

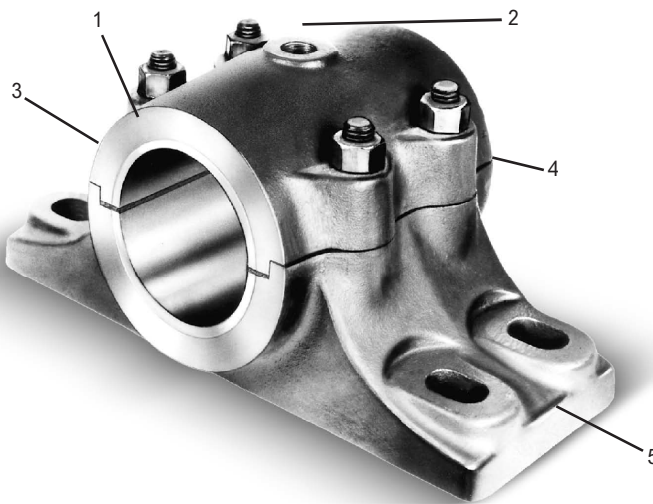
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Rigid Sleeve Bearing Units and Take-ups

Rigid sleeve bearing units provide compact and reliable usage in applications where continuous operation and uninterrupted service are required. Because the bearing material wears gradually, sudden breakdowns and costly maintenance are minimized. Sleeve bearings can also operate extremely quietly. The standard bearing materials of babbitt, bronze and cast iron will handle a wide variety of applications such as on log decks, sewage treatment equipment, furnaces and ovens, quiet operating fans and blowers, power plant dampers and stokers, oscillating shaft applications and other general conveying and power transmission machinery. Babbitt bearings are used for moderate speeds and loads and ambient temperatures up to 130°F (54°C). Babbitt has the ability to give excellent service with a minimum of maintenance.

Bronze bearings are recommended for heavier loads, impact, and temperatures beyond the limits of babbitt bearings. They can be operated at ambient temperatures up to 300°F (149°C) providing satisfactory lubrication is available. Bronze has excellent all-around bearing characteristics; it has a relatively low coefficient of friction and a remarkable resistance to shock and wear.



1. Secure Mounting

Bearing of babbitt or bronze is securely anchored in housing.

2. Lubrication

Housing is drilled and tapped for grease cup or lubrication fitting; grooves distribute lubricant over loaded area.

3. Finished Ends

Finished ends permit flush mounting of pulley, sprocket, or collar against bearing when required.

4. Two-piece Pillow Block

Two-piece pillow block has shims to provide for adjustment and compensate for wear.

5. Finished Mounting Surface

Mounting surface is finished to provide firm seating on flat support.

One-piece Pillow Blocks

One-piece pillow blocks are recommended for general applications where it is unnecessary to remove a bearing cap. They are available with babbitt, bronze or plain bore cast iron bearings.



Two-piece Pillow Blocks

Two-piece pillow blocks are used whenever a bearing with a removable cap is required. They are available with babbitt or bronze bearings.

For heavy side pressures or angular loading, housings with gibbed joints provide greater strength. Cast steel housings are used where sudden shocks or heavy impact loads are encountered.



Flanged Units

Flanged units with square flanges have slotted mounting holes to make them interchangeable with most common ball and roller bearing bolting patterns. These units have either babbitt or bronze bearings.



Nomenclature

Symbol	Description	2K	15	95	F	Z—
None	One-piece housing, cast iron					
2—	Two-piece housing, cast iron					
2K	Two-piece housing, cast steel					
10	Pillow block, one-piece, 2-bolt base					
11	Pillow block, plain iron (no sleeve)					
12	Pillow block, angle type split joint, 2-bolt base					
13	Pillow block, angle type split joint, 4-bolt base					
14	Pillow block, horizontal gibbed joint, 4-bolt base					
15	Pillow block, angle type split joint, 40° off horizontal					
F22	Flanged unit, square, 4-bolt					
DS28	Take-up, conveyor, heavy rigid frame					
DSB28	Take-up, conveyor, heavy hinged frame					
95	Shaft diameter in 16ths of an inch					
F	4-bolt base (units 1000, 1100 only)					
None	Babbitt bearing (except units 1100)					
Z	Bronze bearing					
XX	Take-up adjustment, inches					

Rigid Sleeve Bearing Units Selection Guide

To select a rigid sleeve bearing, determine the applied radial load and the applicable operating conditions. The procedure shown here will aid in selecting an appropriate bearing.

The selection procedures and rating formulas used here are in agreement with industry standards for sleeve bearings established by the Mechanical Power Transmission Association. The bearing ratings apply when certain installation and operating conditions are met and when any other adverse ambient conditions such as high or low temperatures, extreme dirt or moisture, chemical contamination, shock or vibration loading direct or induced, oscillating shafts, intermittent operation and related factors are carefully considered.

The ratings used apply when the following conditions are met:

1. Align bearings with the shaft to provide uniform load distribution.
2. Normal running loads should not exceed the ratings shown in the tables. Starting and occasional peak loads should not exceed these ratings by more than 100%.
3. The direction of the load should not be within 30° (.53 radians) of either side of the grease groove and must further meet any load direction limitations imposed by Table 1.
4. The shaft finish through the bearing bore should be at least as smooth as that of normal commercial cold finished steel shafting (about 32 micro-inches or .82µm). There should also be no machined or ground spiral lead on the shaft journal. Shafting should be within the diameter tolerances listed on the next page.
5. Ambient temperatures should not exceed 130°F (54°C) for babbitt and 300°F (149°C) for bronze bearings. This temperature limit applies to shafts extending from ovens, high temperature fans, etc.
6. Sturdy, vibration-free supporting structures must be provided, along with adequate grease lubrication.

Steps for Selection

Step 1

From Table 1, select the bearing material and housing series and material suitable for the radial load direction.

Step 2










Refer to the radial load rating tables in the Load Ratings and Speed Limits section to determine the shaft diameter necessary to obtain the required radial rating at the given speed.

If the conditions described above cannot be met, the load should be increased by a service factor prior to selecting the bearing sizes from the tables shown in the Load Ratings and Speed Limits section. The service factor may be as high as 2.0 for conditions to the left of the "stair-step" line, or as high as 3.0 for conditions to the right of the line. Consult Rexnord Bearing Division.

Step 3

To position a shaft axially or where light thrust loads are present provide thick bronze washers backed by a shaft collar or a machined shaft shoulder against the end of the bearing. The bearing ends are already machined.

Table 1 – Bearing material and unit type selection

Material		Recommended Loading Range, Degrees, Radius For Pillow Block Or Flanged Unit*		Available Shaft Sizes, inches	Rigid unit series			
					Pillow Block		Flanged Uni	
Bearing	Housing				2-bolt	4-bolt	Square	
Babbitt	Cast iron one-piece		300° 5.2 rad	1/2 - 2 15/16	1000			
				3/4 - 3 15/16		F2200		
				3 7/16 - 3 15/16		1000F		
	Cast iron two-piece		120° 2.1 rad	7/8 - 3 15/16	2-1200			
				3 7/16 - 4 15/16		2-1300		
					300° 5.2 rad	1 15/16 - 8		2-1400
					120° 2.1 rad	1 15/16 - 9		2-1500
	Bronze	Cast iron one-piece		300° 5.2 rad	1/2 - 2 15/16	1000Z		
3/4 - 3 15/16						F2200Z		
3 7/16 - 3 15/16						1000FZ		
Cast iron two-piece			120° 2.1 rad	7/8 - 3 15/16	2-1200Z			
					300° 5.2 rad	1 15/16 - 8		2-1400Z
					□ 120° 2.1 rad	1 15/16 - 8		2-1500Z
Cast steel two-piece			300° 5.2 rad	1 15/16 - 12		2K1400Z		

* Shaded portion of drawings represents recommended loading range with the grease groove horizontal and opposite the loaded area. For other positioning, consult Rexnord Bearing Division.

□ 300° (5.2 rad.) for housings with gibbed joint construction.

Additional Information

Sleeve Bearing Materials:

Plain bearings made of babbitt are universally accepted as providing reasonable capacity and dependable service, often under adverse conditions. Babbitt is a relatively soft bearing material and for this reason minimizes danger of scoring or damage to shafts or rotors. It can often be repaired quickly on the spot by rescraping, pouring of new metal, etc. Bearing operating temperature should not exceed 130°F (54°C) although occasional peaks to 200°F (93°C) may be tolerated. Babbitt bearings are usually restricted to applications involving light to moderate loads and mild shock.

Bronze bearings are suitable for heavier loads than babbitt (75% to 200% higher), depending upon specific conditions of load and speed. Bronze with stands higher shock loads and permits some what higher speed operation. It is usually restricted to 300°F (150°C) ambient temperature, although normal multi-purpose greases are limited to 200°-250°F (93°-121°C) operating temperature. Bronze is a harder material than babbitt and has a greater tendency to score or damage shafts in the event of malfunction such as lack of relubrication. Field repair of bronze bearings generally requires removing shims and scraping or replacement of bushings.

Cast iron bearings (series 1100) are low in cost and suitable for many slow moving shafts and oscillating or reciprocating arms supporting relatively light loads. The lubricating characteristics of cast iron are attributed to the free graphite flakes present in the material. With the use of cast iron bearings, higher shaft clearance is usually utilized. Thus any large wear particles or debris will not join or seize the bearing. This material has been used to temperatures as high as 1000°F (538°C) under light loads and slow speed intermittent operations, where ordinary lubricants are ineffective.

Additional Features:

By the very nature of their design, all rigid sleeve bearing units are expansion type, in that the shaft journal is free to slide axially through the bore of the bearing. To fix a unit, a combination of shaft shoulders and/or thrust collars with bronze washers can be utilized. Rigid sleeve bearing units have cored mounting bolt holes suitable for the inch or metric bolts listed.

Bearings can be replaced in units with bronze sleeves. Care should be taken when replacing bronze sleeves, split or solid, to firmly anchor the sleeve to the housing.

Operation:

Rigid sleeve bearing units are not prelubricated. The service instructions packed with shipments provide guide lines for initial lubrication and relubrication intervals. As lack of lubrication results in bearing and shaft wear, care must be taken to assure an adequate supply of correct lubricant, especially during initial startup and until satisfactory relubrication intervals are determined. Very careful shaft alignment is necessary during installation. Shaft journals must turn freely without binding in the bearing or excessive heat and seizure can result. Any factor which may disrupt or remove the lubricant film should be eliminated as well. Sharp edges on the shaft or the bearing surface can act as scrapers to destroy lubricant films. Do not extend shaft keyways into bearing bores. When rigid sleeve bearings must carry light to medium thrust loads, thrust washers of bronze should be placed against the already machined face of the bearing and backed by substantial thrust collars, shaft shoulders, machined gear, sprocket or sheave faces, etc.

Take-ups:

Rigid sleeve bearing pillow blocks can be mounted on the universal take-up frame LC, and LHD universal take-up frame. Alignment of rigid sleeve bearing take-ups is difficult and must be carefully accomplished. Alignment must also be maintained during any further adjustment of the take-up after operation. Bolt take-up frames firmly to good supporting structure to prevent frame overload and distortion.

Shaft Tolerances:

Shaft diameters for rigid sleeve bearing units are usually held to the following regular commercial tolerances:

Shaft Diameters	Recommended Tolerance
through 2"	Nominal to -.003"
2 1/16" through 4"	Nominal to -.004"
4 1/16" through 6"	Nominal to -.005"
6 1/16" through 13"	Nominal to -.006"

Warning:

The reliability built in all Link-Belt bearings can be realized in service only when bearings are correctly selected, properly installed, protected and maintained.

The correct selection of rigid sleeve bearing mounted units requires that the magnitude and nature of all loads, speeds, alignment, mounting, operating requirements and maintenance be adequately considered. The selection of materials for and design of housings, shafting, fasteners, and accessories as well as provisions for installation and maintenance must follow good engineering principles.

Housings must be selected and installed with regard to the degree and direction of the forces that will occur. Housings should not be used under tension loads except with adequate safety factors. For this reason pillow blocks are best suited to withstand radial loads passing through the base. When heavy loads or shock loads are possible, it is most important to mount a unit so that the line of force passes directly into the base, or so that the unit is directly and substantially supported other than through its mounting bolts.

Where the line of force falls outside the base, serious housing and fastener deflection or failure may occur.

Take-ups are best located where loads are moderate and no shock loads are present. As many mounting arrangements are possible with take-ups, proper safety factors must always be considered on all items of the system, including shafts, housings, fasteners, and adjusting screws. Rexnord Bearing Division, should be consulted where unusual loading conditions exist.

Load Ratings – Babbitt Rigid Sleeve Bearing Units

Radial Load Ratings for 10 to 300 RPM (pounds/newtons) * ■

Shaft Diameter, inches	Shaft Speed, RPM													
	10		50		100		150		200		250		300	
1/2	100	445	100	445	100	445	95	423	95	423	95	423	95	423
5/8	150	667	150	667	145	645	145	645	140	623	140	673	135	600
3/4	180	801	175	778	175	778	170	756	170	756	165	734	160	712
7/8	260	1 157	255	1 134	250	1 112	245	1 090	240	1 068	235	1 045	230	1 023
15/16	280	1 246	275	1 223	265	1 179	260	1 157	255	1 134	250	1 112	245	1 090
1	295	1 312	290	1 290	285	1 268	280	1 246	270	1 201	265	1 179	260	1 157
1 1/8	415	1 846	410	1 824	400	1 779	390	1 735	380	1 690	370	1 646	355	1 579
1 3/16, 1 1/4	440	1 957	430	1 913	420	1 868	410	1 824	395	1 757	385	1 713	375	1 668
1 5/16, 1 3/8	585	2 602	570	2 535	555	2 469	535	2 380	520	2 313	505	2 246	485	2 157
1 7/16, 1 1/2	640	2 847	625	2 780	605	2 691	585	2 602	565	2 513	545	2 424	525	2 335
1 11/16, 1 3/4	875	3 892	850	3 781	820	3 648	785	3 492	755	3 358	720	3 203	690	3 069
1 15/16, 2	1150	5 120	1110	4 940	1060	4 720	1010	4 490	965	4 292	915	4 070	865	3 848
2 3/16, 2 1/4	1460	6 490	1400	6 230	1330	5 920	1260	5 600	1190	5 290	1120	4 980	1050	4 670
2 7/16, 2 1/2	1800	8 010	1730	7 690	1630	7 250	1530	6 810	1430	6 360	1340	5 960	1240	5 520
2 11/16, 2 3/4	2190	9 740	2080	9 250	1950	8 670	1820	8 100	1690	7 520	1560	6 940	1150	5 120
2 15/16, 3	2600	11 570	2470	10 990	2300	10 230	2130	9 470	1960	8 720	1790	7 960	675	3 002
3 7/16, 3 1/2	3550	15 790	3330	14 810	3060	13 610	2790	12 410	2520	11 210	1200	5 340		
3 15/16, 4	4640	20 640	4310	19 170	3910	17 390	3500	15 570	2760	12 280				
4 7/8, 4 1/2	5870	26 110	5410	24 060	4830	21 480	4250	18 900	1410	6 270				
4 15/16, 5	7240	32 210	6600	29 360	5810	25 840	5010	22 290						
5 7/16, 5 1/2	8750	38 920	7900	35 140	6840	30 430	4360	19 390						
5 15/16, 6	10410	46 310	9300	41 370	7910	35 190	2390	10 630						
6 7/16, 6 1/2	12200	54 270	10790	48 000	9020	40 120								
6 15/16, 7	14120	62 810	12360	54 980	10150	45 150								
7 7/16, 7 1/2	17270	76 820	14950	66 500	12050	53 600								
7 15/16, 8	18390	81 800	15750	70 060	10710	47 640								
9	20750	92 300	17360	77 220	4140	18 420								
10	22950	102 090	18760	83 450										
12	30700	136 560	23910	106 360										

For speeds lower than 10 RPM
consult Rexnord Bearing Division.

Radial Load Rating for 350 to 1000 RPM (pounds/newtons) *

Shaft Diameter, inches	Shaft Speed, RPM													
	350		400		450		500		600		700		800	
1/2	95	423	90	400	90	400	90	400	85	378	85	378	85	378
5/8	135	600	135	600	130	587	130	587	125	556	120	534	115	512
3/4	160	712	155	689	155	689	150	667	145	645	140	623	130	578
7/8	225	1001	220	979	215	956	210	934	200	890	190	845	180	801
15/16	240	1068	235	1045	225	1001	220	979	210	934	200	890	185	823
1	250	1112	245	1090	240	1068	230	1023	220	979	205	912		
1 1/8	345	1535	335	1490	325	1446	315	1401	295	1312	245	1090		
1 3/16, 1 1/4	360	1601	350	1557	340	1512	325	1446	305	1357	190	845		
1 5/16, 1 3/8	470	2091	455	2024	435	1935	420	1868	345	1535				
1 7/16, 1 1/2	500	2224	480	2135	460	2046	440	1957	205	912				
1 11/16, 1 3/4	655	2914	625	2780	590	2624	340	1512						
1 15/16, 2	815	3625	730	3247	335	1490								
2 3/16, 2 1/4	975	4337	410	1824										
2 7/16, 2 1/2	645	2869												

■ Load ratings are based on industry standards established by the Mechanical Power Transmission Association.

* For plain bore Cast Iron Sleeve Bearing Units use radial load ratings at speeds to the left of the shaded area.

Load Ratings – Bronze Rigid Sleeve Bearing Units

Radial Load Rating for 10 to 300 RPM (pounds/newtons) ■

Shaft Diameter, inches	Shaft Speed, RPM													
	10		50		100		150		200		250		300	
1/2	200	890	200	890	200	890	195	867	195	867	195	867	195	867
5/8	250	1 112	250	1 112	245	1 090	245	1 090	240	1 090	240	1 068	240	1 068
3/4	300	1 334	300	1 334	295	1 312	295	1 312	290	1 290	285	1 268	285	1 268
7/8	435	1 935	430	1 913	425	1 890	420	1 868	415	1 846	410	1 824	405	1 802
15/16	465	2 068	460	2 046	455	2 024	450	2 002	445	1 979	435	1 935	430	1 913
1	495	2 202	490	2 180	485	2 157	480	2 135	470	2 091	465	2 068	460	2 046
1 1/8	700	3 114	690	3 069	680	3 025	670	2 980	660	2 936	650	2 891	640	2 847
1 3/16, 1 1/4	735	3 269	730	3 247	715	3 180	705	3 136	695	3 092	680	3 025	670	2 980
1 5/16, 1 3/8	980	4 359	965	4 293	950	4 226	930	4 137	915	4 070	895	3 981	880	3 914
1 7/16, 1 1/2	1070	4 760	1050	4 670	1030	4 580	1010	4 490	995	4 426	975	4 337	955	4 248
1 11/16, 1 3/4	1470	6 540	1440	6 410	1410	6 270	1370	6 090	1340	5 960	1310	5 830	1280	5 690
1 15/16, 2	1920	8 540	1880	8 360	1830	8 140	1790	7 960	1740	7 740	1690	7 520	1640	7 300
2 3/16, 2 1/4	2440	10 850	2390	10 630	2320	10 320	2240	9 960	2170	9 650	2100	9 340	2030	9 030
2 7/16, 2 1/2	3020	13 430	2940	13 080	2850	12 680	2750	12 230	2650	11 790	2560	11 390	2460	10 940
2 11/16, 2 3/4	3660	16 280	3560	15 840	3430	15 260	3300	14 680	3170	14 100	3040	13 520	2620	11 650
2 15/16, 3	4370	19 440	4230	18 820	4060	18 060	3890	17 300	3720	16 550	3550	15 790	2440	10 850
3 7/16, 3 1/2	5960	26 510	5740	25 530	5470	24 330	5200	23 130	4930	21 930	3610	16 060	1440	6 410
3 15/16, 4	7790	34 650	7460	33 180	7060	31 400	6650	29 580	5910	26 290	For speeds lower than 10 RPM consult Rexnord Bearing Division.			
4 7/8, 4 1/2	9860	43 860	9400	41 810	8820	39 230	8240	36 650	5400	24 020				
4 15/16, 5	12180	54 180	11540	51 330	10740	47 770	9950	44 260	4090	18 190				
5 7/16, 5 1/2	14740	65 570	13880	61 740	12820	57 030	10340	45 990	1820	8 100				
5 15/16, 6	17530	77 980	16420	73 040	15040	66 900	9520	42 350						
6 7/16, 6 1/2	20560	91 460	19150	85 180	17390	77 350	7900	35 140						
6 15/16, 7	23840	106 050	22070	98 170	19870	88 390	5350	23 800						
7 7/16, 7 1/2	29170	129 750	26850	119 430	23950	106 530	1880	8 360						
7 15/16, 8	31090	138 300	28450	126 550	23410	104 130								
9	35150	156 360	31760	141 280	18540	82 470								
10	38950	172 260	34760	154 620	12220	54 360								
12	52300	232 640	45520	202 480										

Radial Load Rating for 350 to 1000 RPM (pounds/newtons)

Shaft Diameter, inches	Shaft Speed, RPM																	
	350		400		450		500		600		700		800		900		1000	
1/2	195	867	190	845	190	845	190	845	185	823	185	823	185	823	180	800	180	800
5/8	235	1045	235	1045	235	1045	230	1023	225	1001	220	979	220	979	215	956	210	934
3/4	280	1246	280	1246	275	1223	270	1201	265	1179	260	1157	255	1134	250	1112	240	1068
7/8	400	1779	395	1757	390	1735	385	1713	375	1668	365	1624	355	1579	325	1446	245	1090
15/16	425	1890	420	1868	415	1846	410	1824	395	1757	385	1713	375	1668	295	1312	200	890
1	450	2002	445	1979	440	1957	430	1913	420	1868	405	1802	360	1601	255	1134	150	667
1 1/8	630	2802	620	2758	605	2691	595	2647	575	2558	525	2335	360	1601	195	867		
1 3/16, 1 1/4	660	2936	645	2869	635	2825	625	2780	600	2669	485	2157	300	1334	115	512		
1 5/16, 1 3/8,	865	3848	845	3759	830	3692	815	3625	735	3269	465	2068	195	867				
1 7/16, 1 1/2	935	4159	915	4070	895	3981	875	3892	635	2825	315	1401						
1 11/16, 1 3/4	1240	5520	1210	5380	1180	5250	930	4137	410	1824								
1 15/16, 2	1590	7070	1500	6670	1110	4940	715	3180										
2 3/16, 2 1/4	1960	8720	1390	6180	830	3692												
2 7/16, 2 1/2	1860	8270	1090	4850														
2 11/16, 2 3/4	1580	7030	545	2424														

■ Load ratings are based on industry standards established by the Mechanical Power Transmission Association.