	PSLKF180AR0
20	21,5	20,555	20,945	21,092	8 329	22 682	28 101	81 121	8,5	PSLKF200AR0

Dimensional series: 1"; ball 1/2"

B (Bore)	D (Outside dia.)	Land Diameters			Load Ratings (capacities)				Weight [lbs]	Bearing Designation
					Dynamic		Static			
		L1	L2	L3	Radial	Thrust	Radial	Thrust		
[inch]	[inch]	[inch]	[inch]	[inch]	[lbs]	[lbs]	[lbs]	[lbs]	[lbs]	
8	10	8,742	9,258	9,485	8 454	20 181	17 063	49 250	6,5	PSLKG080ARO
9	11	9,742	10,258	10,485	8 924	21 644	18 961	54 722	7,2	PSLKG090ARO
10	12	10,742	11,258	11,483	9 370	23 062	20 852	60 191	8,0	PSLKG100ARO
11	13	11,742	12,258	12,481	9 807	24 443	22 751	65 661	8,7	PSLKG110ARO
12	14	12,742	13,258	13,481	10 215	25 784	24 640	71 142	9,5	PSLKG120ARO
14	16	14,742	15,258	15,478	10 977	28 361	28 430	82 081	10,9	PSLKG140ARO
16	18	16,742	17,258	17,474	11 728	30 832	32 221	93 021	12,4	PSLKG160ARO
18	20	18,742	19,258	19,472	12 433	33 201	36 020	104 001	13,8	PSLKG180ARO
20	22	20,742	21,258	21,468	13 175	35 491	39 811	114 901	15,2	PSLKG200ARO
22	24	22,742	23,258	23,468	13 688	37 712	43 600	125 857	16,6	PSLKG220ARO

psl[®] thin-section bearings

Radial contact (Type C)



Main Characteristics

The Type C, radial contact ball bearing is designed with deep ball grooves to withstand high radial loads. Although this bearing is used primarily in applications with radial loads, it can withstand moderate reversing axial loads.

Same as by the angular contact bearings the radial contact bearings can be provided with standard series dimensions ranging for cross section from 3/8" (9,53mm) up to 1" (25,4mm) and the bore diameter from 5,5" (140mm) up to 60" (1500mm) with corresponding ball sizes and cages with pocket design.

But as well we offer tailor-made solutions engineered to meet your precise application dimensions and requirements.

Dimensional series: 3/8"; ball 3/16"

B (Bore)	D (Outside dia.)	Land Diameters		Load Ratings (capacities)		Weight	Bearing Designation
				Radial			
		L1	L2	Dynamic	Static		
[inch]	[inch]	[inch]	[inch]	[lbs]	[lbs]	[lbs]	
8	8,75	8,277	8,473	1 528	4 031	0,8	PSLKC080CP0
9	9,75	9,277	9,473	1 628	4 512	0,9	PSLKC090CP0
10	10,75	10,277	10,473	1 711	4 990	1,1	PSLKC100CP0
11	11,75	11,277	11,473	1 809	5 471	1,2	PSLKC110CP0
12	12,75	12,277	12,473	1 907	5 952	1,3	PSLKC120CP0
14	14,75	14,277	14,473	2 087	6 911	1,5	PSLKC140CP0
16	16,75	16,277	16,473	2 258	7 880	1,7	PSLKC160CP0
18	18,75	18,277	18,473	2 420	8 841	1,9	PSLKC180CP0
20	20,75	20,277	20,473	2 574	9 801	2,2	PSLKC200CP0

Dimensional series: 1/2"; ball 1/4"

B (Bore)	D (Outside dia.)	Land Diameters		Load Ratings (capacities)		Weight	Bearing Designation
				Radial			
		L1	L2	Dynamic	Static		
[inch]	[inch]	[inch]	[inch]	[lbs]	[lbs]	[lbs]	
8	9	8,37	8,63	2 510	5 811	1,5	PSLKD080CP0
9	10	9,37	9,63	2 662	6 501	1,7	PSLKD090CP0
10	11	10,37	10,63	2 798	7 181	1,9	PSLKD100CP0
11	12	11,37	11,63	2 937	7 871	2,1	PSLKD110CP0
12	13	12,37	12,63	3 084	8 553	2,3	PSLKD120CP0
14	15	14,37	14,63	3 319	9 921	2,7	PSLKD140CP0
16	17	16,37	16,63	3 576	11 291	3,1	PSLKD160CP0
18	19	18,37	18,63	3 826	12 651	3,5	PSLKD180CP0
20	21	20,37	20,63	4 066	14 020	3,9	PSLKD200CP0
21	22	21,37	21,63	4 136	14 706	4,0	PSLKD210CP0

Dimensional series: 3/4"; ball 3/8"

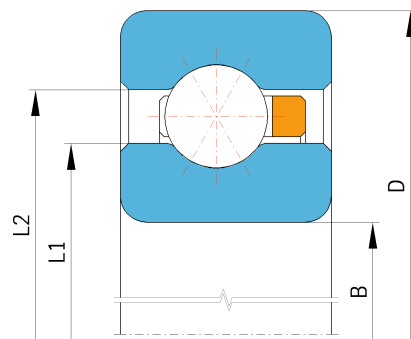
B (Bore)	D (Outside dia.)	Land Diameters		Load Ratings (capacities)		Weight	Bearing Designation
				Radial			
		L1	L2	Dynamic	Static		
[inch]	[inch]	[inch]	[inch]	[lbs]	[lbs]	[lbs]	
8	9,5	8,555	8,945	4 730	9 882	3,5	PSLKF080CP0
9	10,5	9,555	9,945	5 009	11 001	3,9	PSLKF090CP0
10	11,5	10,555	10,945	5 272	12 133	4,3	PSLKF100CP0
11	12,5	11,555	11,945	5 558	13 260	4,8	PSLKF110CP0
12	13,5	12,555	12,945	5 832	14 390	5,2	PSLKF120CP0
14	15,5	14,555	14,945	6 351	16 650	6,0	PSLKF140CP0
16	17,5	16,555	16,945	6 847	18 901	7,1	PSLKF160CP0
18	19,5	18,555	18,945	7 312	21 161	7,9	PSLKF180CP0
20	21,5	20,555	20,945	7 758	23 420	8,9	PSLKF200CP0

Dimensional series: 1"; ball 1/2"

B (Bore)	D (Outside dia.)	Land Diameters		Load Ratings (capacities)		Weight	Bearing Designation
				Radial			
		L1	L2	Dynamic	Static		
[inch]	[inch]	[inch]	[inch]	[lbs]	[lbs]	[lbs]	
8	10	8,742	9,258	8 076	14 771	6,5	PSLKG080CP0
9	11	9,742	10,258	8 538	16 421	7,2	PSLKG090CP0
10	12	10,742	11,258	8 957	18 063	7,9	PSLKG100CP0
11	13	11,742	12,258	9 362	19 701	8,6	PSLKG110CP0
12	14	12,742	13,258	9 759	21 342	9,3	PSLKG120CP0
14	16	14,742	15,258	10 510	24 621	10,8	PSLKG140CP0
16	18	16,742	17,258	11 216	27 911	12,3	PSLKG160CP0
18	20	18,742	19,258	11 899	31 191	13,7	PSLKG180CP0
20	22	20,742	21,258	12 603	34 470	15,8	PSLKG200CP0
22	24	22,742	23,258	13 033	37 757	16,8	PSLKG220CP0

psl[®] thin-section bearings

4-point contact (Type X)



Main Characteristics

The Type X, or 4-point contact, ball bearing is ideal for moment loading. Type X bearings are designed with gothic arch raceways creating 4 contact points between the balls and the raceways. This design is excellent for moment loading and reversing axial loading. The Type X bearing can be used for other light loading conditions, but is not recommended in place of the Type C or Type A bearing for pure radial or axial loads.

Same as by the angular contact bearings the 4-point contact bearings can be provided with standard series dimensions ranging for cross section from 3/8" (9,53mm) up to 1" (25,4mm) and the bore diameter from 5,5" (140mm) up to 60" (1500mm) with corresponding ball sizes and cages with pocket design.

But as well we offer tailor-made solutions engineered to meet your precise application dimensions and requirements.

Dimensional series: 3/8"; ball 3/16"

Dimensional Series: 370 - 1, ball 3710

B (Bore)	D (Outside dia.)	Land Diameters		Load Ratings (capacities)						Weight	Bearing Designation
				Dynamic			Static				
		L1	L2	Radial	Thrust	Moment	Radial	Thrust	Moment		
[inch]	[inch]	[inch]	[inch]	[lbs]	[lbs]	[in-lbs]	[lbs]	[lbs]	[in-lbs]	[lbs]	
8	8,75	8,277	8,473	1 843	3 463	6 267	4 031	10 071	16 871	0,84	PSLKC080XP0
9	9,75	9,277	9,473	1 976	3 677	7 517	4 512	11 272	21 131	0,94	PSLKC090XP0
10	10,75	10,277	10,473	2 100	3 931	8 855	4 990	12 471	25 881	1,06	PSLKC100XP0
11	11,75	11,277	11,473	2 221	4 183	10 272	5 471	13 682	31 111	1,16	PSLKC110XP0
12	12,75	12,277	12,473	2 339	4 422	11 763	5 952	14 883	36 831	1,25	PSLKC120XP0
14	14,75	14,277	14,473	2 559	4 891	14 973	6 911	17 280	49 691	1,52	PSLKC140XP0
16	16,75	16,277	16,473	2 768	5 331	18 454	7 880	19 691	64 480	1,73	PSLKC160XP0
18	18,75	18,277	18,473	2 964	5 761	22 192	8 841	22 091	81 191	1,94	PSLKC180XP0
20	20,75	20,277	20,473	3 152	6 170	26 171	9 801	24 501	99 831	2,16	PSLKC200XP0

Dimensional series: 1/2"; ball 1/4"

B (Bore)	D (Outside dia.)	Land Diameters		Load Ratings (capacities)						Weight	Bearing Designation
				Dynamic			Static				
		L1	L2	Radial	Thrust	Moment	Radial	Thrust	Moment		
[inch]	[inch]	[inch]	[inch]	[lbs]	[lbs]	[in-lbs]	[lbs]	[lbs]	[in-lbs]	[lbs]	
8	9	8,37	8,63	2 942	5 637	10 144	5 811	14 541	24 711	1,5	PSLKD080XP0
9	10	9,37	9,63	3 150	5 998	12 129	6 501	16 252	30 870	1,7	PSLKD090XP0
10	11	10,37	10,63	3 343	6 355	14 246	7 181	17 961	37 710	1,9	PSLKD100XP0
11	12	11,37	11,63	3 531	6 657	16 489	7 871	19 671	45 232	2,1	PSLKD110XP0
12	13	12,37	12,63	3 713	6 994	18 852	8 553	21 380	53 441	2,3	PSLKD120XP0
14	15	14,37	14,63	4 058	7 671	23 920	9 921	24 801	71 911	2,7	PSLKD140XP0
16	17	16,37	16,63	4 384	8 361	29 417	11 291	28 220	93 111	3,1	PSLKD160XP0
18	19	18,37	18,63	4 688	9 030	35 312	12 651	31 641	117 001	3,5	PSLKD180XP0
20	21	20,37	20,63	4 980	9 671	41 585	14 020	35 060	143 701	3,9	PSLKD200XP0
21	22	21,37	21,63	5 121	9 981	44 854	14 710	36 770	158 101	4	PSLKD210XP0

Dimensional series: 3/4"; ball 3/8"

Dimensional Series: 3/4" Bore 3/8" Bore											
B (Bore)	D (Outside dia.)	Land Diameters		Load Ratings (capacities)						Weight	Bearing Designation
				Dynamic			Static				
		L1	L2	Radial	Thrust	Moment	Radial	Thrust	Moment		
[inch]	[inch]	[inch]	[inch]	[lbs]	[lbs]	[in-lbs]	[lbs]	[lbs]	[in-lbs]	[lbs]	
8	9,5	8,555	8,945	5 724	10 570	20 291	9 882	24 691	43 200	3,5	PSLKF080XP0
9	10,5	9,555	9,945	6 101	11 231	24 110	11 001	27 511	53 643	3,9	PSLKF090XP0
10	11,5	10,555	10,945	6 466	11 883	28 177	12 133	30 333	65 212	4,3	PSLKF100XP0
11	12,5	11,555	11,945	6 816	12 493	32 474	13 260	33 153	77 911	4,8	PSLKF110XP0
12	13,5	12,555	12,945	7 151	13 191	36 989	14 390	35 972	91 732	5,2	PSLKF120XP0
14	15,5	14,555	14,945	7 787	14 530	46 664	16 650	41 620	122 801	6	PSLKF140XP0
16	17,5	16,555	16,945	8 392	15 821	57 134	18 901	47 261	158 301	7,1	PSLKF160XP0
18	19,5	18,555	18,945	8 959	17 061	68 346	21 161	52 901	198 401	7,9	PSLKF180XP0
20	21,5	20,555	20,945	9 502	18 251	80 262	23 420	58 550	243 001	8,9	PSLKF200XP0

Dimensional series: 1"; ball 1/2"

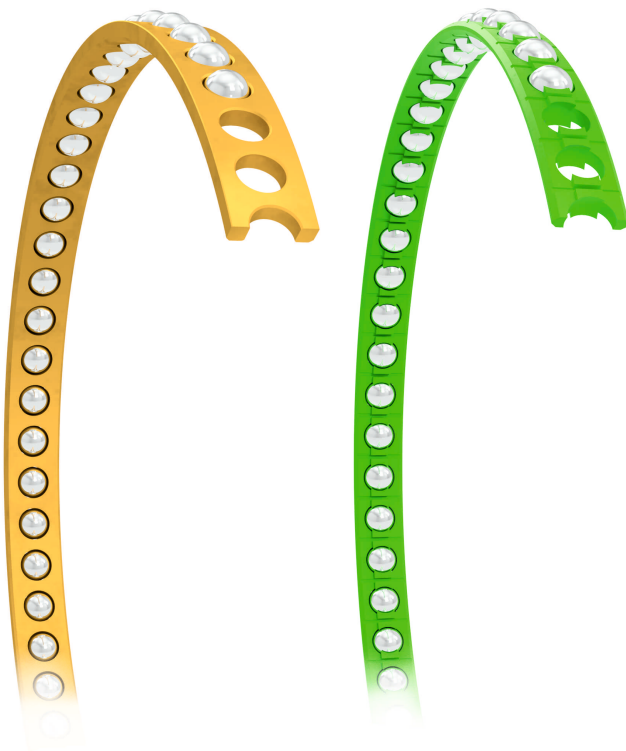
B (Bore)	D (Outside dia.)	Land Diameters		Load Ratings (capacities)						Weight	Bearing Designation
				Dynamic			Static				
		L1	L2	Radial	Thrust	Moment	Radial	Thrust	Moment		
[inch]	[inch]	[inch]	[inch]	[lbs]	[lbs]	[in-lbs]	[lbs]	[lbs]	[in-lbs]	[lbs]	
8	10	8,742	9,258	9 476	17 845	34 491	14 771	36 941	66 481	6,5	PSLKG080XP0
9	11	9,742	10,258	10 067	18 923	40 739	16 421	41 041	82 081	7,2	PSLKG090XP0
10	12	10,742	11,258	10 640	19 958	47 376	18 063	45 143	99 322	7,9	PSLKG100XP0
11	13	11,742	12,258	11 185	20 963	54 372	19 701	49 252	118 201	8,6	PSLKG110XP0
12	14	12,742	13,258	11 714	21 914	61 735	21 342	53 352	138 702	9,3	PSLKG120XP0
14	16	14,742	15,258	12 724	23 707	77 448	24 621	61 560	184 701	10,8	PSLKG140XP0
16	18	16,742	17,258	13 677	25 471	94 426	27 911	69 771	237 201	12,3	PSLKG160XP0
18	20	18,742	19,258	14 578	27 411	112 562	31 191	77 980	296 301	13,7	PSLKG180XP0
20	22	20,742	21,258	15 436	29 301	131 860	34 470	86 181	362 001	15,8	PSLKG200XP0
22	24	22,742	23,258	16 256	31 131	152 231	37 760	94 392	434 201	17,3	PSLKG220XP0

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Cage types

Pocket cage

design used in Type A
(Assembly of the cage with balls into races)

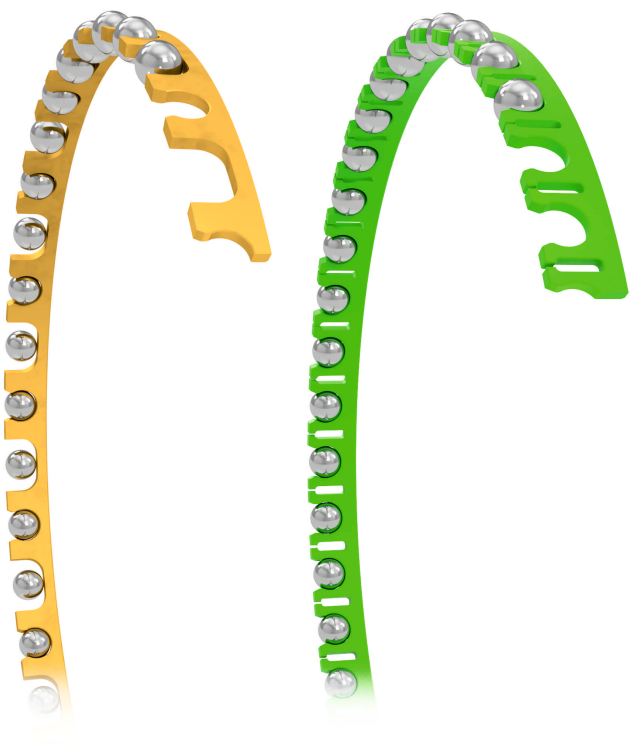


Advantages of plastic cage

- ⇒ Cost sensitive
- ⇒ Lightweight
- ⇒ Higher speeds
- ⇒ Noise reduction

Snap-in cage

design used in Type C and Type X
(Conrad assembly of the races and balls)



Advantages of brass cage

- ⇒ Higher precision applications
- ⇒ Higher loads
- ⇒ Higher temperatures
- ⇒ Chemical and corrosive resistance

psl® thin-section bearings

Applications



Medical system - X-ray scanners, computed tomography (CT), ultrasound, echocardiography, PET scanners, diagnostic equipment, fluoroscopy, surgery robots, surgery tables

Industrial machinery - robots, rotary systems, optical scanners, projectors, spinning machines, handling equipment, rotary tables

Tracking systems - radars, cameras, sonars, satellites, radio telescope

Renewable energy

