Precision Linear Motion Components

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LEE®
LINEAR

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For almost fifty years,

LEE Linear has been committed to supplying the world with the finest precision linear motion components.

LEE Linear accomplishes this by providing:

High Quality Products

Through hard work and dedication, we have determined how to manufacture the highest quality products in the business. Our quality control program ensures each component meets or exceeds the industry standards.

Immediate Availability

The many years of experience have taught us to anticipate the sizes and types of products that are the most widely used. We keep an extensive inventory of components on hand so we can rapidly respond to customer requests.

Quick Quotes

Waiting for a quote is never a problem when calling LEE. All sales representatives are eager to answer any questions and will quickly provide a detailed quotation.

Ease of Relationship

Dealing with LEE Linear is easy! From the first inquiry all the way through to order entry and delivery, LEE will be partnered with you each step of the way. We want your interactions with every LEE representative to provide satisfaction, peace of mind, and confidence in choosing us as your linear motion supplier.

Just-In-Time (JIT) Delivery

At LEE, we understand time is money. Whether you order in-stock products or custommachined components, we will make every effort to meet your requirements.

Low Cost

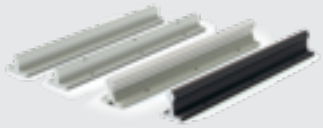
We want to be the supplier of choice for linear motion components. To that end, LEE pricing is the most competitive in the industry. Our customers can be confident in our ability to provide the highest quality products at the lowest possible cost.

LEE Linear is Committed to Work Smarter to Become the Supplier of Choice for Precision Linear Motion Products!

Table of Contents

Product Selection Guide

I Inch Series M ISO Metric Series

shape	sizes	PRODUCT TYPE & DESCRIPTION		Available In:			found on page	
				Open	closed	Wide	I	M
round shaft	I M	**Round Shafting**	Materials: ceramic coated aluminum, hardened steel, 440 stainless steel				3, 5–6	40–42
			Cut to length, random lengths, machined, pre-drilled, or tapped.					
round shaft	I M	**Support Rails & Assemblies**	Materials: ceramic coated aluminum, hardened steel, 440 stainless steel				9–10	43–44
			Cut to length, random lengths, machined, pre-drilled, or tapped.					
round shaft	I M	**Roller Pillow Blocks**	Materials: ceramic coated aluminum, hardened steel, 440 stainless steel				13–17	45–46
			Cam flollower design available in single and twin configurations.					
round bearings	I M	**Plain**	Materials: aluminum alloy, stainless steel	•	•		27–32	57–58
			Self lubricating bearing with patented compound of PTFE developed for improved performance over other bearings. Standard sizes in stock.					
	I M	**Ball**	Materials: steel and polymer	•	•	•	18–20, 23, 26	47, 49
			Each ball bearing consists of an outer cylinder, ball retainer, balls, and double seals.					
	M	**Thin Wall**	Materials: aluminum alloy housing anodized or steel with polymer retainer		•			56, 61–62
			Both plain and ball bearing versions of European metric sizes.					
	I M	**Sleeve & Sleeve with flange**	Materials: aluminum alloy housing		•		36–37	66–67
			Replaces Oilite, bronze, and plastic bearings. Ideal for slow or moderate speeds for oscillating or rotary motion.					
round bearings with housings	I M	**Open & Closed Pillow Blocks**	Materials: aluminum alloy housing with clear anodized coating	•	•	•	21–22, 24–25, 33–34	48, 59–60
			Available with either plain or ball bearings. Self aligning for ease of mounting. Standard sizes in stock.					
	I	**Flange Mount**	Materials: aluminum alloy housing with clear anodized coating and inner plain bearing	•		•	35	
			Ease of mounting. Compact design.					
	M	**Flange Bearing**	Materials: aluminum alloy housing with clear anodized coating or steel with polymer retainer		•	•		50–55, 63–65
			Both plain and ball bearing available. Ease of mounting. Compact design.					

I INCH Series — Inch Contents

Common Buttons and Links

Order Online

Configure and Download CAD

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E-mail an Application Engineer

In our digital version of this catalog, you can click these icons to get more information.
Note: Hyperlinks go to English language website.

Inch Round Shafting Steel & Stainless Steel

60 Plus® Shafting

LEE Linear® formulated a linear shaft designed specifically for optimal bearing performance – 60 Plus Shafting. Advanced process capabilities maintain the ideal surface finish for linear bearings resulting in the longest life and highest performing shaft-to-bearing combination available:

- Optimized surface finish
- Faster break-in and better Frelon® transfer for plain bearings
- Longest life possible, less down time and maintenance
- Straight to within .001" to .002" per foot cumulative, except on 3/8" diameter and smaller

See Pages 11–12 for machining options.

60 PLUS SHAFTING

Inch Shaft Part • Numbering Chart

Class	Diameter	Material		Length		Type
NIL	03	SS	–	010.000	–	CM

Class	
Code	**Description**
NIL	Inch Class L Shaft
NIPDL	Inch Class L Predrill
CC	Feather Inch
CCPDL	Feather Inch Predrill
SR	Inch Support Rail
SRA	Inch Support Rail Assembly
CCR	Feather Rail Assembly
LSRA	Inch Low Support Rail Assembly
LSR	Inch Low Support Rail
LSG	Inch Low Support Rail Assembly
NIS	Inch Class S Shaft
NIN	Inch Class N Shaft

Diameter	
Code	**Description**
03	3/16"
04	1/4"
06	3/8"
08	1/2"
10	5/8"
12	3/4"
16	1"
20	1 1/4"
24	1 1/2"
32	2"
40	2 1/2"
48	3"
64	4"

Special

CM - Custom Machine
SL - Specified Length

Shaft Length

Inch - 0000.000

Material

Blank - 1060 CS
SS - 440 SS
SS303 - 303 SS*
CP - Chrome plate**
AR - Armoloy**

* 300 Series available in most diameters

**Available as special quotes

Sample Part Numbers
Feather inch, 1" diameter and 15" long **CC16-015.000**
Support rail assembly 1.5" diameter 440 stainless steel and 12" long **SRA24SS-012.000**

Product Configurators

Your Design, Your Way, Fast!

Check Out LEE®'s NEW Configurators

Shafting • Roller Pillow Block • Support Rail Assembly

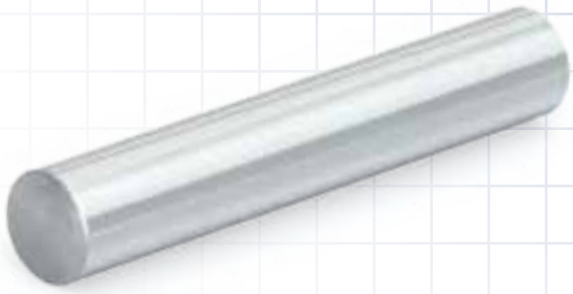
- 5 Simple steps to customize and configure shafting
- Custom CAD file delivered in minutes
- Custom quote generated quickly and easily
- Visit leelinear.com/configure and start designing!

LEE Linear´s configuration tools allow you to customize and configure linear shafts and components to exact specifications.

Configurator

Shafting Steel, Stainless Steel & Ceramic Coated

RC60 Steel Solid Shafting NI



- RC 60 Plus case hardened steel shafting
- Optimized for Simplicity bearings and linear ball bearings
- Available cut-to-length or full lengths
- Length tolerance:
  3/16" – 1-1/4" shaft = +/- .030"
  1-3/8" – 2" shaft = +/- .060"
  2-1/2" – 4" shaft = +/- .125"

Part No.	Nominal Dia.	Dia. Tolerance Class L* in.		Dia. Tolerance Class S* in.		Dia. Tolerance Class N* in.		MAX** Length	MIN Hardness Depth	Weight per in.
	in.	MIN	MAX	MIN	MAX	MIN	MAX	in.	in.	lbs.
NI_* 03-xxx.xxx	3/16"	0.1865	0.1870	–	–	–	–	252	N/A	0.008
NI_* 04-xxx.xxx	1/4"	0.2490	0.2495	0.2485***	0.2490***	0.2498***	0.2500***	252	0.040	0.014
NI_* 06-xxx.xxx	3/8"	0.3740	0.3745	0.3735***	0.3740***	0.3748***	0.3750***	252	0.060	0.031
NI_* 08-xxx.xxx	1/2"	0.4990	0.4995	0.4985	0.4990	0.4998	0.5000	180	0.060	0.055
NI_* 10-xxx.xxx	5/8"	0.6240	0.6245	0.6235	0.6240	0.6248	0.6250	180	0.060	0.086
NI_* 12-xxx.xxx	3/4"	0.7490	0.7495	0.7485	0.7490	0.7498	0.7500	180	0.060	0.125
NI_* 14-xxx.xxx	7/8"	0.8740	0.8745	--	--	0.8748	0.8750	180	0.060	0.170
NI_* 16-xxx.xxx	1"	0.9990	0.9995	0.9985	0.9990	0.9998	1.0000	192	0.080	0.222
NI_* 18-xxx.xxx	1-1/8"	1.1240	1.1245	--	--	1.1248	1.1250	180	0.080	0.281
NI_* 20-xxx.xxx	1-1/4"	1.2490	1.2495	1.2485	1.2490	1.2498	1.2500	180	0.080	0.348
NI_* 22-xxx.xxx	1-3/8"	1.3740	1.3745	--	--	1.3747	1.3750	180	0.080	0.420
NI_* 24-xxx.xxx	1-1/2"	1.4989	1.4994	1.4984	1.4989	1.4997	1.5000	180	0.080	0.500
NI_* 28-xxx.xxx	1-3/4"	1.7490	1.7495	--	--	1.7497	1.7500	180	0.100	0.681
NI_* 32-xxx.xxx	2"	1.9987	1.9994	1.9980	1.9987	1.9997	2.0000	180	0.100	0.890
NI_* 40-xxx.xxx	2-1/2"	2.4985	2.4993	2.4977	2.4985	2.4996	2.5000	180	0.100	1.391
NI_* 48-xxx.xxx	3"	2.9983	2.9992	2.9974	2.9983	2.9996	3.0000	140	0.100	2.003
NI_* 64-xxx.xxx	4"	3.9976	3.9988	–	–	–	–	140	0.100	3.560

*Third letter of Part No. reflects the shaft class (NIL for Class L, NIS for Class S, and NIN for Class N).

**MAX length subject to change.

***1/4" and 3/8" shafting are available in class S and N for volume requests only.

Notes: (1) Specify length in part number using inches.
(2) Example: for 1/2"class T shafting total length 15" = NIL08-015.000
(3) Surface finish bearing recommended 8–10Ra.

440 Stainless Steel

Solid Shafting NIL_SS

Part No.	Nominal Dia.	Dia. Tolerance Class L* in.		Dia. Tolerance Class S* in.		MAX** Length	MIN Hardness Depth	Weight per in.
	in.	MIN	MAX	MIN	MAX	in.	In.	lbs.
NIL03SS-xxx.xxx	3/16"	0.1865	0.1870	N/A	N/A	252	N/A	0.008
NIL04SS-xxx.xxx	1/4"	0.2490	0.2495	0.2485	0.2490	252	0.040	0.014
NIL06SS-xxx.xxx	3/8"	0.3740	0.3745	0.3735	0.3740	252	0.040	0.031
NIL08SS-xxx.xxx	1/2"	0.4990	0.4995	0.4985	0.4990	154	0.060	0.055
NIL10SS-xxx.xxx	5/8"	0.6240	0.6245	0.6235	0.6240	154	0.060	0.087
NIL12SS-xxx.xxx	3/4"	0.7490	0.7495	0.7485	0.7490	154	0.060	0.125
NIL16SS-xxx.xxx	1"	0.9990	0.9995	0.9985	0.9990	176	0.080	0.222
NIL20SS-xxx.xxx	1-1/4"	1.2490	1.2495	1.2485	1.2490	154	0.080	0.348
NIL24SS-xxx.xxx	1-1/2"	1.4989	1.4994	1.4984	1.4989	154	0.080	0.498
NIL32SS-xxx.xxx	2"	1.9987	1.9994	1.9980	1.9987	154	0.100	0.886

*Third letter of Part No. reflects the shaft class (NIL for Class L, NIS for Class S, and NIN for Class N).

**MAX length subject to change.

- 440 stainless steel RC 50 Plus™ hardness
- Optimized for Simplicity bearings and linear ball bearings
- Available cut-to-length or full lengths
- Length tolerance:
  3/16" – 1-1/4" shaft = +/- .030"
  1-3/8" – 2" shaft = +/- .060"
  2-1/2" – 4" shaft = +/- .125"

Email an Application Engineer

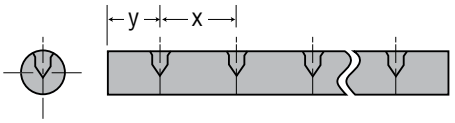
Shafting Steel, Stainless Steel & Ceramic Coated

Pre-Drilled & Tapped

Steel NIPDL • 440 Stainless Steel NIPDL_SS

Part No.		Nominal Dia.	Dia. Tolerance Class L in.		Standard Hole Spacing		Thread	MAX Length		Weight per in.
								Steel	Stainless	
Steel	Stainless Steel	in.	MIN	MAX	x	y		in.	in.	lbs.
NIPDL08-xxx.xxx	NIPDL08SS-xxx.xxx	1/2"	0.4990	0.4995	4	2	6-32	180	154	0.055
NIPDL10-xxx.xxx	NIPDL10SS-xxx.xxx	5/8"	0.6240	0.6245	4	2	8-32	180	154	0.086
NIPDL12-xxx.xxx	NIPDL12SS-xxx.xxx	3/4"	0.7490	0.7495	6	3	10-32	180	154	0.125
NIPDL16-xxx.xxx	NIPDL16SS-xxx.xxx	1"	0.9990	0.9995	6	3	1/4-20	180	176	0.222
NIPDL20-xxx.xxx	NIPDL20SS-xxx.xxx	1-1/4"	1.2490	1.2495	6	3	5/16-18	180	154	0.348
NIPDL24-xxx.xxx	NIPDL24SS-xxx.xxx	1-1/2"	1.4989	1.4994	8	4	3/8-16	180	154	0.500
NIPDL32-xxx.xxx	NIPDL32SS-xxx.xxx	2"	1.9987	1.9994	8	4	1/2-13	180	154	0.890
NIPDL48-xxx.xxx	*	3"	2.9983	2.9992	8	4	3/4-10	140	–	2.003

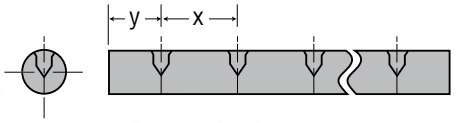
*Special orders avaiable on this option.

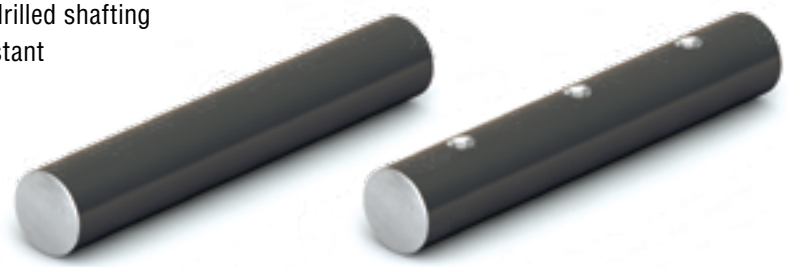


Notes: (1) Specify length in part number using inches.
(2) Example: for 1/2" shafting total length 15" = NIPDL08-015.000
(3) Customer specifies 'y' dimension, if different than standard. Hole-to-hole tolerance = +/-.015".
(4) Consult factory for chrome plated, 303, or 316 stainless steel shafting.

Ceramic Coated

- Aluminum alloy base material
- RC 70 ceramic coated finish
- Designed to run with Simplicity Frelon GOLD® lined bearings
- Interchanges with standard pre-drilled shafting
- Non-magnetic and vibration resistant
- Weld splatter, paints, and contaminants will not stick
- Do NOT use with linear ball bearings





Solid Shafting CC

Part No.	Nominal Dia.	Diameter Tolerance		MAX Length	Weight
	in.	MIN	MAX	in.	lbs./in.
CC03-xxx.xxx	3/16"	0.1863	0.1871	138	0.003
CC04-xxx.xxx	1/4"	0.2488	0.2496	138	0.005
CC06-xxx.xxx	3/8"	0.3738	0.3746	138	0.010
CC08-xxx.xxx	1/2"	0.4988	0.4996	138	0.019
CC10-xxx.xxx	5/8"	0.6238	0.6246	138	0.030
CC12-xxx.xxx	3/4"	0.7488	0.7496	138	0.043
CC16-xxx.xxx	1"	0.9988	0.9996	138	0.077
CC20-xxx.xxx	1-1/4"	1.2488	1.2496	138	0.120
CC24-xxx.xxx	1-1/2"	1.4987	1.4995	138	0.173
CC32-xxx.xxx	2"	1.9985	1.9995	138	0.308

Notes: (1) Specify length in part number using inches.
Example: for 1/2" shafting total length 36" long = CC08-036.000.
(2) Ends of cut-to-length shafting are not coated.
(3) Fully coated shafting is available on special request.

Pre-Drilled & Tapped CCPDL

Part No.	Nominal Dia.	Diameter Tolerance		Standard Hole Spacing		Thread	MAX Length	Weight
	in.	MIN	MAX	x	y		in.	lbs./in.
CCPDL08-xxx.xxx	1/2"	0.4988	0.4996	4	2	6-32	138	0.019
CCPDL10-xxx.xxx	5/8"	0.6238	0.6246	4	2	8-32	138	0.030
CCPDL12-xxx.xxx	3/4"	0.7488	0.7496	6	3	10-32	138	0.043
CCPDL16-xxx.xxx	1"	0.9988	0.9996	6	3	1/4-20	138	0.077
CCPDL20-xxx.xxx	1-1/4"	1.2488	1.2496	6	3	5/16-18	138	0.120
CCPDL24-xxx.xxx	1-1/2"	1.4987	1.4995	8	4	3/8-16	138	0.173
CCPDL32-xxx.xxx	2"	1.9985	1.9995	8	4	1/2-13	138	0.308

Notes: (1) Specify length in part number using inches.
Example: for 1/2" shafting total length 36" long = CCPDL08-036.000.
(2) Ends of cut-to-length shafting are not coated.
(3) Fully coated shafting is available on special request.
(4) Counterbore .063" from top.
(5) Customer specifies 'y' dimension, if different than standard.

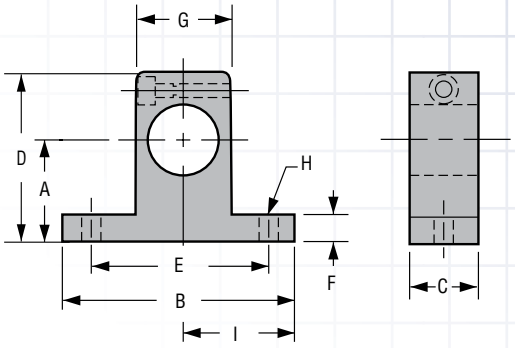
Configure

Shafting End Support Blocks

Aluminum End Support Block NSB

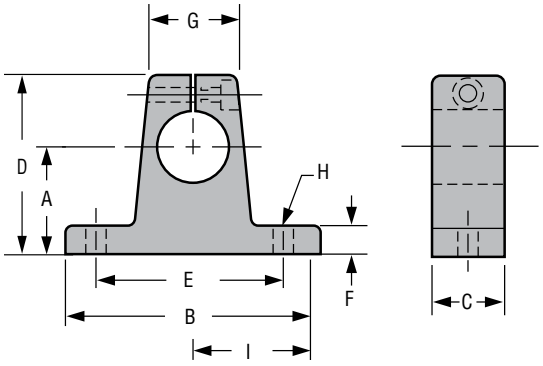
End support blocks can be used for end or intermittent shaft support. The aluminum end support block is lightweight and strong, and can be used with all shaft types. Ideally, they should be used where deflection between supports is not a problem.

- Available in inch sizes from 1/4"- 2"
- Instant bolt-down installation



Part No.	Nominal Dia.	A	B	C	D	E	F	G	H		I	Weight
	in.	+/-.001				+/-.001			Bolt	Hole	+/-.001	lb.
NSB04	1/4"	0.687	1.500	0.500	1.050	1.125	0.250	0.625	#6	5/32"	0.750	0.038
NSB06	3/8"	0.750	1.625	0.563	1.175	1.250	0.250	0.688	#6	5/32"	0.800	0.044
NSB08	1/2"	1.000	2.000	0.625	1.625	1.500	0.250	0.750	#8	3/16"	1.000	0.079
NSB10	5/8"	1.000	2.500	0.688	1.750	1.875	0.313	0.875	#10	7/32"	1.250	0.112
NSB12	3/4"	1.250	2.500	0.750	2.055	2.000	0.313	1.000	#10	7/32"	1.375	0.148
NSB16	1"	1.500	3.055	1.000	2.500	2.500	0.375	1.375	1/4"	9/32"	1.625	0.313
NSB20	1-1/4"	1.750	3.750	1.125	3.000	3.000	0.438	1.750	5/16"	11/32"	2.000	0.527
NSB24	1-1/2"	2.000	4.375	1.250	3.435	3.500	0.500	2.000	5/16"	11/32"	2.375	0.755
NSB32	2"	2.500	5.500	1.500	4.375	4.500	0.625	2.625	3/8"	13/32"	3.000	1.464

Steel End Support Block LSB



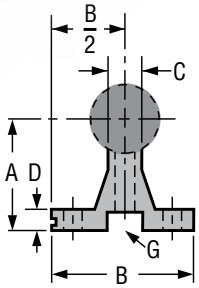
Part No.	Retired Part No.	Nom. Shaft Diameter	A ±.002	B	C	D	E ±.005	F	G	H		Weight (lbs.)
										Bolt	Hole	
LSB08	SB-8	1/2	1.000	2.000	0.625	1.625	1.500	0.250	0.750	#10	7/32	0.270
LSB10	SB-10	5/8	1.000	2.500	0.750	1.750	1.875	0.312	0.875	#10	7/32	0.400
LSB12	SB-12	3/4	1.250	2.750	0.750	2.125	2.000	0.375	1.000	1/4	9/32	0.520
LSB16	SB-16	1	1.500	3.312	1.000	2.625	2.500	0.375	1.375	1/4	9/32	1.110
LSB20	SB-20	1-1/4	1.750	4.000	1.250	3.000	3.000	0.437	1.750	5/16	11/32	1.910
LSB24	SB-24	1-1/2	2.000	4.750	1.250	3.500	3.500	0.500	2.000	5/16	11/32	2.520
LSB32	SB-32	2	2.500	6.000	1.500	4.500	4.500	0625	2.625	3/8	13/32	5.100

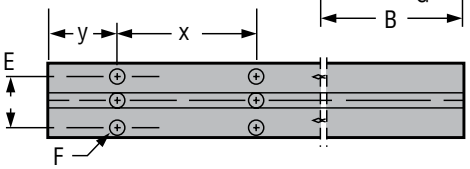
Shafting Rail Assemblies

Rail Assembly – Aluminum Support Rail SRA

- Two piece assembly RC60 steel shaft and aluminum support rail standard
- Other shaft materials – 440 stainless steel and ceramic coated aluminum
- Available cut-to-length, tolerance:

60 PLUS SHAFTING





3/16"–1¼" shaft = +/- 0.030"
1⅜"–2" shaft = +/- 0.060"
2½"–4" shaft = +/- 0.125"

Configure

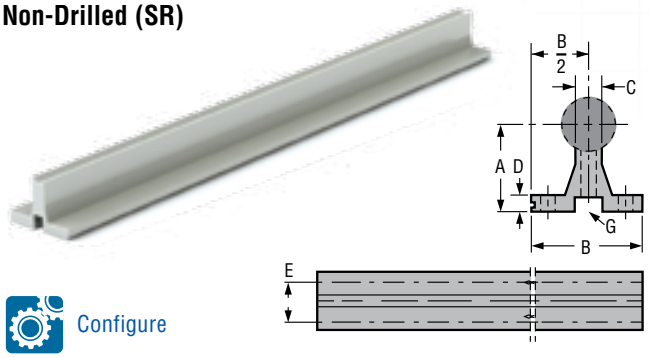
Shafting Type			Nominal Dia.	Diameter Tolerance		A	B	C	D	E	F		Standard Hole Spacing		Weight
Steel rail Part No.	Ceramic coated shafting Part No.	440 stainless steel Part No.	in.	MIN	MAX	+/-.002					Bolt	Hole	x	y	lbs./in.
SRA08-xxx.xxx	SRA08CC-xxx.xxx	SRA08SS-xxx.xxx	1/2	0.4988	0.4996	1.125	1.500	0.250	0.188	1.000	#6	0.169	4	2	0.101
SRA10-xxx.xxx	SRA10CC-xxx.xxx	SRA10SS-xxx.xxx	5/8	0.6238	0.6246	1.125	1.625	0.313	0.250	1.125	#8	0.193	4	2	0.145
SRA12-xxx.xxx	SRA12CC-xxx.xxx	SRA12SS-xxx.xxx	3/4	0.7488	0.7496	1.500	1.750	0.375	0.250	1.250	#10	0.221	6	3	0.202
SRA16-xxx.xxx	SRA16CC-xxx.xxx	SRA16SS-xxx.xxx	1	0.9988	0.9996	1.750	2.125	0.500	0.250	1.500	1/4"	0.281	6	3	0.328
SRA20-xxx.xxx	SRA20CC-xxx.xxx	SRA20SS-xxx.xxx	1-1/4	1.2488	1.2496	2.125	2.500	0.563	0.313	1.875	5/16"	0.343	6	3	0.493
SRA24-xxx.xxx	SRA24CC-xxx.xxx	SRA24SS-xxx.xxx	1-1/2	1.4987	1.4995	2.500	3.000	0.688	0.375	2.250	5/16"	0.343	8	4	0.711
SRA32-xxx.xxx	SRA32CC-xxx.xxx	SRA32SS-xxx.xxx	2	1.9985	1.9995	3.250	3.750	0.875	0.500	2.750	3/8"	0.406	8	4	1.231

Note: Specify length in part number using inches. Example: for 1/2" shafting total length 36" long = SRA08-036.000.
Customer specifies 'y' dimension, if different than standard.

Shafting Rail Assemblies

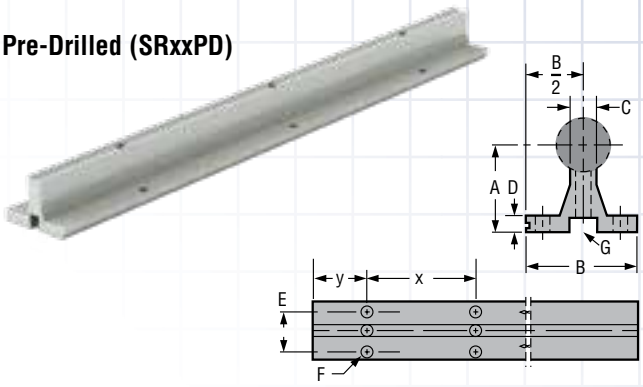
Support Rail – Aluminum SR & SR_PD

Non-Drilled (SR)



Configure

Pre-Drilled (SRxxPD)

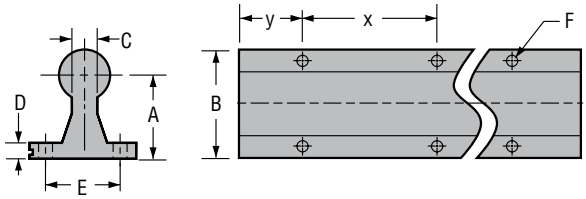


Part No.		Nominal Dia.	A					Standard Hole Spacing		F	G Mounting Bolt Size		MAX Length	Weight
Non-drilled	Pre-drilled	in.	+/-.002	B	C	D	E	x	y	Hole	Screw	Fastener Length	+0/-.125	lbs./in.
SR08-xxx.xxx	SR08PD-xxx.xxx	1/2"	1.125	1.500	0.250	0.188	1.000	4	2	0.169	6-32 x 7/8"	7/8"	48	0.045
SR10-xxx.xxx	SR10PD-xxx.xxx	5/8"	1.125	1.625	0.313	0.250	1.125	4	2	0.193	8-32 x 7/8"	7/8"	48	0.058
SR12-xxx.xxx	SR12PD-xxx.xxx	3/4"	1.500	1.750	0.375	0.250	1.250	6	3	0.221	10-32 x 7/8"	7/8"	48	0.077
SR16-xxx.xxx	SR16PD-xxx.xxx	1"	1.750	2.125	0.500	0.250	1.500	6	3	0.281	1/4-20 x 1-1/2"	1-1/2"	48	0.104
SR20-xxx.xxx	SR20PD-xxx.xxx	1-1/4"	2.125	2.500	0.563	0.313	1.875	6	3	0.343	5/16-18 x 1-3/4"	1-3/4"	48	0.145
SR24-xxx.xxx	SR24PD-xxx.xxx	1-1/2"	2.500	3.000	0.688	0.375	2.250	8	4	0.406	3/8-16 x 2"	2"	48	0.210
SR32-xxx.xxx	SR32PD-xxx.xxx	2"	3.250	3.750	0.875	0.500	2.750	8	4	0.531	1/2-13 x 2-1/2"	2-1/2"	48	0.342

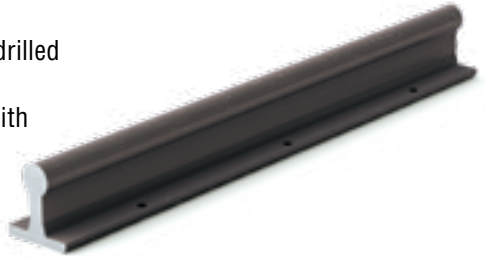
Notes: (1) Specify length in part number. Example: for 1/2" shafting support rail to 24" length = SR08-024.000 (Aluminum alloy construction).
(2) Shafts and support rails sold separately. Customer specifies 'y' dimension. Shaft rails and assemblies are available in long lengths, consult factory.

Rail Assembly – Ceramic Coated CCR

- Aluminum alloy base material and RC70 ceramic coated finish
- One-piece integrated design eliminates assembly time
- Weld splatter, paints, and contaminants will not stick
- Non-magnetic and vibration resistant



- Economical, lightweight alternative to traditional steel shafting
- Optimized for Simplicity Frelon GOLD® lined bearings
- Available pre-drilled and undrilled*
- Do NOT use with linear ball bearings



Part No.	Nominal Dia.	Diameter Tolerance		A	B	C	D	E	F		Standard Hole Spacing		MAX Length	Weight
	in.	MIN	MAX	.002					Bolt	Hole	x	y	in.	lbs./in.
CCR08-xxx.xxx	1/2	0.4988	0.4996	1.125	1.500	0.250	0.188	1.000	#6	0.169	4	2	120	0.019
CCR10-xxx.xxx	5/8	0.6238	0.6246	1.125	1.625	0.313	0.250	1.125	#8	0.193	4	2	120	0.030
CCR12-xxx.xxx	3/4	0.7488	0.7496	1.500	1.750	0.375	0.250	1.250	#10	0.221	6	3	120	0.043
CCR16-xxx.xxx	1	0.9988	0.9996	1.750	2.125	0.500	0.250	1.500	1/4"	0.281	6	3	120	0.076
CCR20-xxx.xxx	1-1/4	1.2488	1.2496	2.125	2.500	0.563	0.313	1.875	5/16"	0.343	6	3	120	0.119
CCR24-xxx.xxx	1-1/2	1.4987	1.4995	2.500	3.000	0.688	0.375	2.250	5/16"	0.343	8	4	120	0.172
CCR32-xxx.xxx	2	1.9985	1.9995	3.250	3.750	0.875	0.500	2.750	3/8"	0.406	8	4	120	0.305

Notes: (1) Specify length in part number using inches.
Example: for 1/2" shafting total length 36" long = CCR08-036.000.
(2) Cut-to-length rails may not be coated on the ends.
Customer specifies 'y' dimension, if different than standard.
*Undrilled rails are available on special request

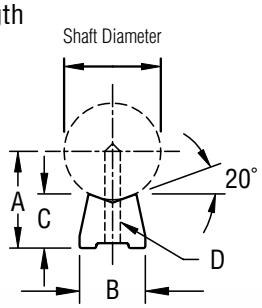
Shafting Low Support Rails

60 PLUS SHAFTING

Low Support Rail – Steel LSR

The AISI C-1018 steel LSR shaft support is a low support rail with a reduced footprint, and 40% lower profile than other support rails. This is an excellent choice for applications requiring compact low shaft support.
The standard length for LSR type supports is 48".

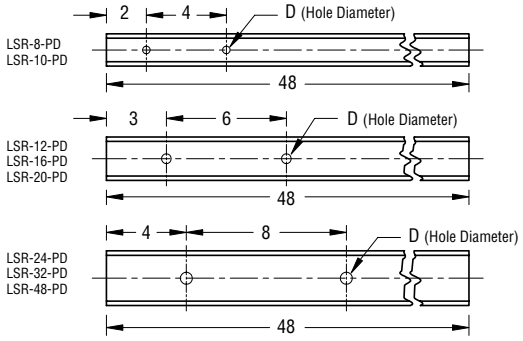
Length tolerance +0", -1/8".



Part No.	Assembly Part No.	Shaft Dia.	A	B	C	D		Hole spacing for LSR-PD pre-drilled		Weight per 48" (approximate)	Assemply Weight per 48" (approximate)
		in.	+/-.002	+/-.005	(REF)	Bolt	Hole	y	x	lbs. +/-.001	lbs. +/-.001
LSR-8	LSRA-8	1/2	0.562	0.370	0.341	6-32	0.169	2	4	1.320	3.960
LSR-8-PD											
LSR-10	LSRA-10	5/8	0.687	0.450	0.412	8-32	0.193	2	4	1.950	6.078
LSR-10-PD											
LSR-12	LSRA-12	3/4	0.750	0.510	0.420	10-32	0.221	3	6	2.250	8.250
LSR-12-PD											
LSR-16	LSRA-16	1	1.000	0.690	0.560	1/4-20	0.281	3	6	4.250	14.910
LSR-16-PD											
LSR-20	LSRA-20	1-1/4	1.187	0.780	0.626	5/16-18	0.343	3	6	5.080	21.780
LSR-20-PD											
LSR-24	LSRA-24	1-1/2	1.375	0.930	0.703	3/8-16	0.406	4	8	6.720	30.720
LSR-24-PD											
LSR-32	LSRA-32	2	1.750	1.180	0.845	1/2-13	0.531	4	8	11.000	53.720
LSR-32-PD											
LSR-48	LSRA-48	3	2.750	1.875	1.404	3/4-10	0.812	4	8	27.920	124.060
LSR-48-PD											

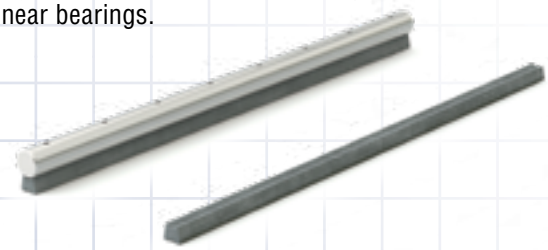
How to order

- When ordering standard 48" long low shaft rails without mounting holes, order by part number. For example, LSR-12.
- If standard mounting holes are required, specify low shaft rails with pre-drilled mounting holes by part number. For example, LSR-12-PD. Hole sizes and spacings are shown in the table.
- If other than standard hole spacing is required, please provide drawings with all dimensions, tolerances, and quantity. With or without mounting holes, low shaft rails will be supplied in 48" lengths when ordered by part number.



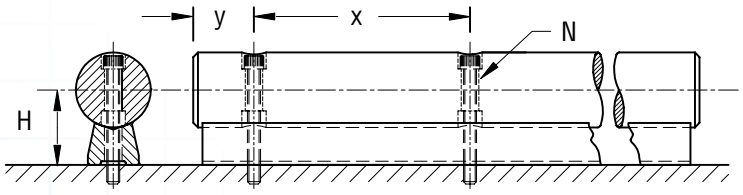
Low Support Rail & Shaft Set LSG

Precision case hardened and ground shaft, plus an LSR steel support rail, effectively doubles the life of the shaft by allowing it to be turned over for a fresh surface when wear becomes evident. Both sides of the shaft are counterbored so the shaft may be rotated 180°, and rebolted for use on the new side. This guide is sold as a two-piece set; the shaft and support are not assembled. The guide is then bolted down through the top of the shaft to reduce installation time. The shafts are also available in 440C stainless steel. Drilled through and counterbored shafts may not be suitable for all linear bearings.



Part No.	Shaft Dia.	H	B	Y	X	N	Weight per in.
	in.	in.	in.	in.	in.	in.	lbs.
LSG-10	5/8	0.687	0.450	2	4	#5	0.132
LSG-12	3/4	0.750	0.510	3	6	#6	0.171
LSG-16	1	1.000	0.690	3	6	#10	0.311
LSG-20	1-1/4	1.187	0.780	3	6	5/16	0.454
LSG-24	1-1/2	1.375	0.930	4	8	3/8	0.640
LSG-32	2	1.750	1.180	4	8	1/2	1.119

Note: Customer specifies 'y' dimension.



Custom Machining Options for Shafts

Special Machining

Standard 60 Plus shafting, which is avaiable from stock, can be cut with special length tolerances. 60 Plus shafting may also be drilled with a variety of radial holes and tapped if needed. Shafts can be supplied with flats, keyways, and reduced diameters. Shafts can also be plated.

There is an extra charge for all special machining operations. For specific prices, send your drawing or technical description to LEE.

Special Length Tolerances

LEE standard length tolerances are:

< 1 1/4" diameter	± 1/32" (± .03")
1 3/8"–2" diameter	± 1/16" (± .06")
> 2" diameter	± 1/8" (± .125")

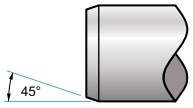
Contact us with special requirements. LEE can accommodate up to ± .001".

Special Straightness Tolerances

LEE standard length tolerances are .001 to .002"/foot cumulative. Except for 3/8" diameters and less.

Contact us with special requirements.

Standard Chamfers



Diameter	Size	Tolerance
≤ 3/8"	Break Edge	± 10.005–0.010" x 45°
12 mm–7/8"	1/32" x 45°	± 0.005"
1"–_2"	1/16" x 45°	± 0.010"
2 1/2"–3"	1/8" x 45°	± 0.010"

Special chamfer at any angle can be supplied for an additional charge.

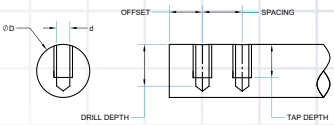
Machining Shaft Ends

For all machining requirements with turned ends, LEE will anneal the end. The annealing process may cause approximately 1/4" to 1/2" of heat travel from machined area (depending on major shaft O.D.).Hardness of major shaft diameter near the machined area will be below the Rockwell for the material. If annealing effects are objectionable, alternate machining processes can be used which prevent major diameter softening.

Contact factory for special options.

Radial Holes Drilled and Tapped to Center of Shaft

U.N.C. or U.N.F.
Class 2-B thread.

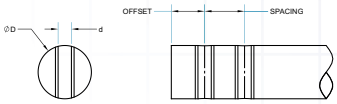


Hole to Hole	± 0.010" Non-Accum
Hole to Centerline	± 0.0075"
Hole to End	± 0.030" (± .06 mm)

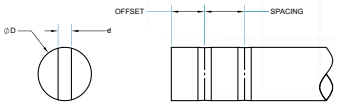
Note: Hole depth full threads to 1/2" of the shaft diameter.

Radial Holes Drilled and Tapped through Shaft

Annealed and soft around circumference in hole area.



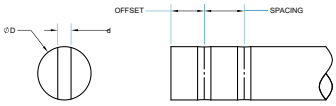
Radial Holes Drilled through Shaft



Hole Diameter	± 0.005"
Hole to Hole	± 0.010" Non-Accum
Hole to Centerline	± 0.0075"
Hole to End	± 0.030"

Radial Holes Drilled and Reamed through Shafts

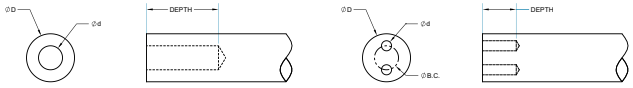
Annealed and soft around circumference in hole area.



Hole Diameter	± 0.001"
Hole to Hole	± 0.010" Non-Accum
Hole to Centerline	± 0.0075"
Hole to End	± 0.030"

Threaded Shaft Diameter

Standard threads are either Unified National Coarse or Unified National Fine, Class 2-A fit. Shafts will be annealed and soft around the circumference of threaded areas within the case

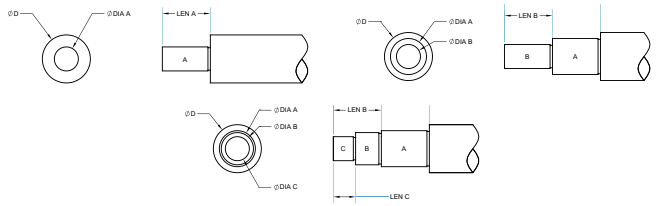


Standard Threads	UNC or UNF Class 2-A

Note: Threading area will be annealed and soft.

Reduced Shaft Diameter

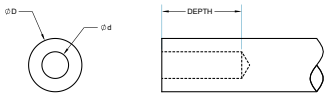
Standard diameter tolerances on turned down diameters are ± .001". Special tolerances of ± .0001"are availabe. Runout is within .001" total indicator reading. Shafts are annealed and soft in turned down sections within case. Two-step shaft diameter reduction is also avaiable.



Normal Tolerance	± .001"
Concentricity	± .002" MAX T.I.R.

Note: Shafts turned down require annealing.

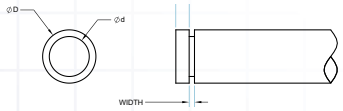
Coaxial Holes Drilled and Tapped in Center of End of Shaft



Concentricity	0.01"
Diameter of Holes	± 0.006"
Bored Holes	± 0.001"
Bolt Circles	± 2°
Coaxial on Both Ends	OAL ± 0.015"
Axial on One End	OAL ± 0.030"

Note: Depth is twice the diameter of the tap minimum.

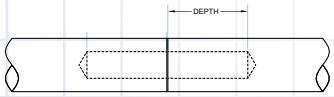
Retaining Ring Groove



Location Tolerance	± 0.062" Standard
	± 0.005" Custom

Note: Retaining ring location will be annealed.

Dowel Joints



Match over joint of 0.002 Maximum TIR	
All Linear Dimensions	± 0.010"
First Hole	± 0.0075"
Shaft Diameter	5/8" to 3"

Note: Ends machined square without chamfer.

Butted Joints

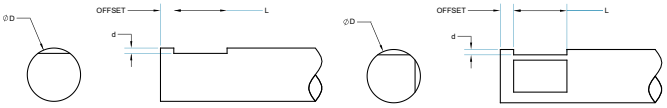
Ends machined square, no chamfer. Available for all Nominal shaft diameters.

Perpendicularity	± 0.001" MAX
All Linear Dimensions	± 0.010"

Note: Ends machined square without chamfer.

Flat(s) on Shaft

Flats are availabel. Flats extending over large portion of shaft or entire lenght of shaft are not available. Cutting into hardened layer would cause considerable warping and subsequent straightening costs would be prohibitive.

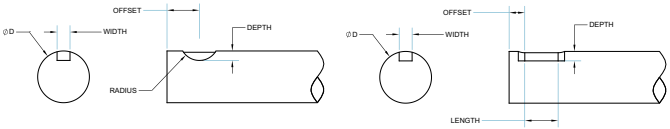


Location Tolerance	± 0.010"

Keyways

Keyways may be square, flat or American Standard Woodruff. Available for Nominal shaft diameters from 1/2" through 4".

Other options available. Contact us for a quote.

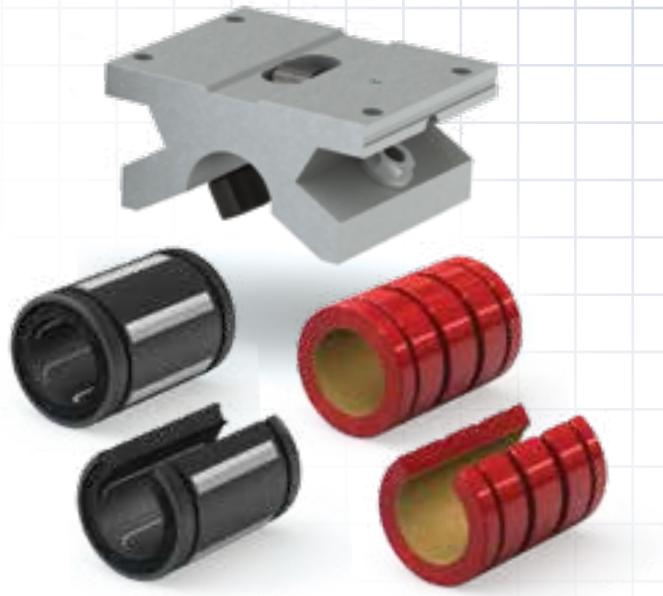


Width	± 0.001"
Length	± 0.010"
Linear Locations	± 0.010"
Location to C/L	± 0.0075"
Depth	1/2" width + “M” on table 8

Note: Square or American Standard Woodruff.
Maximum length in house is 48".

Bearings Technology

Good engineering principles dictate that the best bearing design be utilized for any given bearing application.



Each family of bearing has advantages and disadvantages.

These strengths or limitations can make it a clear choice depending on the application. In other applications the engineer may be able to choose from multiple technologies.

LEE® Linear is proud to offer a wide variety of bearing products.

The chart below is a quick guide to review the technology differences.

Bearing Type	Load	Moment Loads	Linear Speed	Coefficient of Friction	Precision	Environment	Inch Pages	Metric Pages
Roller Overview 15–16 	Up to 10x ball bearing	Limited	Up to 2.5x faster than ball bearing	Good	Fair	Adaptable	14–17	44–45
Ball Overview 19–20 	Limited due to point-to-point contact of balls to shaft	Moderate to Good High moment loads can cause increased wear and shorten bearing life	Up to 590 sfm (3 m/sec) Always requires lubrication	Good, but reliant on evironment	Fair	Limited	18–26	46–55
Plain Overview 28–31 	Up to 20x ball bearings	Limited due to 2:1 ratio	Up to 300 sfm (1.524 m/sec) Up to 825 sfm (4.19 m/sec) with lubrication	Fair, but consistent over life	Good	Adaptable	27–37	56–66

Which is right for your application?

LEE has available Engineering support to help you select the right technology. Call us at 1-800-221-0811 or email at leelinear@linearmotion.com.

Consult Factory • 800-221-0811

Email an Application Engineer

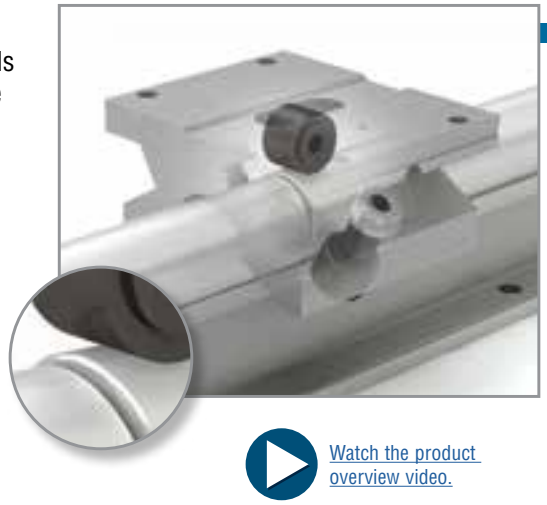
Roller Pillow Blocks Overview

Reliability

- Large cam follower design with side seals delivers superior contaminant resistance
- Excels in long travel, joined shafts, or rail assembiles
- Accessories such as lubrication ports and scrapers are available for ease of maintenance and maximum life

Design Compatibility

- Interchangeability to industry standard mounting holes and centerlines for linear bearing pillow blocks from leading competitors



Watch the product overview video.

Roller pillow block's large cam follower navigates joined shafts and rail assemblies with ease.

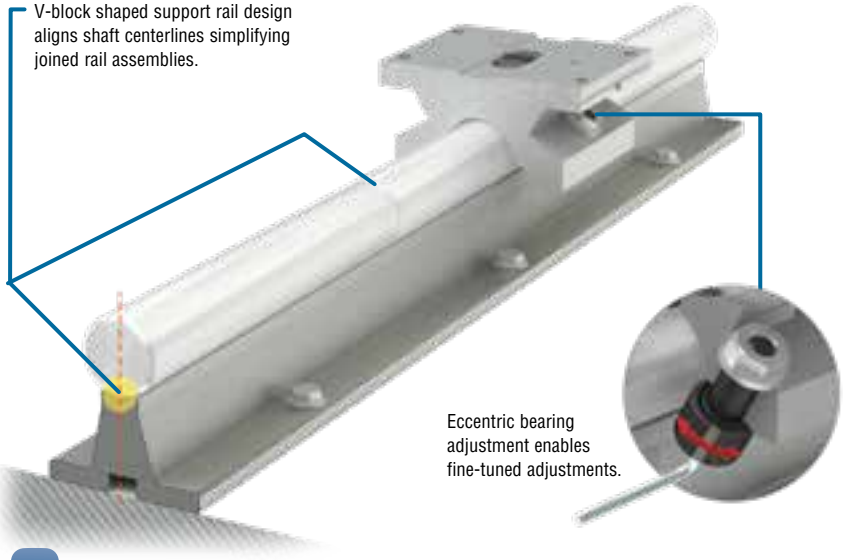
Misalignment of shafts due to installation procedures or non-matched shafts can lead to premature or catastrophic ball bearing failures.

High Performance

- Speeds up to 2.5 times faster than a linear ball bearing pillow block
- Higher dynamic load capacity compared to industry standard linear ball bearing pillow blocks
- Smoother travel equals lower vibration and noise

Lower System Cost

- Simplified installation and alignment
- Floating pillow block option available accommodating up to 0.125" out-of-parallelism, reducing installation time and cost dramatically
- Simple eccentric bearing adjustment allows for tailored bearing fit to application requirements



Consult Factory • 800-221-0811

Note: When a linear ball bearing failure occurs, the shafting is easily damaged and needs to be replaced. When using the roller pillow block, that is not always the case. Consult factory for details.

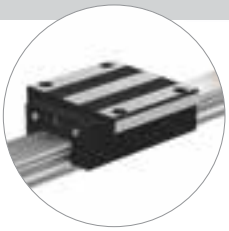
Watch the roller pillow block adjustment video.

Dynamic Load Rating

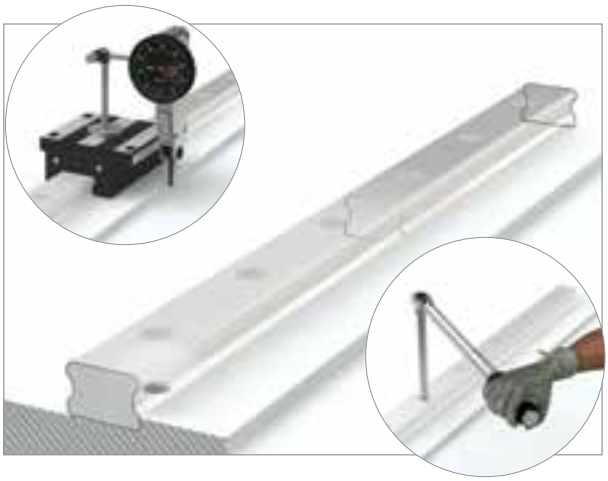
Shaft Diameter	 Open-Style Ball Bearing	 Single Roller Pillow Block	 Double Roller Pillow Block	 Twin Roller Pillow Block
	lbs.	lbs.	lbs.	lbs.
1"	220	955	1910	1910
1.5"	490	1660	3320	3320
2"	858	2400	4800	4800
3"		6260	12520	

Roller Pillow Block Advantage

Profile Rail Technology vs. Roller Pillow Block



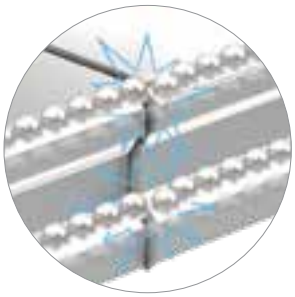
- Superior for high precision applications
- Proper installation requires machining and detailed alignment procedures as highlighted below

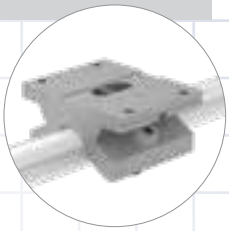


1. Manufacturer guidelines require a machined mounting surface and datum plane—this can be extremely expensive or impractical in long rail lengths
2. Factory-matched rails must be specified when joining guides to ensure precise alignment of running surfaces, adding expense and time
3. Precision tapped mounting holes are required
4. Specified torque sequencing is needed to avoid rail distortion

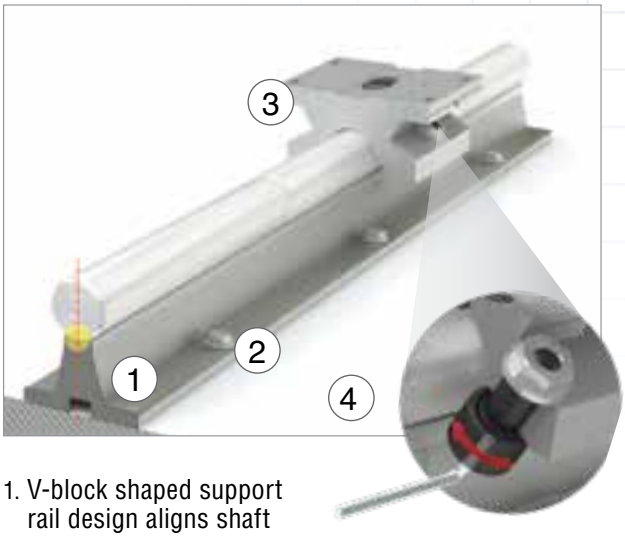
Reliability

- Misalignment of rails due to installation procedures or non-matched rails can lead to premature or catastrophic ball bearing failure





- Superior for joined rail applications
- Low coefficient of friction ideal for heavy load transport applications
- Best suited for horizontal applications with normal downward loading
- Cam followers can be utilized for high speed applications up to 25 feet per second



1. V-block shaped support rail design aligns shaft centerlines simplifying joined rail assemblies
2. Support rail mounts using standard fasteners
3. Floating pillow block option available absorbing up to 0.125" out-of-parallelism reducing installation time and cost dramatically
4. Simple eccentric bearing adjustment allows tailored bearing fit to application requirements

Reliability

- Large cam follower design delivers superior contaminant resistance
- Excels in long travel applications requiring joined shafts or rail assemblies
- Accessories such as lubrication ports and scrapers available for ease of maintenance and Maximum life

Roller Pillow Blocks

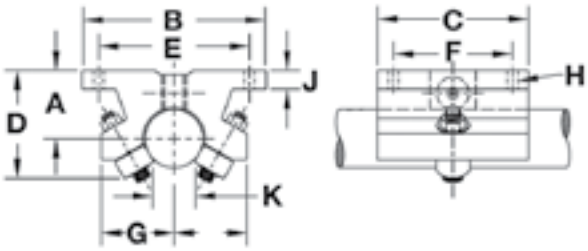
Roller pillow blocks are available in single, double, and twin options in various shaft diameters.

- Loads up to 12500 lbs.
- Self-aligning
- Adjustable
- Corrosion resistant
- High speeds
- Standard mounting holes
- Re-buildable
- Interchangeability with industry standards

Single Roller Pillow Block SPB_OPN

Low-friction single roller pillow blocks are selected for standard linear movement or for situations with shaft deflection. Self-aligning roller pillow blocks can handle a half of a degree in misalignment.

Note: To learn more about turning a curve with a single roller pillow block, please reference the technical information on page 72.



Configure

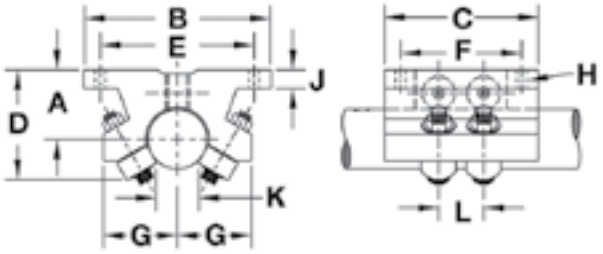
Inch Shafting Dimensions and Load Ratings

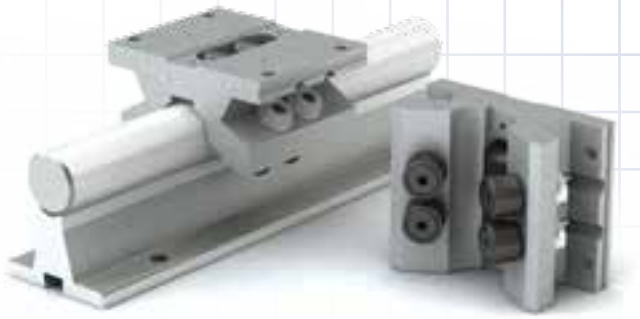
Part No.	Shaft Diameter	Dyn. Load Rating	Weight	A	B	C	D	E	F	G	H		J	K
	in.	lbs.	lbs.	±0.003	in.	in.	in.	±0.005	±0.005	in.	bolt	hole	in.	in.
SPB-08-OPN	1/2	400	0.400	0.687	2	1-1/2	1-5/32	1.688	1.000	1	#6	5/32	0.240	5/16
SPB-10-OPN	5/8	500	0.500	0.875	2-1/2	1-3/4	1-13/32	2.125	1.125	1-1/16	#8	3/16	0.270	3/8
SPB-12-OPN	3/4	600	0.600	0.937	2-3/4	1-7/8	1-9/16	2.375	1.250	1-1/16	#8	3/16	0.303	7/16
SPB-16-OPN	1	955	1.000	1.187	3-1/4	2-5/8	2	2.875	1.750	1-3/8	#10	7/32	0.360	11/16
SPB-20-OPN	1-1/4	1400	2.000	1.500	4	3-3/8	2-9/16	3.500	2.000	1-3/4	#10	7/32	0.424	13/16
SPB-24-OPN	1-1/2	1660	2.800	1.750	4-3/4	3-3/4	2-7/8	4.125	2.500	1-7/8	1/4	9/32	0.474	1-1/16
SPB-32-OPN	2	2400	5.000	2.125	6	4-3/4	3-1/2	5.250	3.250	2-1/2	3/8	13/32	0.600	1-3/8
SPB-48-OPN	3	6260	14.000	3.500	8-3/8	5-1/2	5-1/2	7.000	4.000	3-5/8	5/8	21/32	1.000	2-1/8

Roller Pillow Blocks

Double Roller Pillow Block DPB_OPN

With double the capacity of the single roller pillow block, the double roller pillow blocks offer twice the dynamic load rating in a similar mounting footprint, and are used when longer travel life or an increase in load capacity is required.





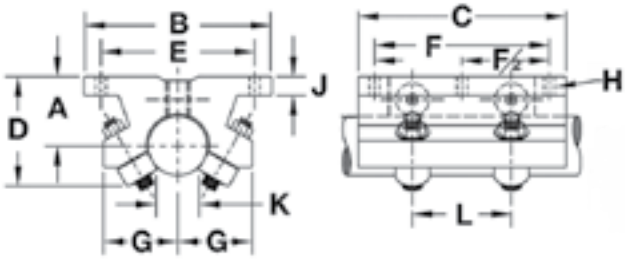
Configure

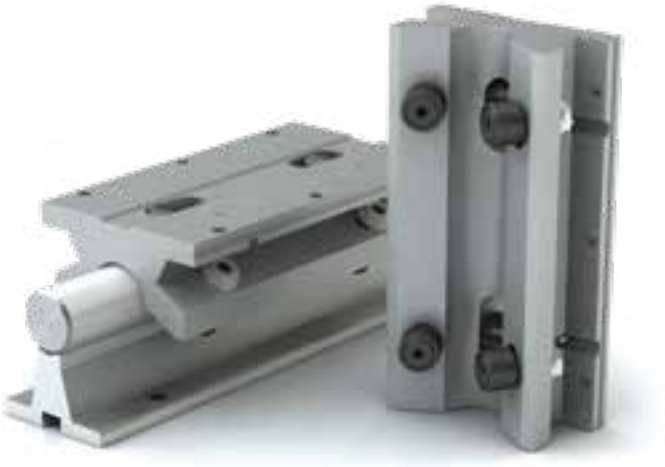
Inch Shafting Dimensions and Load Ratings

Part No.	Shaft Diameter	Dyn. Load Rating	Weight	A	B	C	D	E	F	G	H		J	K	L
	in.	lbs.	lbs.	±0.003	in.	in.	in.	±0.005	±0.005	in.	Bolt	Hole	in.	in.	in.
DPB-08-OPN	1/2	800	0.500	0.687	2	2	1-5/32	1.688	1.625	1	#6	5/32	0.240	5/16	0.562
DPB-10-OPN	5/8	1000	0.700	0.875	2-1/2	2-1/2	1-13/32	2.125	2.000	1-1/16	#8	3/16	0.270	3/8	0.526
DPB-12-OPN	3/4	1200	0.800	0.937	2-3/4	2-5/8	1-9/16	2.375	1.250	1-1/16	#8	3/16	0.300	7/16	0.562
DPB-16-OPN	1	1910	1.200	1.187	3-1/4	2-5/8	2	2.875	1.750	1-3/8	#10	7/32	0.360	11/16	0.720
DPB-20-OPN	1-1/4	2800	2.300	1.500	4	3-3/8	2-9/16	3.500	2.000	1-3/4	#10	7/32	0.424	13/16	0.937
DPB-24-OPN	1-1/2	3320	3.000	1.750	4-3/4	3-3/4	2-7/8	4.125	2.500	1-7/8	1/4	9/32	0.474	1-1/16	0.937
DPB-32-OPN	2	4800	5.500	2.125	6	4-3/4	3-1/2	5.250	3.250	2-1/2	3/8	13/32	0.603	1-3/8	1.187
DPB-48-OPN	3	12520	20.000	3.500	8-3/8	7-1/4	5-1/2	7.000	5.875	3-5/8	5/8	21/32	1.000	2-1/8	2.080

Twin Roller Pillow Block TWN_OPN

The twin roller pillow block load rating is the same as the double and is a good choice when using only one roller pillow block per shaft. The twin model also offers an additional pair of mounting holes.





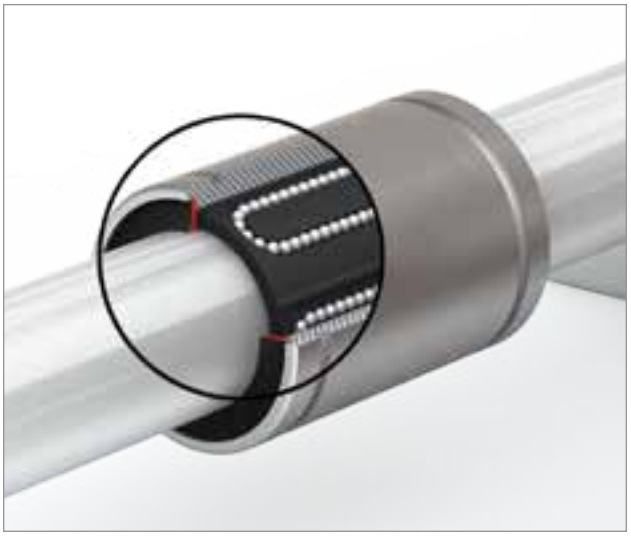
Configure

Inch Shafting Dimensions and Load Ratings

Part No.	Shaft Diameter	Dyn. Load Rating	Weight	A	B	C	D	E	F	G	H		J	K	L
	in.	lbs.	lbs.	±0.003	in.	in.	in.	±0.005	±0.005	in.	Bolt	Hole	in.	in.	in.
TWN-08-OPN	1/2	800	0.800	0.687	2	3-1/2	1-5/32	1.688	2.500	1	#6	5/32	0.240	5/16	1.500
TWN-10-OPN	5/8	1000	1.000	0.875	2-1/2	4	1-13/32	2.125	3.000	1-1/16	#8	3/16	0.270	3/8	2.125
TWN-12-OPN	3/4	1200	1.200	0.937	2-3/4	4-1/2	1-9/16	2.375	3.500	1-1/16	#8	3/16	0.300	7/16	2.500
TWN-16-OPN	1	1910	2.300	1.187	3-1/4	6	2	2.875	4.500	1-3/8	#10	7/32	0.360	11/16	3.750
TWN-20-OPN	1-1/4	2800	4.400	1.500	4	7-1/2	2-9/16	3.500	5.500	1-3/4	#10	7/32	0.424	13/16	4.625
TWN-24-OPN	1-1/2	3320	6.500	1.750	4-3/4	9	2-7/8	4.125	6.500	1-7/8	1/4	9/32	0.474	1-1/16	5.500
TWN-32-OPN	2	4800	12.400	2.125	6	12	3-1/2	5.250	10.500	2-1/2	3/8	13/32	0.600	1-3/8	8.250

Ball Bearings Overview

Product Overview



High Precision and Rigidity

The Simplicity® ball bearing is produced from a solid steel outer cylinder and incorporates an industrial strength polymer retainer.

Ease of Assembly

The standard type of linear ball bearing can be loaded from any direction. Precision control is possible using only the shaft supporter, and the mounting surface can be machined easily.

Ease of Replacement

Linear ball bearings of each type are completely interchangeable because of their standardized dimensions and strict precision control. Replacement because of wear or damage is therefore easy and accurate.

Materials

Ball bearings consist of an outer cylinder, ball retainer, balls, double seals, and two end rings. The ball retainer which holds the balls in the recirculating tracks is held inside the outer cylinder by end rings.

- Parts are assembled to optimize their required functions.
- The outer shell is heat treated to ensure long life.
- The ball retainer is molded from a durable polymer to ensure smooth and quiet motion.
- Double seals are standard.

Variety of Types

LEE offers a full line of ball bearings that include:

- Inch, ISO Metric
- Self-aligning ball bearings in Inch and ISO Metric sizes
- Double wide in Inch and ISO Metric
- Square and round flange in ISO Metric
- Double wide square and round flange in ISO Metric
- Double wide with center flange location in ISO Metric
- Pillow blocks, open and closed, in Inch and ISO Metric
- Double wide pillow blocks in Inch sizes

Note: JIS sizes avaiable opon request

Only certified 60 Plus Shafting provides Maximum linear bearing performance.

Inch Series–page 3 Metric Series–page 40

Ball Bearings Overview

Linear ball bearings are available in a variety of configurations designed to meet a range of application needs.

Bearings – IP and EP (Inch and ISO)

- Solid steel outer shell

Pillow Blocks – IPP and EPP (Inch and ISO Metric)

- Aluminum housing with bearing insert
- Industrial strength polymer ball retainer
- End rings with integrated seals standard
- Used in standard LEE pillow blocks that supply 1/2° self-alignment in all directions
- Excellent rigidity while providing smooth, quiet operation

IPS and EPS Series

- Outer shell is of high strength polymer
- Ball bearing raceway inserts are hardened steel
- Inserts allow smooth ball rotation while maintaining even preload with the shaft or inner race
- Inserts provide 1/2° self-alignment in all directions when used in a straight bore pillow block or housing
- Provide increased load capacity and life in a lightweight design

Flanged Bearings – EP (ISO)

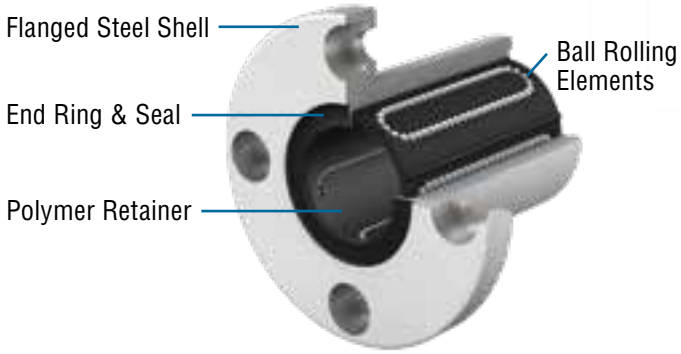
- Solid steel outer shell
- Industrial strength polymer ball retainer
- End rings with integrated seals standard
- Excellent rigidity while providing smooth, quiet operation

Note: JIS sizes avaiable opon request

IP, EP Series

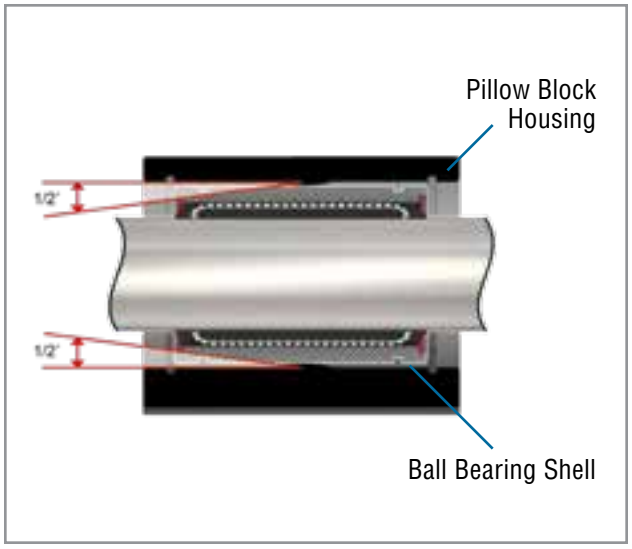
IPS Series

IP, EP Series



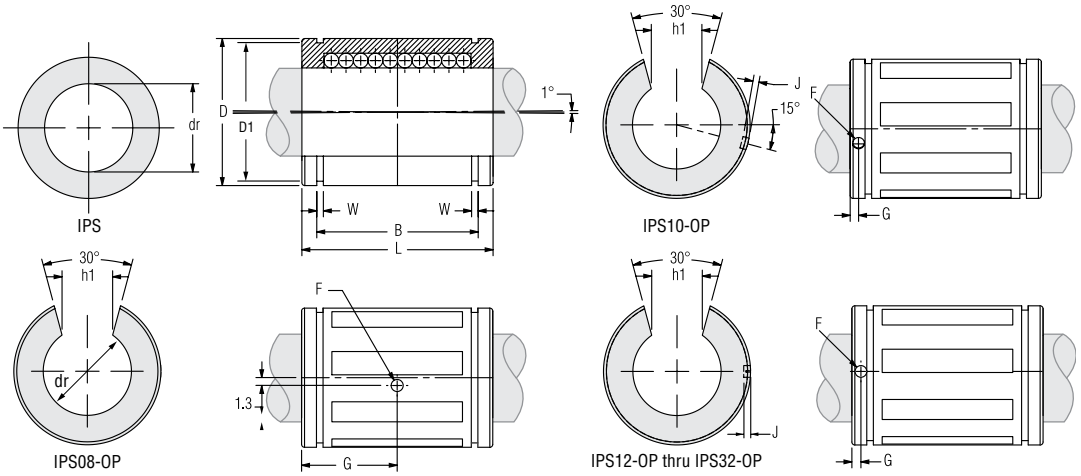
Self-Aligning Pillow Blocks

- Pillow blocks combine linear ball bearings with LEE's self aligning pillow block to compensate for misalignment or shaft deflection in the application
- Used in standard LEE pillow blocks that supply 1/2° self-alignment in all directions
- Straight bore pillow blocks are also available for applications which demand more rigidity
- LEE Linear's bearings are size interchangeable with industry standard ball bearings and with Simplicity plain bearings



Linear Ball Bearings

Precision Plus Aligning Ball Bearings IPS & IPS_-OP



IPS – Self Aligning Closed

IPSxx-OP – Self Aligning Open

Configure

Dimensional Information

Part No.		Nominal Diameter					Major Dimensions & Tolerances							Load Ratings	
Self Aligning Closed	Retired Part No.	Size	dr	Tolerance	Ball Circuit	Weight	D	L	Tolerance	B	Tolerance	W	D1	Dynamic C	Static Co
		In.	in.	in.		lbs	in.	in.	in.	in.	in.	in.	in.	lbf	lbf
IPS04	SU04B	1/4	0.2500	0/-.0005	4	.009	0.5000	0.7500	0/-.015	0.515	0/-.015	0.0390	0.4687	60	80
IPS06	SU06B	3/8	0.3750	0/-.0005	4	.014	0.6250	0.8750	0/-.015	0.703	0/-.015	0.0390	0.5880	95	120
IPS08	SU08B	1/2	0.5000	0/-.0005	4	.043	0.8750	1.2500	0/-.020	1.032	0/-.020	0.0459	0.8209	230	290
IPS10	SU10B	5/8	0.6250	0/-.0005	5	.103	1.1250	1.5000	0/-.020	1.112	0/-.020	0.0559	1.0590	400	500
IPS12	SU12B	3/4	0.7500	0/-.0005	6	.123	1.2500	1.6250	0/-.020	1.272	0/-.020	0.0559	1.1760	470	590
IPS16	SU16B	1	1.0000	0/-.0005	6	.265	1.5625	2.2500	0/-.020	1.886	0/-.020	0.0679	1.4687	850	1060
IPS20	SU20B	1-1/4	1.2500	0/-.0006	6	.485	2.0000	2.6250	0/-.025	2.011	0/-.025	0.0679	1.8859	1230	1530
IPS24	SU24B	1-1/2	1.5000	0/-.0006	6	.750	2.3750	3.0000	0/-.030	2.422	0/-.030	0.0859	2.2389	1480	1850
IPS32	**NEW**	2	2.0000	0/-.0008	6	1.411	3.0000	4.0000	0/-.040	3.206	0/-.040	0.1029	2.8379	2430	3040

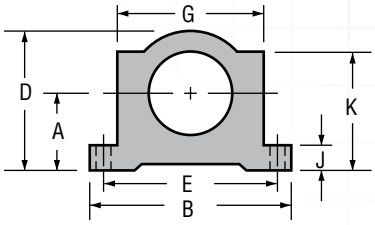
Dimensional Information

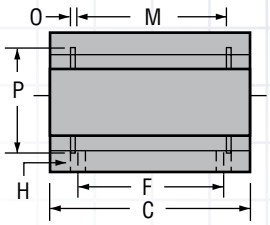
Part No.		Nominal Diameter					Major Dimensions & Tolerances											Load Ratings	
Self Aligning Open	Retired Part No.	Size	dr	Tolerance	Ball Circuit	Weight	D	L	Tolerance	B	Tolerance	W	D1	h1	F	G	J	Dynamic C	Static Co
		In.	in.	in.		lbs	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	lbf	lbf
IPS08-OP	SU08OPB	1/2	0.5000	0/-.0005	3	.033	0.8750	1.2500	0/-.020	1.032	0/-.020	0.0459	0.8209	.313	.136	.6250	through	230	290
IPS10-OP	SU10OPB	5/8	0.6250	0/-.0005	4	.083	1.1250	1.5000	0/-.020	1.112	0/-.020	0.0559	1.0590	.375	.105	.1250	.0390	400	500
IPS12-OP	SU12OPB	3/4	0.7500	0/-.0005	5	.102	1.2500	1.6250	0/-.020	1.272	0/-.020	0.0559	1.1760	.438	.136	.1250	.0590	470	590
IPS16-OP	SU16OPB	1	1.0000	0/-.0005	5	.220	1.5625	2.2500	0/-.020	1.886	0/-.020	0.0679	1.4687	.563	.136	.1250	.0470	850	1060
IPS20-OP	SU20OPB	1-1/4	1.2500	0/-.0006	5	.419	2.0000	2.6250	0/-.025	2.011	0/-.025	0.0679	1.8859	.625	.201	.1875	.0900	1230	1530
IPS24-OP	SU24OPB	1-1/2	1.5000	0/-.0006	5	.639	2.3750	3.0000	0/-.030	2.422	0/-.030	0.0859	2.2389	.750	.201	.1875	.0900	1480	1850
IPS32-OP	**NEW**	2	2.0000	0/-.0008	5	1.168	3.0000	4.0000	0/-.040	3.206	0/-.040	0.1029	2.8379	1.000	.265	.3125	through	2430	3040

Linear Ball Bearings Precision Plus Linear Pillow Blocks

LEE Linear Precision Plus Linear Pillow Blocks offer all the advantages of bearings in a complete pillow block.

Closed Pillow Blocks IPPS_G

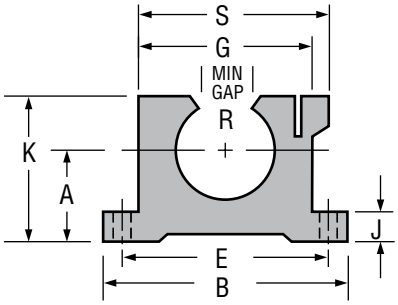


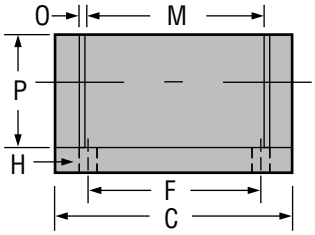


Dimensional Information

Part No.	Retired Part No.	NOM. BRG. I.D.	A	B	C	D	E	F	G	H		J	k	M	O	P	Mass (b)	Load Rating (lbf)
			Centerline						Body			Flange		GRV.	GRV.	GRV.		
		In.	+/- .001	Width	Length	Height	+/- .010	+/-.010	Width	Bolt	Hole	Thick		Space	Width	Dia.		
IPPS08G	SPB08B	1/2	0.687	2.000	1.69	1.250	1.688	1.000	1.375	#6	5/32"	0.250	1.125	1.250	0.046	0.931	0.200	230
IPPS10G	SPB10B	5/8	0.875	2.500	1.94	1.625	2.125	1.125	1.750	#8	3/16"	0.281	1.438	1.500	0.056	1.197	0.500	400
IPPS12G	SPB12B	3/4	0.937	2.750	2.06	1.750	2.375	1.250	1.875	#8	3/16"	0.313	1.563	1.625	0.056	1.330	0.600	470
IPPS16G	SPB16B	1	1.187	3.250	2.81	2.188	2.875	1.750	2.375	#10	7/32"	0.375	1.938	2.250	0.068	1.671	1.200	850
IPPS20G	SPB20B	1-1/4	1.500	4.000	3.63	2.813	3.500	2.000	3.000	#10	7/32"	0.438	2.500	2.625	0.068	2.122	2.500	1230
IPPS24G	SPB24B	1-1/2	1.750	4.750	4.00	3.250	4.125	2.500	3.500	1/4"	9/32"	0.500	2.875	3.000	0.086	2.519	3.800	1480

Open Pillow Blocks IPPSN_G



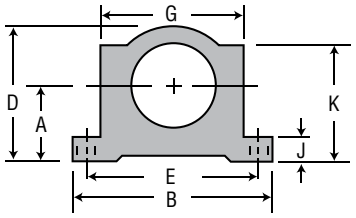


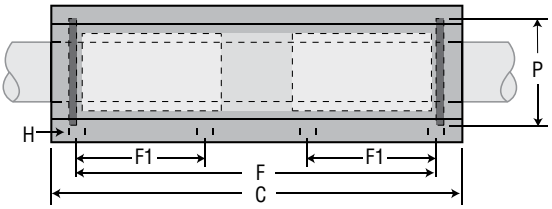
Dimensional Information

Part No.	Retired Part No.	NOM. BRG. I.D.	A	B	C	E	F	G	H		J	K	M	O	P	R	Mass (b)	Load Rating (lbf)
			Centerline					Body			Flange		GRV.	GRV.	GRV.	MIN		
		In.	+/-.001	Width	Length	+/-.010	+/-.010	Width	Bolt	Hole	Thick	Height	Space	Width	Dia.	Open		
IPPSN08G	SPB08OPB	1/2	0.687	2.000	1.50	1.688	1.000	1.375	#6	5/32"	0.250	1.125	1.250	0.046	0.931	0.313	0.200	230
IPPSN10G	SPB10OPB	5/8	0.875	2.500	1.75	2.125	1.125	1.750	#8	3/16"	0.281	1.438	1.500	0.056	1.197	0.375	0.400	400
IPPSN12G	SPB12OPB	3/4	0.937	2.750	1.88	2.375	1.250	1.875	#8	3/16"	0.313	1.563	1.625	0.056	1.330	0.438	0.500	470
IPPSN16G	SPB16OPB	1	1.187	3.250	2.63	2.875	1.750	2.375	#10	7/32"	0.375	1.938	2.250	0.068	1.671	0.563	1.000	850
IPPSN20G	SPB20OPB	1-1/4	1.500	4.000	3.38	3.500	2.000	3.000	#10	7/32"	0.438	2.500	2.625	0.068	2.122	0.625	2.100	1230
IPPSN24G	SPB24OPB	1-1/2	1.750	4.750	3.75	4.125	2.500	3.500	1/4"	9/32"	0.500	2.875	3.000	0.086	2.519	0.750	3.200	1480

Linear Ball Bearings Precision Plus Linear Pillow Blocks

Closed Twin Pillow Blocks IPPSW_G

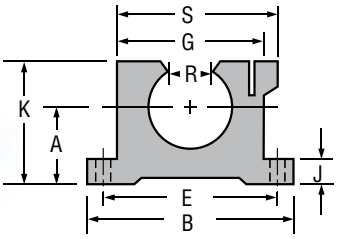


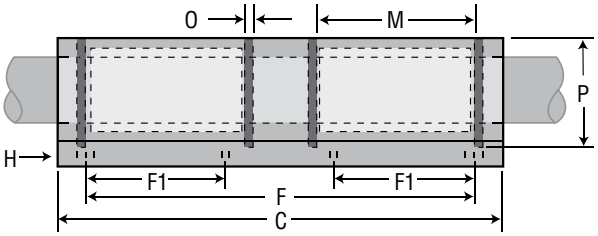


Dimensional Information

Part No.	Retired Part No.	NOM. BRG. I.D.	A	B	C	D	E	F	F1	G	H		J	k	P	Mass (b)	Load Rating (lbf)
			Centerline							Body			Flange		GRV.		
		In.	+/- .001	Width	Length	Height	+/- .010	+/-.010	+/-.010	Width	Bolt	Hole	Thick		Dia.		
IPPSW08G	TWN8B	1/2	0.687	2.000	3.500	1.250	1.6880	2.5000	1.000	1.375	#6	5/32"	0.250	1.125	0.931	0.50	460
IPPSW10G	TWN10B	5/8	0.875	2.500	4.000	1.625	2.1250	3.0000	1.125	1.750	#8	3/16"	0.281	1.438	1.197	1.00	800
IPPSW12G	TWN12B	3/4	0.937	2.750	4.500	1.750	2.3750	3.5000	1.250	1.875	#8	3/16"	0.313	1.563	1.330	1.20	940
IPPSW16G	TWN16B	1	1.187	3.250	6.000	2.188	2.8750	4.5000	1.750	2.375	#10	7/32"	0.375	1.938	1.671	2.20	1700
IPPSW20G	TWN20B	1-1/4	1.500	4.000	7.500	2.813	3.5000	5.5000	2.000	3.000	#10	7/32"	0.438	2.500	2.122	4.50	2460
IPPSW24G	TWN24B	1-1/2	1.750	4.750	9.000	3.250	4.1250	6.5000	2.500	3.500	1/4"	9/32"	0.500	2.875	2.519	6.30	2958

Open Twin Pillow Blocks IPPSWN_G





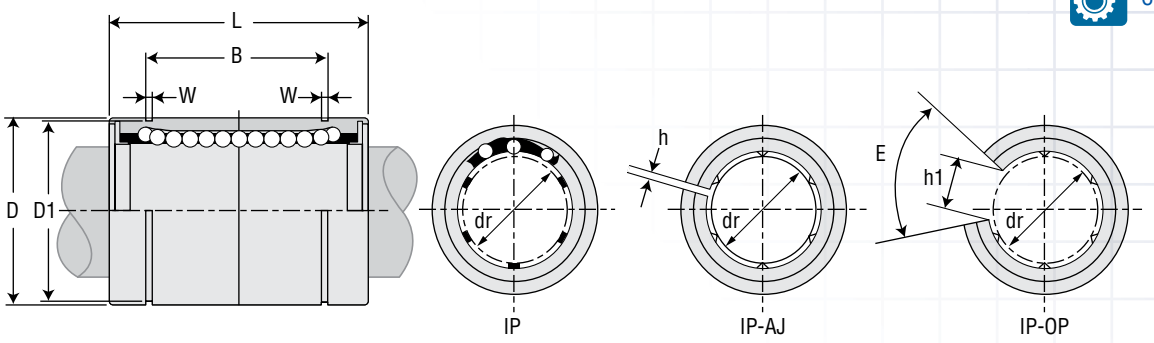
Dimensional Information

Part No.	Retired Part No.	NOM. BRG. I.D.	A	B	C	E	F	F1	G	H		J	K	M	O	P	R	Mass (b)	Load Rating (lbf)
			Centerline						Body			Flange		GRV.	GRV.	GRV.	MIN		
		In.	+/-.001	Width	Length	+/-.010	+/-.010	+/-.010	Width	Bolt	Hole	Thick	Height	Space	Width	Dia.	Open		
IPPSWN08G	TWN08OPB	1/2	0.687	2.000	3.500	1.688	2.500	1.000	1.375	#6	5/32"	0.250	1.125	1.250	0.046	0.931	0.313	0.40	460
IPPSWN10G	TWN10OPB	5/8	0.875	2.500	4.000	2.125	3.000	1.125	1.750	#8	3/16"	0.281	1.438	1.500	0.056	1.197	0.375	0.80	800
IPPSWN12G	TWN12OPB	3/4	0.937	2.750	4.500	2.375	3.500	1.250	1.875	#8	3/16"	0.313	1.563	1.625	0.056	1.330	0.438	1.00	940
IPPSWN16G	TWN16OPB	1	1.187	3.250	6.000	2.875	4.500	1.750	2.375	#10	7/32"	0.375	1.938	2.250	0.068	1.671	0.563	2.00	1700
IPPSWN20G	TWN20OPB	1-1/4	1.500	4.000	7.500	3.500	5.500	2.000	3.000	#10	7/32"	0.438	2.500	2.625	0.068	2.122	0.625	4.00	2460
IPPSWN24G	TWN24OPB	1-1/2	1.750	4.750	9.000	4.125	6.500	2.500	3.500	1/4"	9/32"	0.500	2.875	3.000	0.086	2.519	0.750	6.00	2958

Precision Linear Ball Bearings

Ball Bearings IP

Configure



IP – Standard Closed

IPxx-AJ – Adjustable

IPxx-OP – Standard Open

Dimensional Information

(Standard Steel Finish)

Part No.					Nominal Diameter			Ball Circuit	Weight	Major Dimensions & Tolerances					
Standard Closed	Retired Part No. Closed	Adjustable	Standard Open	Retired Part No. Open	Size	dr	Tolerance			D	Tolerance	L	Tolerance	B	Tolerance
					in.	in.	in.		g	in.	in.	in.	in.	in.	in.
IP4G	A4812	–	–	–	1/4	0.2500	0/-.0005	4	8	0.5000	0/-.00045	0.7500	0/-.008	0.5110	0/-.008
IP6G	A61014	–	–	–	3/8	0.3750	0/-.0005	4	15	0.6250	0/-.00050	0.8750	0/-.008	0.6358	0/-.008
IP8G	A81420	IP8G-AJ	IP8G-OP	OPN81420	1/2	0.5000	0/-.0005	4	42	0.8750	0/-.00050	1.2500	0/-.008	0.9625	0/-.008
IP10G	A101812	IP10G-AJ	IP10G-OP	OPN101812	5/8	0.6250	0/-.0005	5	85	1.1250	0/-.00050	1.5000	0/-.008	1.1039	0/-.008
IP12G	A122026	IP12G-AJ	IP12G-OP	OPN122026	3/4	0.7500	0/-.0005	5	104	1.2500	0/-.00065	1.6250	0/-.008	1.1657	0/-.008
IP16G	A162536	IP16G-AJ	IP16G-OP	OPN162536	1	1.0000	0/-.0005	6	220	1.5625	0/-.00065	2.2500	0/-.12	1.7547	0/-.12
IP20G	A203242	IP20G-AJ	IP20G-OP	OPN203242	1-1/4	1.2500	0/-.0006	6	465	2.0000	0/-.00075	2.6250	0/-.12	2.0047	0/-.12
IP24G	A243848	IP24G-AJ	IP24G-OP	OPN243848	1-1/2	1.5000	0/-.0006	6	720	2.3750	0/-.00075	3.0000	0/-.12	2.4118	0/-.12
IP32G	A324864	IP32G-AJ	IP32G-OP	OPN324864	2	2.0000	0/-.0008	6	1310	3.0000	0/-.00090	4.0000	0/-.12	3.1917	0/-.12

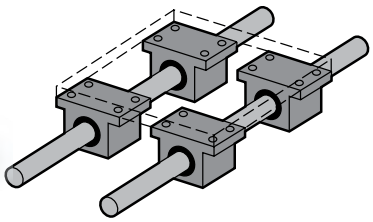
Part No.			Nominal Diameter			Major Dimensions & Tolerances							Load Ratings	
Standard Closed	Adjustable	Standard Open	Size	dr	Tolerance	W	D1	h	h1	E Slot Angle	MAX Eccentricity	MAX Radial Clearance	Dynamic C	Static CO
			In.	in.	in.	in.	in.	in.	in.		in.	in.	lbf	lbf
IP4G	-	-	1/4	0.2500	0/-.0005	.0390	0.4687	-	-	-	0.0004	-0.0001	46	59
IP6G	-	-	3/8	0.3750	0/-.0005	.0390	0.5880	-	-	-	0.0004	-0.0001	50	70
IP8G	IP8G-AJ	IP8G-OP	1/2	0.5000	0/-.0005	.0459	0.8209	.06	0.3400	80°	0.0004	-0.0001	114	176
IP10G	IP10G-AJ	IP10G-OP	5/8	0.6250	0/-.0005	.0559	1.0590	.06	0.3750	80°	0.0004	-0.0001	174	265
IP12G	IP12G-AJ	IP12G-OP	3/4	0.7500	0/-.0005	.0559	1.1760	.06	0.4375	60°	0.0005	-0.0002	193	307
IP16G	IP16G-AJ	IP16G-OP	1	1.0000	0/-.0005	.0679	1.4687	.06	0.5625	50°	0.0005	-0.0002	220	352
IP20G	IP20G-AJ	IP20G-OP	1-1/4	1.2500	0/-.0006	.0679	1.8859	.10	0.6250	50°	0.0007	-0.0003	352	615
IP24G	IP24G-AJ	IP24G-OP	1-1/2	1.5000	0/-.0006	.0859	2.2389	.12	0.7500	50°	0.0007	-0.0003	490	903
IP32G	IP32G-AJ	IP32G-OP	2	2.0000	0/-.0008	.1029	2.8379	.12	1.000	50°	0.0009	-0.0005	858	1784

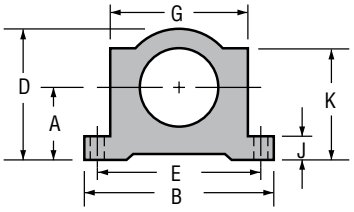
Only certified 60 Plus Shafting provides Maximum linear bearing performance.

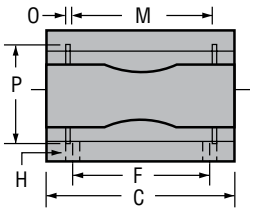
Inch Series–page 3 Metric Series–page 40

Linear Ball Bearings Pillow Blocks

Ball Bearings – Closed Pillow Blocks IPP_G





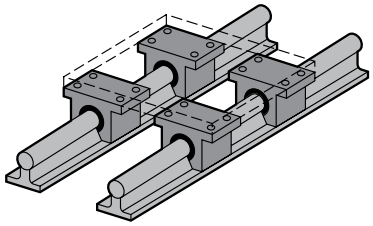


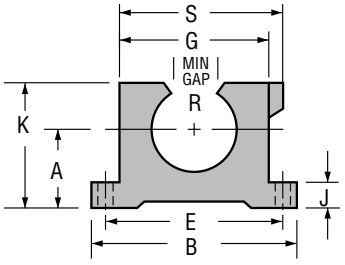
Part No.	Nom. brg. DIA.	a	b	c	d	e	f	g	h		j	k	m	o	p	Smalley Ret. Ring Part No.	Assem. wt.	Load Ratings LBF	
Precision	in.	Centerline +/-.001	Width	Length	Height	+/-.010	+/-.010	Body Width	Bolt	Hole	FLNG. Thick	Height	GRV. Space	GRV. Width	GRV. Dia.		lbs.	Dynamic C	Static CO
IPP04G	1/4	0.437	1.625	1.19	0.813	1.3120	0.7500	1.000	#6	5/32"	0.188	0.750	0.750	0.039	0.532	WH-51	0.099	46	59
IPP06G	3/8	0.500	1.750	1.31	0.938	1.4370	0.8750	1.125	#6	5/32"	0.188	0.875	0.875	0.039	0.665	WH-65	0.129	50	70
IPP08G	1/2	0.687	2.000	1.69	1.250	1.6880	1.0000	1.375	#6	5/32"	0.250	1.125	1.250	0.046	0.931	WH-90	0.250	114	176
IPP10G	5/8	0.875	2.500	1.94	1.625	2.1250	1.1250	1.750	#8	3/16"	0.281	1.438	1.500	0.056	1.197	WH-115	0.500	174	265
IPP12G	3/4	0.937	2.750	2.06	1.750	2.3750	1.2500	1.875	#8	3/16"	0.313	1.563	1.625	0.056	1.330	WH-128	0.580	193	307
IPP16G	1	1.187	3.250	2.81	2.188	2.8750	1.7500	2.375	#10	7/32"	0.375	1.938	2.250	0.068	1.671	WH-156	1.000	220	352
IPP20G	1-1/4	1.500	4.000	3.63	2.813	3.5000	2.0000	3.000	#10	7/32"	0.438	2.500	2.625	0.068	2.122	WH-200	2.000	352	615
IPP24G	1-1/2	1.750	4.750	4.00	3.250	4.1250	2.5000	3.500	1/4"	9/32"	0.500	2.875	3.000	0.086	2.519	WH-237	3.000	490	903
IPP32G	2	2.125	6.000	5.00	4.063	5.2500	3.2500	4.500	3/8"	13/32"	0.625	3.625	4.000	0.103	3.182	WH-300	6.500	858	1784

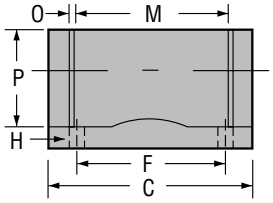
Notes: (1) Standard, pre-assembled pillow blocks include self-aligning housing and precision bearing.
(2) All standard pillow blocks use standard IP series bearings.
(3) Straight bore, pre-assembled pillow blocks use standard IP series bearing.

Configure

Ball Bearings – Open Pillow Blocks IPPN_G







Part No.	Nom. Brg. DIA.	A	B	C	E	F	G	H		J	K	M	O	P	R	Eaton Ret. Ring Part No.	Assem. WT.	S	Load Ratings LBF	
Precision	in.	Centerline +/-.001	Width +/-.010	Length	+/-.010	+/-.010	Body Width	Bolt	Hole	FLNG Thick	Height	GRV. Space	GRV. Width	GRV. Dia.	MIN Open		lbs.	Overall Width	Dynamic C	Static CO
IPPN08G	1/2	0.687	2.000	1.50	1.6880	1.0000	1.375	#6	5/32"	0.250	1.125	1.250	0.046	0.931	0.313	MNAN-87	0.250	1.438	114	176
IPPN10G	5/8	0.875	2.500	1.75	2.1250	1.1250	1.750	#8	3/16"	0.281	1.438	1.500	0.056	1.197	0.375	MNAN-112	0.500	1.813	174	265
IPPN12G	3/4	0.937	2.750	1.88	2.3750	1.2500	1.875	#8	3/16"	0.313	1.563	1.625	0.056	1.330	0.438	MNAN-125	0.580	1.938	193	307
IPPN16G	1	1.187	3.250	2.63	2.8750	1.7500	2.375	#10	7/32"	0.375	1.938	2.250	0.068	1.671	0.563	MNAN-156	1.000	2.438	220	352
IPPN20G	1-1/4	1.500	4.000	3.38	3.5000	2.0000	3.000	#10	7/32"	0.438	2.500	2.625	0.068	2.122	0.625	MNAN-200	2.000	3.125	352	615
IPPN24G	1-1/2	1.750	4.750	3.75	4.1250	2.5000	3.500	1/4"	9/32"	0.500	2.875	3.000	0.086	2.519	0.750	MNAN-237	3.000	3.625	490	903
IPPN32G	2	2.125	6.000	4.75	5.2500	3.2500	4.500	3/8"	13/32"	0.625	3.625	4.000	0.103	3.182	1.000	MNAN-300	6.500	4.688	858	1784

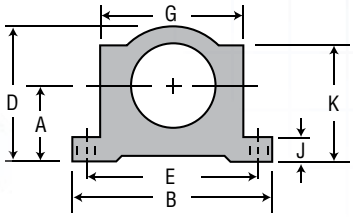
Notes: (1) Standard, pre-assembled pillow blocks include self-aligning housing and precision bearing.
(2) All standard pillow blocks use standard IP series bearings.

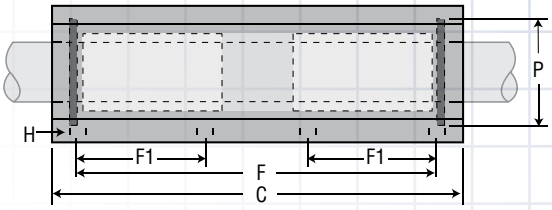
Only certified 60 Plus Shafting provides Maximum linear bearing performance.

Inch Series–page 3 Metric Series–page 40

Linear Ball Bearings Twin Pillow Blocks

Ball Bearings – Twin Closed Pillow Blocks IPPW_G



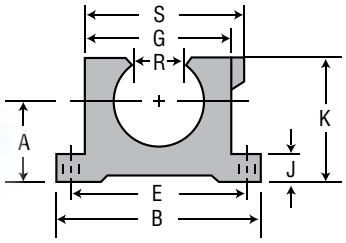


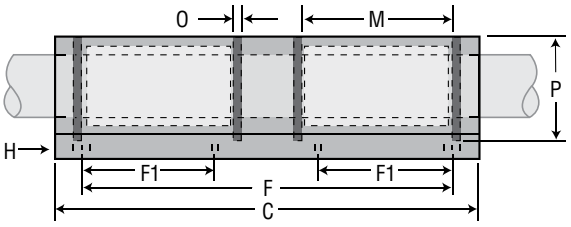
Part No.	Nom. Brg. DIA.	A	B	C	D	E	F	F1	G	H		J	K	P	Smalley Ret. Ring Part No.	Assem. WT.	Load Ratings LBF	
Precision	In.	Centerline +/-.001	Width	Length	Height	+/-.010	+/-.010	+/-.010	Body Width	Bolt	Hole	Thick	Height	GRV. Dia		lbs.	Dynamic C	Static CO
IPPW04G	1/4	0.437	1.625	2.500	0.813	1.3120	2.0000	.750	1.000	#6	5/32"	0.188	0.750	0.532	WH-51	0.197	92	118
IPPW06G	3/8	0.500	1.750	2.750	0.938	1.4370	2.2500	.875	1.125	#6	5/32"	0.188	0.875	0.665	WH-65	0.258	100	140
IPPW08G	1/2	0.687	2.000	3.500	1.250	1.6880	2.5000	1.000	1.375	#6	5/32"	0.250	1.125	0.931	WH-90	0.500	228	352
IPPW10G	5/8	0.875	2.500	4.000	1.625	2.1250	3.0000	1.125	1.750	#8	3/16"	0.281	1.438	1.197	WH-115	1.000	348	530
IPPW12G	3/4	0.937	2.750	4.500	1.750	2.3750	3.5000	1.250	1.875	#8	3/16"	0.313	1.563	1.330	WH-128	1.125	386	614
IPPW16G	1	1.187	3.250	6.000	2.188	2.8750	4.5000	1.750	2.375	#10	7/32"	0.375	1.938	1.671	WH-156	2.188	440	704
IPPW20G	1-1/4	1.500	4.000	7.500	2.813	3.5000	5.5000	2.000	3.000	#10	7/32"	0.438	2.500	2.122	WH-200	4.250	704	1230
IPPW24G	1-1/2	1.750	4.750	9.000	3.250	4.1250	6.5000	2.500	3.500	1/4"	9/32"	0.500	2.875	2.519	WH-237	6.375	980	1806
IPPW32G	2	2.125	6.000	10.000	4.063	5.2500	8.2500	3.250	4.500	3/8"	13/32"	0.625	3.625	3.182	WH-300	13.500	1716	3568

Notes: (1) All standard pillow blocks use standard IP series bearings.
(2) Twin closed pillow blocks are not self-aligning.

Configure

Ball Bearings – Twin Open Pillow Blocks IPPWN_G



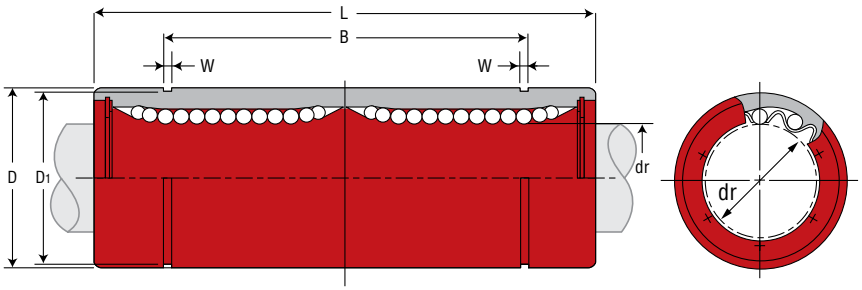


Part No.	Nom. Brg. Dia.	A	B	C	E	F	F1	G	H		J	K	M	O	P	R	Eaton Ret. Ring Part No.	Assem. WT.	S	Load Ratings LBF	
Precision	in.	Centerline +/-.001	Width	Length	+/- .010	+/- .010	+/- .010	Body Width	Bolt	Hole	FLNG. Thick	Height	GRV. Space	GRV. Wide	GRV. Dia.	MIN Open		lbs.	Overall Width	Dynamic C	Static CO
IPPWN08G	1/2	0.687	2.000	3.500	1.6880	2.5000	1.000	1.375	#6	5/32"	0.250	1.125	1.250	0.046	0.931	0.313	MNAN-87	0.400	1.438	228	352
IPPWN10G	5/8	0.875	2.500	4.000	2.1250	3.0000	1.125	1.750	#8	3/16"	0.281	1.438	1.500	0.056	1.197	0.375	MNAN-112	0.910	1.813	348	530
IPPWN12G	3/4	0.937	2.750	4.500	2.3750	3.5000	1.250	1.875	#8	3/16"	0.313	1.563	1.625	0.056	1.330	0.438	MNAN-125	1.060	1.938	386	614
IPPWN16G	1	1.187	3.250	6.000	2.8750	4.5000	1.750	2.375	#10	7/32"	0.375	1.938	2.250	0.068	1.671	0.563	MNAN-156	1.970	2.438	440	704
IPPWN20G	1-1/4	1.500	4.000	7.500	3.5000	5.5000	2.000	3.000	#10	7/32"	0.438	2.500	2.625	0.068	2.122	0.625	MNAN-200	3.725	3.125	704	1230
IPPWN24G	1-1/2	1.750	4.750	9.000	4.1250	6.5000	2.500	3.500	1/4"	9/32"	0.500	2.875	3.000	0.086	2.519	0.750	MNAN-237	5.800	3.625	980	1806
IPPWN32G	2	2.125	6.000	10.000	5.2500	8.2500	3.250	4.500	3/8"	13/32"	0.625	3.625	4.000	0.103	3.182	1.000	MNAN-300	12.125	4.688	1716	3568

Note: All standard pillow blocks use standard IP series bearings.

Linear Ball Bearings Double Wide

Double Wide Ball Bearings IP_GW



Configure

Dimensional Information

(Standard Steel Finish)

Part No.	Nominal Diameter			Ball Circuit	Weight	Major Dimensions & Tolerances					
	Size	dr	Tolerance			D	Tolerance	L	Tolerance	B	Tolerance
Standard Closed	in.	in.	in.		g	in.	in.	in.	in.	in.	in.
IP8GW	1/2	0.5000	0/-.0004	4	80	0.8750	0/-.00065	2.3750	0/-.012	1.9250	0/-.012
IP10GW	5/8	0.6250	0/-.0004	4	160	1.1250	0/-.00065	2.8125	0/-.012	2.2079	0/-.012
IP12GW	3/4	0.7500	0/-.0005	5	195	1.2500	0/-.00075	3.0937	0/-.012	2.3314	0/-.012
IP16GW	1	1.0000	0/-.0005	6	410	1.5625	0/-.00075	4.2813	0/-.016	3.5094	0/-0.16
IP20GW	1-1/4	1.2500	0/-.0006	6	820	2.0000	0/-.00090	5.0000	0/-.016	4.0094	0/-0.16
IP24GW	1-1/2	1.5000	0/-.0006	6	1250	2.3750	0/-.00090	5.6875	0/-.016	4.8236	0/-0.16
IP32GW	2	2.0000	0/-.0006	6	2350	3.0000	0/-.00100	7.7500	0/-.016	6.3834	0/-0.16

Part No.	Nominal Diameter			Major Dimensions & Tolerances			Load Ratings	
	Size	dr	Tolerance	W	D1	MAX Eccentricity	Dynamic C	Static CO
Standard Closed	In.	in.	in.	in.	in.	in.	lbf	lbf
IP8GW	1/2	0.5000	0/-.0004	.0459	0.8209	0.0005	182	352
IP10GW	5/8	0.6250	0/-.0004	.0559	1.0590	0.0005	276	528
IP12GW	3/4	0.7500	0/-.0005	.0559	1.1760	0.0007	307	615
IP16GW	1	1.0000	0/-.0005	.0679	1.4687	0.0007	352	705
IP20GW	1-1/4	1.2500	0/-.0006	.0679	1.8859	0.0009	562	1234
IP24GW	1-1/2	1.5000	0/-.0006	.0859	2.2389	0.0009	771	1807
IP32GW	2	2.0000	0/-.0006	.1029	2.8379	0.0011	1366	3574

Only certified 60 Plus Shafting provides Maximum linear bearing performance.

Inch Series–page 3 Metric Series–page 40

simplicity®
Plain Bearings Overview

Self-Alignment Feature

Simplicity bearings are available with a standard straight O.D. or a crowned self-aligning O.D.

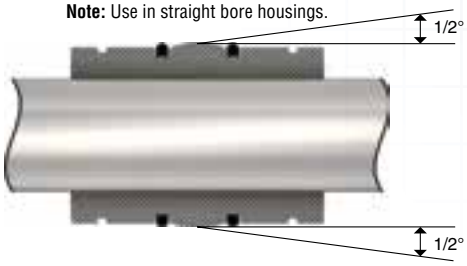
- **FL – (Standard):**
- Straight O.D.
- Standard pillow blocks have the self-aligning capability designed into the block using standard "FL" bearings for the final assembly
- **FLA – (Self-aligning O.D.):**
- Has a crown on the O.D. allowing the bearing to re-align itself in binding situations
- Specifically designed to easily retrofit straight bore housings
- The bearing will allow 1/2° of misalignment capability from centerline (1° overall)
- O-rings are used on either side of the crown to cushion and eliminate clatter in operation

Standard FL – Straight O.D.

Note: Standard pillow blocks use FL bearings with self-alignment built into the I.D. of the block.

Self-Aligning FLA – Spherical O.D.

Note: Use in straight bore housings.

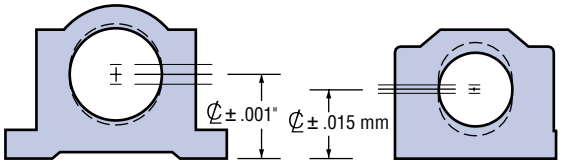


Pillow Blocks

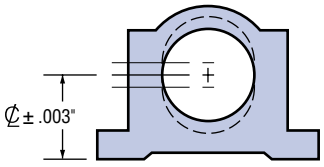
- Made of aluminum alloy
- Pillow blocks are interchangeable with industry standard ball bearing pillow blocks
- Critical centerline dimensions hold accuracy within ±.001" on inch sizes and ±.015 mm on metric sizes

FINISHES:

- Clear anodized finish (Standard)
- **Standard pillow blocks have built-in self-alignment in all directions:**
- Standard pillow blocks have 1/2° misalignment from centerline
- This feature is built into the housing with a spherical radius at the midpoint of the block
- This self-aligning capability will allow for some shaft deflection and misalignment
- **Rigid or straight bore housings are available:**
- This does not allow for any self-alignment and provides a very rigid assembly
- They are typically used in single shaft applications



SIMPLICITY = TIGHTER TOLERANCES

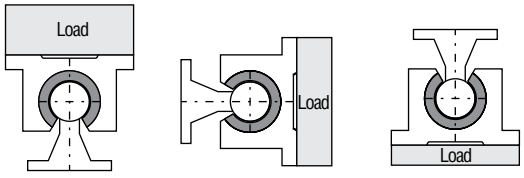


INDUSTRY STANDARD

Open Bearings Orientation

Simplicity bearings can operate in any orientation.

Load capacities will vary on open bearings depending on the orientation in which they are being used.



100% Capacity 70% Capacity 40% Capacity

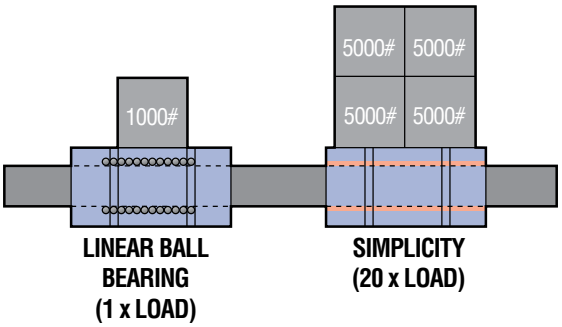
Simplicity® Plain Bearings Overview

Load Capacity Of Liner

Simplicity bearings can carry from 4 to 20 times the load of a linear ball bearing.

Bearing Material	Static Load Capacity
Frelon GOLD®	3000 psi or 210.9 kgf/cm²
Frelon® J / Frelon® W	1500 psi or 105.45 kgf/cm²

- Allows the engineer to maintain performance in a smaller designed package
  Example: Simplicity 1/2" I.D. = 1" I.D. linear ball bearing
- Shock loads and vibration are absorbed
- Metal–to–metal contact is eliminated providing a smoother, quieter running assembly

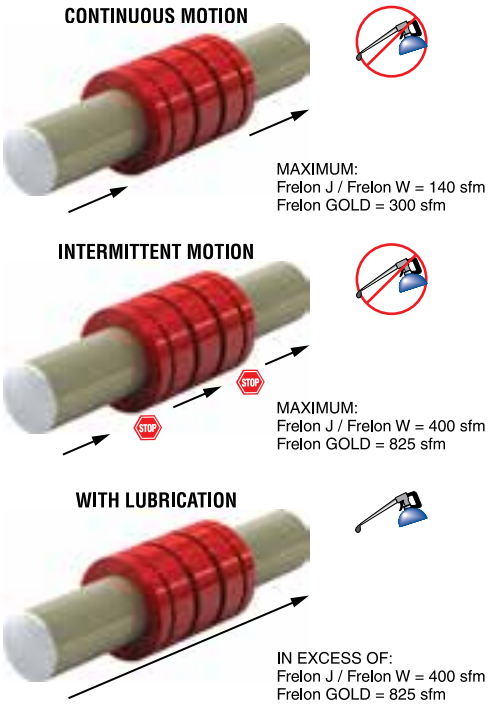


Speed Characteristics

Exceeding these speeds causes frictional heat and accelerates liner wear.

Bearing Material	No Lube Continuous Motion	No Lube Intermittent Motion	With Lubrication*
Frelon GOLD®	300 sfm	825 sfm	825 sfm
	60 in/sec.	165 in./sec.	165 in./sec.
	1.524 m/sec.	4.19 m/sec.	4.19 m/sec.
Frelon® J / Frelon® W	140 sfm	400 sfm	400 sfm
	28 in./sec.	80 in./sec.	80 in./sec.
	.711 m/sec.	2.03 m/sec.	2.03 m/sec.

*Depending on the lubrication used, loads, and frequency of continuous or intermittent motion, speeds can be in excess of the numbers shown.



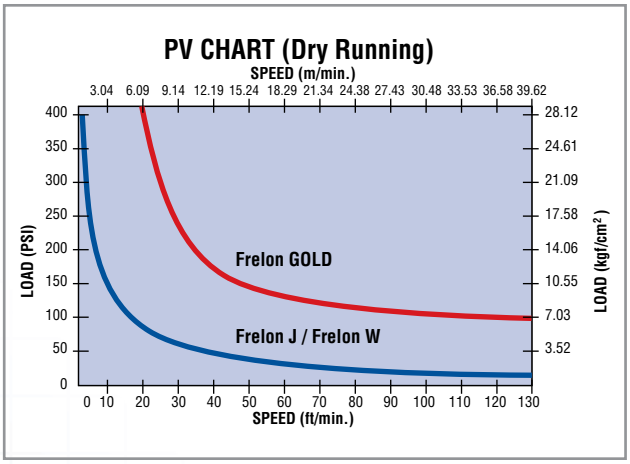
Performance Ratings (for Linear Motion)

Plain bearings are rated by their limiting PV, which is a combination of load over a given surface area and the velocity.

Bearing Material	MAX "PV"	MAX "P"	MAX "V" (No Lubrication)
Frelon GOLD®	20000 (psi) x ft./min.) or 430 (kgf/cm² x m/min.)	3000 psi or 210.9 kgf/cm²	300 sfm or 91.44 m/min.
Frelon® J / Frelon® W	10000 (psi x ft./min.) or 215 (kgf/cm² x m/min.)	1500 psi or 105.45 kgf/cm²	140 sfm or 42.66 m/min.

- **PV** = The performance measurement of plain bearings
- **PV** = P x V where P = pressure (load) in psi (kgf/cm²)
- **V** = velocity (speed) in sfm (m/min.)

Note: All three parameters must be met by an application for the bearing to perform properly.

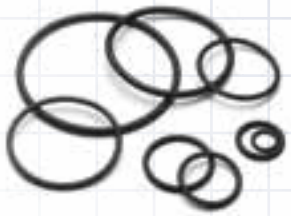


Simplicity® Plain Bearings Overview

O-Rings

Used in standard pillow blocks and with self-aligning bearings.

- **Nitrile Buna 70 (standard)** – A good general purpose rubber that is used in 98% of applications (-65°F to 275°F (-54°C to 135°C)).
- **Viton (special – designate with "V")** – Used only in high temperature applications up to 400°F (up to 204°C).



Seals

Use only in the most contaminated environments.

- **Polymod® (standard)** – A high performance polymer modified material that reduces friction of a standard buna material by 50% and increases wear life.

  Polymod is a registered trademark of Polymod Technologies, Inc.
- **Temperature**: -20°F to +212°F
- **Urethane (special - designate with "U")** – A moly-impregnated urethane scraper that is only for the severest applications - friction is greatly increased!
- **Temperature**: -40 to +200°F
- **Viton™ (special - designate with "V")** – A brand of synthetic rubber and fluoropolymer elastomer used only in high temperature applications.
- **Temperature**: Up to +400°F

Attention: 90% of applications do not require seals when using Simplicity bearings. The liner has a natural ability to wipe particles from the shafting. Any particulate (metal, sand, etc.) that does enter the bearing will embed itself into the soft liner not scoring the shafting or locking mechanical parts.

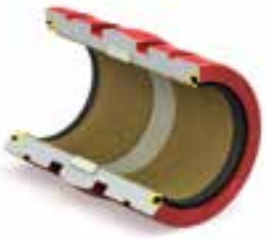
- When ordering a bearing with any internal features (seals or internal lubrication), the bearing may or may not be shipped with extra internal grooves in addition to those needed for the ordered option. Low volume orders are more likely to have additional grooves. The extra grooves will not negatively impact the performance of the bearing.
- Also, internal grooves are typically an anodized surface; however, in the interest of the quickest possible delivery, the internal grooves may not be anodized.

Lubrication System

Order with "JKM" modifier

Lubrication system includes:

- **Felt wick** – Retains oil lubricants (remove when using grease lubrication). Open are glued and closed are not.
- **Zerk fitting** – Installed into pillow block or other housing (Standard lube fitting with ¼-28 thread)



ZERK FITTING IN HOUSING

Bearing Alignment

- Linear ball bearings will continue to operate in a misaligned condition, but can cause damage to the shafting and catastrophically fail.
- Simplicity bearings DO NOT tolerate misalignment. They simply stop moving without any damage to the shafting. Self-aligning housings aid in misalignment – up to 1/2° from centerline.

Note: Please refer to the tables in the installation section for possible solutions to misalignment.

Misalignment Considerations–page 85-88

Simplicity® Plain Bearings Overview

Temperature

Simplicity bearings can operate in a wide range of temperatures (-400°F to +400°F) (-240°C to +204°C). Depending on the materials housed in the pillow block and the size of bearing

- Maintains the same performance characteristics
- The thin liner allows heat to dissipate through the bearing shell

Thermal Expansion

The standard bearing I.D. options are designed for use in most industrial applications.

- For temperatures below 0°F, the standard I.D. is recommended (FL series).
- For extreme high temperatures, the Compensated I.D. bearing is recommended (FLC) for the increased running clearance.

⚠ CAUTION *It is always best to inspect actual size at extreme temperatures to ensure proper running clearance.*

Rotary Applications

Simplicity bearings will operate very well in rotary applications if applied properly.

- Stationary rotary applications do not allow the heat to be spread over an extended area. It is retained in the I.D. of the bearing limiting speed and load.
- MAX rotary speed (No lube/continuous motion)
- 40 sfm (12.2 m/min.) for standard precision I.D. clearances
- 140 sfm (42.6 m/min.) for compensated I.D. clearances
- V(sfm) = .262 x d x RPM
  d = shaft diameter (inches)
  RPM = revolutions per MINute
- Properly maintained lubrication can increase these speeds dramatically

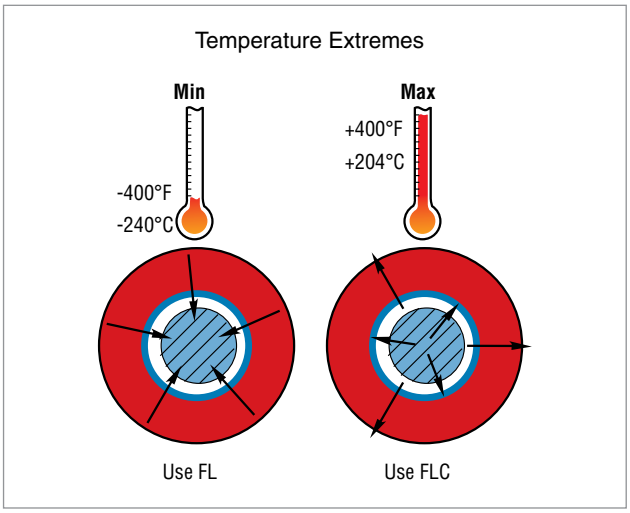
⚠ CAUTION *It is always best to do specific testing for rotary applications above these limits where lubrication is to be used.*

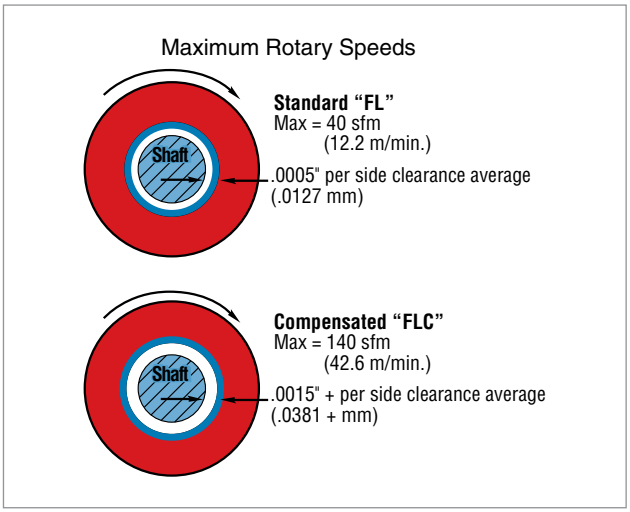
Submerged Applications

Simplicity bearings will provide excellent performance in a submerged condition.

- The bearings will employ the fluid as a lubricant showing increased velocities and wear life. Oils and non-salt water are especially effective.

Note: Please contact factory before specifying Frelon GOLD for submerged applications.





Vacuums/Outgassing/Cleanrooms

Due to self-lubrication, low outgassing, and a minimum of particulate (buildup), Simplicity bearings are excellent in clean rooms and vacuums.

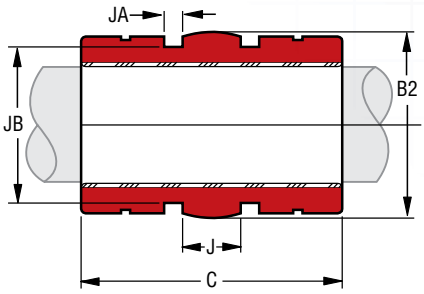
- Testing has been done on the Frelon® materials in accordance with ASTM E-595-90 with acceptable Maximums of 1.00% TML and .10% CVCM.

MATERIAL	%TML	%CVCM
Frelon GOLD®	0.00	0.00
Frelon J	0.18	0.01

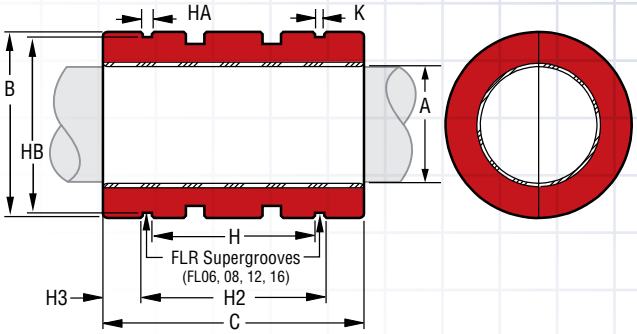
TML = Total Mass Loss
CVCM = Collected Volatile Condensable Materials

Simplicity® Linear Plain Bearings

*Self Aligning O.D. (FLA-XX)



Standard O.D. (FL-XX)



*Except for the O.D., bearings with the self-aligning feature have the same dimensions and tolerances as the standard bearing. There is a spherical crown on the O.D. to create the self-aligning feature. They are for use in a straight bore housing. Add an "A" to the part number for self-aligning bearings.

Dimensional Information

Precision I.D. Series Similar to Preloaded Ball Bearing				Compensated I.D. Series Allows Additional Running Clearance				Nominal Size	B Standard O.B.		B2 Self-Aligning Fla Crown O.B.		C Length		Con-Centric	Bearing Weight	K Flr Ret. Ring Grv.
Part No.		A Bearing I.D.		Part No.		A Bearing I.D.											
Closed	Open	MIN	MAX	Closed	Open	MIN	MAX	in.	MIN	MAX	MIN	MAX	MIN	MAX	MAX	lbs.	
FL03	N/A	0.1877	0.1884	FLC 03	N/A	0.1897	0.1904	3/16	0.3740	0.3750	0.3725	0.3735	0.5470	0.5620	0.0010	0.0030	N/A
FL04	FLN04	0.2502	0.2511	FLC 04	FLCN 04	0.2522	0.2531	1/4	0.4990	0.5000	0.4975	0.4985	0.7350	0.7500	0.0010	0.0090	N/A
FL06	FLN06	0.3752	0.3761	FLC 06	FLCN 06	0.3772	0.3781	3/8	0.6240	0.6250	0.6225	0.6235	0.8600	0.8750	0.0010	0.0160	0.0720
FL08	FLN08	0.5002	0.5013	FLC 08	FLCN 08	0.5022	0.5033	1/2	0.8740	0.8750	0.8725	0.8735	1.2350	1.2500	0.0010	0.0410	0.0800
FL10	FLN10	0.6252	0.6263	FLC 10	FLCN 10	0.6272	0.6283	5/8	1.1240	1.1250	1.1225	1.1235	1.4850	1.5000	0.0010	0.0910	N/A
FL12	FLN12	0.7503	0.7516	FLC 12	FLCN 12	0.7533	0.7546	3/4	1.2490	1.2500	1.2475	1.2485	1.6100	1.6250	0.0010	0.1090	0.1710
FL16	FLN16	1.0003	1.0016	FLC 16	FLCN 16	1.0033	1.0046	1	1.5613	1.5625	1.5599	1.5609	2.2350	2.2500	0.0010	0.2280	0.1330
FL20	FLN20	1.2504	1.2519	FLC 20	FLCN 20	1.2544	1.2559	1-1/4	1.9988	2.0000	1.9974	1.9984	2.6100	2.6250	0.0010	0.4590	N/A
FL24	FLN24	1.5004	1.5019	FLC 24	FLCN 24	1.5044	1.5059	1-1/2	2.3738	2.3750	2.3724	2.3734	2.9850	3.0000	0.0010	0.7250	N/A
FL32	FLN32	2.0004	2.0022	FLC 32	FLCN 32	2.0054	2.0072	2	2.9986	3.0000	2.9973	2.9983	3.9850	4.0000	0.0010	1.4420	N/A
FL40	FLN40	2.5004	2.5022	FLC 40	FLCN 40	2.5054	2.5072	2-1/2	3.7484	3.7500	3.7472	3.7482	4.9850	5.0000	0.0013	2.8160	N/A
FL48	FLN48	3.0004	3.0022	FLC 48	FLCN 48	3.0064	3.0082	3	4.4980	4.5000	4.4970	4.4980	5.9850	6.0000	0.0015	4.9140	N/A
FL64	FLN64	4.0005	4.0026	FLC 64	FLCN 64	4.0065	4.0086	4	5.9980	6.0000	5.9970	5.9980	7.9850	8.0000	0.0020	11.8360	N/A

Mounting Dimensions

Part No.		Nominal Size	H	HA	HB		J	JA	JB		H2	H3
Closed	Open	in.	Between Ret. Rings	Ret. Ring GRV. Width	Ret. Ring GRV. Dia.	Truarc Ret. Ring Part No.	Between O'Ring GRVS.	O'Ring GRV. Width	O'Ring Grv. Dia.	Parker O'Ring Part No.	FLR Between Rings	FLR Ring Edge
FL03	N/A	3/16	0.375	0.030	0.352	N 5100-37	N/A	N/A	N/A	N/A	N/A	N/A
FL04	FLN04	1/4	0.437	0.041	0.467	N 5100-50	0.125	0.080	0.399	2-010	N/A	N/A
FL06	FLN06	3/8	0.562	0.041	0.587	N 5100-62	0.187	0.080	0.524	2-012	.711/.701	0.081
FL08	FLN08	1/2	0.875	0.048	0.820	N 5100-87	0.250	0.125	0.712	2-113	1.042/1.032	0.103
FL10	FLN10	5/8	1.000	0.058	1.060	N 5100-112	0.312	0.125	0.962	2-117	N/A	N/A
FL12	FLN12	3/4	1.062	0.058	1.177	N 5100-125	0.312	0.125	1.087	2-119	1.281/1.271	0.171
FL16	FLN16	1	1.625	0.070	1.471	N 5100-156	0.500	0.125	1.399	2-123	1.895/1.885	0.176
FL20	FLN20	1-1/4	1.875	0.070	1.889	N 5100-200	0.625	0.125	1.837	2-129	N/A	N/A
FL24	FLN24	1-1/2	2.250	0.089	2.241	N 5100-237	0.750	0.162	2.152	2-225	N/A	N/A
FL32	FLN32	2	3.000	0.105	2.839	N 5100-300	1.000	0.189	2.775	2-229	N/A	N/A
FL40	FLN40	2-1/2	3.750	0.123	3.553	N 5100-375	1.250	0.250	3.408	2-340	N/A	N/A
FL48	FLN48	3	4.500	0.123	4.309	N 5100-450	1.500	0.287	4.158	2-346	N/A	N/A
FL64	FLN64	4	6.000	0.145	5.748	N 5100-600	2.000	0.287	5.660	2-356	N/A	N/A

Note: FLR is only available on FL06, FL08, FL12 and FL16.

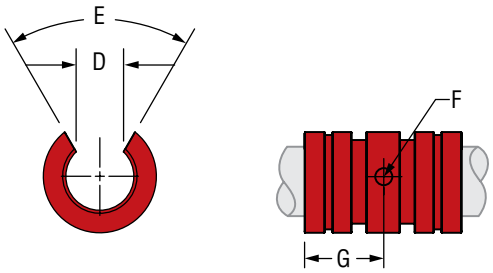
To see retired LEE product number converstions to current product numbers, see page 39

Simplicity® Linear Plain Bearings

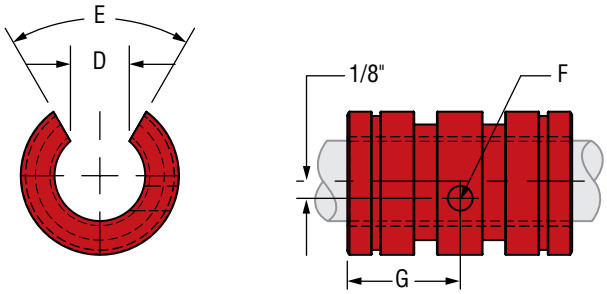
Linear Plain Bearings FL & FLN

Configure

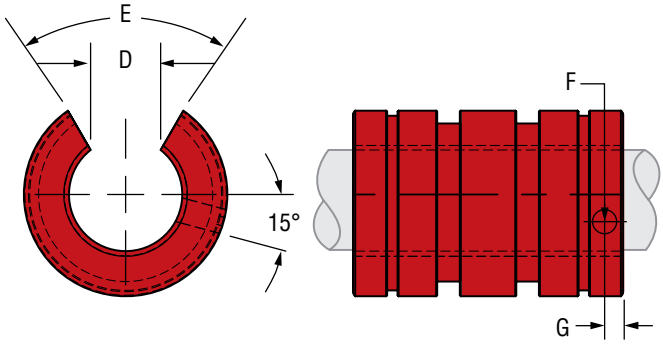
FLN 04 - FLN 06



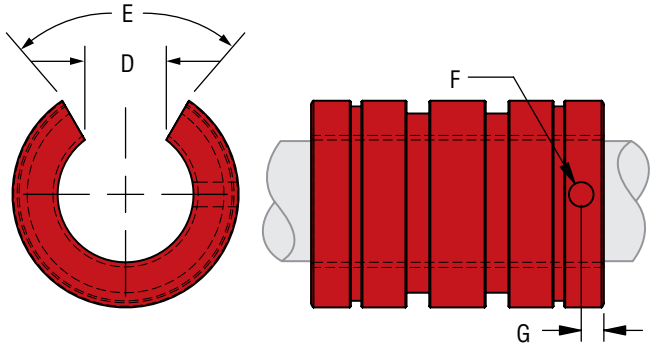
FLN 08



FLN 10



FLN 12 thru FLN 64



Open Dimensional Information

Part No.		Nominal Size	D Slot Wide MIN	E Slot Angle	F Retaining Hole Dia.	G Retaining Hole Locate	Bearing Weight
Precision	Compensated	in.				in.	lbs.
FLN04	FLCN04	1/4	0.188	60°	0.094	3/8	0.008
FLN06	FLCN06	3/8	0.250	60°	0.094	7/16	0.013
FLN08	FLCN08	1/2	0.313	60°	0.136	5/8	0.034
FLN10	FLCN10	5/8	0.375	60°	0.136	1/8	0.072
FLN12	FLCN12	3/4	0.438	60°	0.136	1/8	0.091
FLN16	FLCN16	1	0.563	60°	0.136	1/8	0.184
FLN20	FLCN20	1-1/4	0.625	60°	0.201	3/16	0.381
FLN24	FLCN24	1-1/2	0.750	60°	0.201	3/16	0.603
FLN32	FLCN32	2	1.000	60°	0.265	5/16	1.192
FLN40	FLCN40	2-1/2	1.250	60°	0.265	5/16	2.334
FLN48	FLCN48	3	1.500	60°	0.265	5/16	4.080
FLN64	FLCN64	4	2.000	60°	0.265	5/16	9.870

Note: All other dimensions same as closed bearing.
Frelon GOLD® and Frelon® J are registered trademarks of LEE Linear®.

Load & Speed Data

Part No.	Effective Surface Area	MAX Static Load lbs.	
		Frelon	
	Sq. in.	GOLD	J & W
FL03	0.110	220	100
FL04	0.200	600	300
FL06	0.340	1020	510
FL08	0.650	1950	975
FL10	0.980	2940	1470
FL12	1.270	3810	1905
FL16	2.350	7050	3525
FL20	3.430	10830	5415
FL24	4.700	14100	7050
FL32	8.350	25050	12525
FL40	13.000	39000	19500
FL48	18.800	56400	28200
FL64	33.500	100500	50250

Note: MAX PV (ft./min. * psi)
Frelon GOLD = 20000 PV Frelon J = 10000 PV

MAX Speed Running Dry (ft./min.)
Frelon GOLD = 300 sfm Frelon J = 140 sfm

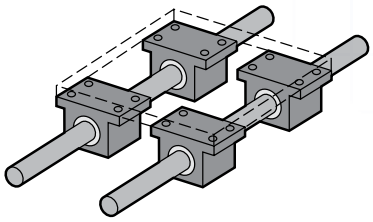
MAX Speed Running with Lubrication (ft./min.)
Frelon GOLD = 825 sfm Frelon J = 400 sfm

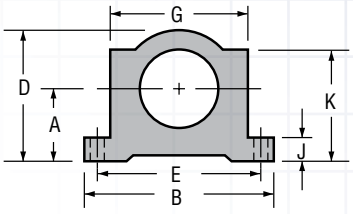
Only certified 60 Plus Shafting provides Maximum linear bearing performance.
Inch Series–page 3 Metric Series–page 40

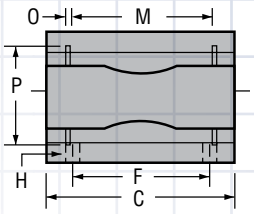
To see retired LEE product number converstions to current product numbers, see page 39

Simplicity® Pillow Blocks

Plain Bearings – Closed Pillow Blocks P





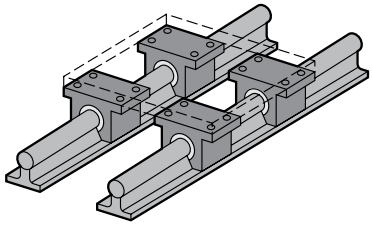


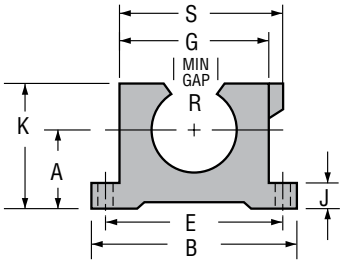
Part No.		Nom. Brg. I.D.	A	B	C	D	E	F	G	H		J	K	M	O	P	Retaining Ring Part No.	MAX Static Load lbs.		Assem. Wt.
Closed			Centerline						Body			Flange		GRV.	GRV.	GRV.		Frelon®		
Precision	Compensated	in.	+/- .001	Width	Length	Height	+/- .010	+/-.010	Width	Bolt	Hole	Thick	K	Space	Width	Dia.		GOLD	J & W	lbs.
P04	P04C	1/4	0.437	1.625	1.19	0.813	1.312	0.750	1.000	#6	5/32"	0.188	0.750	0.750	0.039	0.532	6010026	600	300	0.099
P06	P06C	3/8	0.500	1.750	1.31	0.938	1.437	0.875	1.125	#6	5/32"	0.188	0.875	0.875	0.039	0.665	6010027	1020	510	0.129
P08	P08C	1/2	0.687	2.000	1.69	1.250	1.688	1.000	1.375	#6	5/32"	0.250	1.125	1.250	0.046	0.931	6010028	1950	975	0.250
P10	P10C	5/8	0.875	2.500	1.94	1.625	2.125	1.125	1.750	#8	3/16"	0.281	1.438	1.500	0.056	1.197	6010029	2940	1470	0.500
P12	P12C	3/4	0.937	2.750	2.06	1.750	2.375	1.250	1.875	#8	3/16"	0.313	1.563	1.625	0.056	1.330	6010030	3710	1905	0.580
P16	P16C	1	1.187	3.250	2.81	2.188	2.875	1.750	2.375	#10	7/32"	0.375	1.938	2.250	0.068	1.671	6010031	7050	3525	1.000
P20	P20C	1-1/4	1.500	4.000	3.63	2.813	3.500	2.000	3.000	#10	7/32"	0.438	2.500	2.625	0.068	2.122	6010032	10290	5145	2.000
P24	P24C	1-1/2	1.750	4.750	4.00	3.250	4.125	2.500	3.500	1/4"	9/32"	0.500	2.875	3.000	0.086	2.519	6010033	14100	7050	3.000
P32	P32C	2	2.125	6.000	5.00	4.063	5.250	3.250	4.500	3/8"	13/32"	0.625	3.625	4.000	0.103	3.182	6010034	25050	12525	6.500

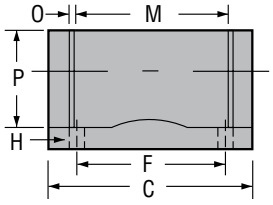
Notes: (1) Standard, pre-assembled pillow blocks include self-aligning housing and precision bearing.
(2) All standard pillow blocks use standard FL series bearings.
(3) Straight bore, pre-assembled pillow blocks use standard FL series bearings.

Configure

Plain Bearings – Open Pillow Blocks PN







Part No.		Nom. Brg. I.D.	A	B	C	E	F	G	H		J	K	M	O	P	R	Retaining Ring Part No.	MAX Static Load lbs.		Assem. Wt.	S
Closed			Centerline					Body			Flange		GRV.	GRV.	GRV.	MIN		Frelon			Overall
Precision	Compensated	in.	+/-.001	Width	Length	+/-.010	+/-.010	Width	Bolt	Hole	Thick	Height	Space	Width	Dia.	Open		GOLD	J & W	lbs.	Width
PN08	PN08C	1/2	0.687	2.000	1.50	1.688	1.000	1.375	#6	5/32"	0.250	1.125	1.250	0.046	0.931	0.313	6010035	1950	975	0.250	1.438
PN10	PN10C	5/8	0.875	2.500	1.75	2.125	1.125	1.750	#8	3/16"	0.281	1.438	1.500	0.056	1.197	0.375	6010036	2940	1470	0.500	1.750
PN12	PN12C	3/4	0.937	2.750	1.88	2.375	1.250	1.875	#8	3/16"	0.313	1.563	1.625	0.056	1.330	0.438	6010037	3710	1905	0.580	1.938
PN16	PN16C	1	1.187	3.250	2.63	2.875	1.750	2.375	#10	7/32"	0.375	1.938	2.250	0.068	1.671	0.563	6010038	7050	3525	1.000	2.438
PN20	PN20C	1-1/4	1.500	4.000	3.38	3.500	2.000	3.000	#10	7/32"	0.438	2.500	2.625	0.068	2.122	0.625	6010039	10290	5145	2.000	3.125
PN24	PN24C	1-1/2	1.750	4.750	3.75	4.125	2.500	3.500	1/4"	9/32"	0.500	2.875	3.000	0.086	2.519	0.750	6010040	14100	7050	3.000	3.625
PN32	PN32C	2	2.125	6.000	4.75	5.250	3.250	4.500	3/8"	13/32"	0.625	3.625	4.000	0.103	3.182	1.000	6010041	25050	12525	6.500	4.688

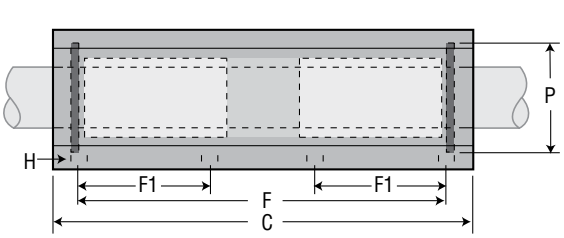
Notes: (1) Standard, pre-assembled pillow blocks include self-aligning housing and precision bearing.
(2) All standard pillow blocks use standard FL series bearings.

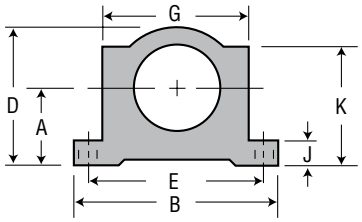
Only certified 60 Plus Shafting provides Maximum linear bearing performance.
Inch Series–page 3 Metric Series–page 40

To see retired LEE product number converstions to current product numbers, see page 39

Simplicity® Twin Pillow Blocks

Plain Bearings – Closed Twin Pillow Blocks PW



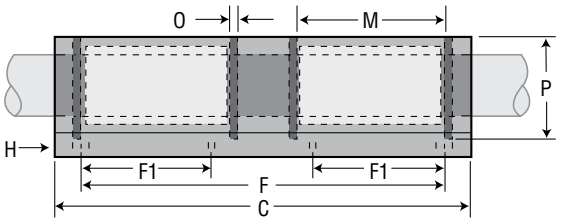


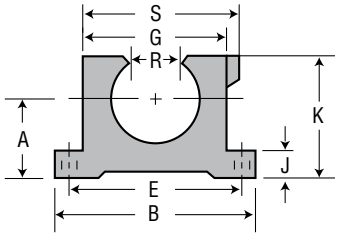
Part No. Closed		Nom. Brg. I.D.	A	B	C	D	E	F	F1	G	H		J	K	P	Retaining Ring Part No.	MAX Static Load lbs. Frelon®		Assem. Wt.
			Centerline							Body			Flange		GRV.		GOLD	J & W	
Precision	Compensated	In.	+/- .001	Width	Length	Height	+/- .010	+/-.010	+/-.010	Width	Bolt	Hole	Thick	K	Dia.				lbs.
PW04	PW 04C	1/4	0.437	1.625	2.500	0.813	1.3120	2.0000	.750	1.000	#6	5/32"	0.188	0.750	0.532	6010026	1200	600	0.197
PW06	PW 06C	3/8	0.500	1.750	2.750	0.938	1.4370	2.2500	.875	1.125	#6	5/32"	0.188	0.875	0.665	6010027	2040	1020	0.258
PW08	PW 08C	1/2	0.687	2.000	3.500	1.250	1.6880	2.5000	1.000	1.375	#6	5/32"	0.250	1.125	0.931	6010028	3900	1950	0.500
PW10	PW 10C	5/8	0.875	2.500	4.000	1.625	2.1250	3.0000	1.125	1.750	#8	3/16"	0.281	1.438	1.197	6010029	5880	2940	1.000
PW12	PW 12C	3/4	0.937	2.750	4.500	1.750	2.3750	3.5000	1.250	1.875	#8	3/16"	0.313	1.563	1.330	6010030	7620	3810	1.125
PW16	PW 16C	1	1.187	3.250	6.000	2.188	2.8750	4.5000	1.750	2.375	#10	7/32"	0.375	1.938	1.671	6010031	14100	7050	2.188
PW20	PW 20C	1-1/4	1.500	4.000	7.500	2.813	3.5000	5.5000	2.000	3.000	#10	7/32"	0.438	2.500	2.122	6010032	20580	10290	4.250
PW24	PW 24C	1-1/2	1.750	4.750	9.000	3.250	4.1250	6.5000	2.500	3.500	1/4"	9/32"	0.500	2.875	2.519	6010033	28200	14100	6.375
PW32	PW 32C	2	2.125	6.000	10.000	4.063	5.2500	8.2500	3.250	4.500	3/8"	13/32"	0.625	3.625	3.182	6010034	50100	25050	13.500

Notes: (1) Standard, pre-assembled pillow blocks include self-aligning housing and precision bearing.
(2) All standard pillow blocks use standard FL series bearings.
(3) Twin Closed Pillow Blocks use a spacer to separate the bearings.
(4) Twin pillow blocks, closed, with no seal option: Use two standard bearings, based on compensated or standard option.
(5) Twin pillow blocks, closed, with double seal option: Use two single seal bearings.

Configure

Plain Bearings – Open Twin Pillow Blocks PWN





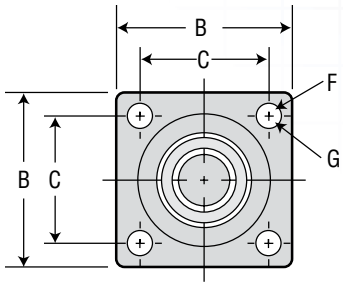
Part No. Closed		Nom. Brg. I.D.	A	B	C	E	F	F1	G	H		J	K	M	O	P	R	Retaining Ring Part No.	MAX Static Load lbs. Frelon		Assem. Wt.	S
			Centerline						Body			Flange		GRV.	GRV.	GRV.	MIN		GOLD	J & W		Overall
Precision	Compensated	In.	+/-.001	Width	Length	+/-.010	+/-.010	+/-.010	Width	Bolt	Hole	Thick	Height	Space	Width	Dia.	Open				lbs.	Width
PWN08	PWN 08C	1/2	0.687	2.000	3.500	1.688	2.500	1.000	1.375	#6	5/32"	0.250	1.125	1.250	0.046	0.931	0.313	6010035	3900	1950	0.400	1.438
PWN10	PWN 10C	5/8	0.875	2.500	4.000	2.125	3.000	1.125	1.750	#8	3/16"	0.281	1.438	1.500	0.056	1.197	0.375	6010036	5880	2940	0.910	1.813
PWN12	PWN 12C	3/4	0.937	2.750	4.500	2.375	3.500	1.250	1.875	#8	3/16"	0.313	1.563	1.625	0.056	1.330	0.438	6010037	7620	3810	1.060	1.938
PWN16	PWN 16C	1	1.187	3.250	6.000	2.875	4.500	1.750	2.375	#10	7/32"	0.375	1.938	2.250	0.068	1.671	0.563	6010038	14100	7050	1.970	2.438
PWN20	PWN 20C	1-1/4	1.500	4.000	7.500	3.500	5.500	2.000	3.000	#10	7/32"	0.438	2.500	2.625	0.068	2.122	0.625	6010039	20580	10290	3.725	3.125
PWN24	PWN 24C	1-1/2	1.750	4.750	9.000	4.125	6.500	2.500	3.500	1/4"	9/32"	0.500	2.875	3.000	0.086	2.519	0.750	6010040	28200	14100	5.800	3.625
PWN32	PWN 32C	2	2.125	6.000	10.000	5.250	8.250	3.250	4.500	3/8"	13/32"	0.625	3.625	4.000	0.103	3.182	1.000	6010041	50100	25050	12.125	4.688

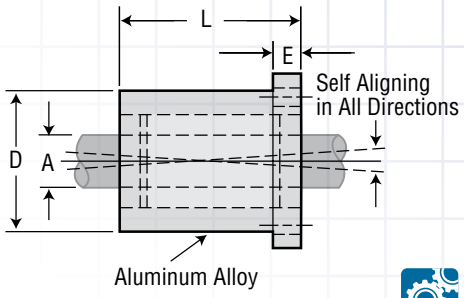
Notes: (1) Standard, pre-assembled pillow blocks include self-aligning housing and precision bearing.
(2) All standard pillow blocks use standard FL series bearings.
(3) Twin pillowblocks, open, with no seal option: Use two standard open bearings, based on compensated or standard option.
(4) Twin pillowblocks, open, with double seal option: Use two double seal bearings.

To see retired LEE product number converstions to current product numbers, see page 39

Simplicity® Flange Mounts

Flange Mounts SFP





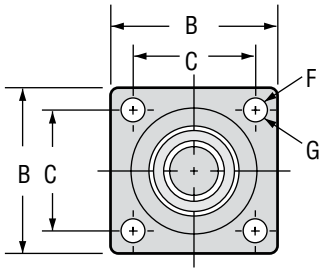
Configure

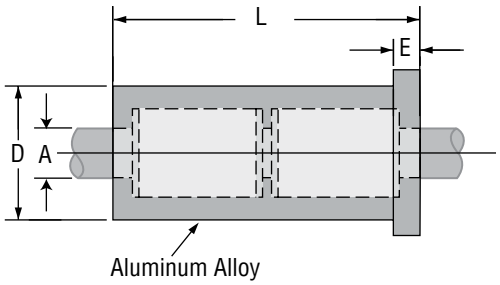
Dimensional Information

Part No.				A Nominal Bearing Size	B	C	D	E	F	G	L	MAX Static Load lbs.		Assembly Weight
												Frelon®		
Precision	Retired	Compensated	Retired		Flange Square	Hole Spacing	Barrel Dia.	Flange Length	Bolt Size	Hole Size	Length Overall	GOLD	J & W	lbs.
SFP06	–	SFP06 C	–	3/8"	1.25	1.00	0.875	0.188	#4	0.125	1.31	1020	510	0.070
SFP08	FL8	SFP08 C	FL8C	1/2"	1.63	1.25	1.25	0.250	#8	0.187	1.687	1950	975	0.175
SFP12	FL12	SFP12 C	FL12C	3/4"	2.38	1.75	1.75	0.375	#10	0.219	2.067	2940	1470	0.463
SFP16	FL16	SFP16 C	FL16C	1"	2.75	2.125	2.25	0.500	1/4"	0.281	2.812	3810	1905	1.206
SFP20	FL20	SFP20 C	FL20C	1 1/4"	3.88	3.00	2.62	0.625	3/8"	0.386	3.625	10830	5415	1.830

Notes: (1) All standard, pre-assembled SFP assemblies include a self-aligning housing and standard FL bearings - allowing the bearing to self-align.
(2) SFPB assemblies include a straight bore housing and standard FL bearings - allowing for a more rigid fit.

Flange Mounts DFP





Dimensional Information

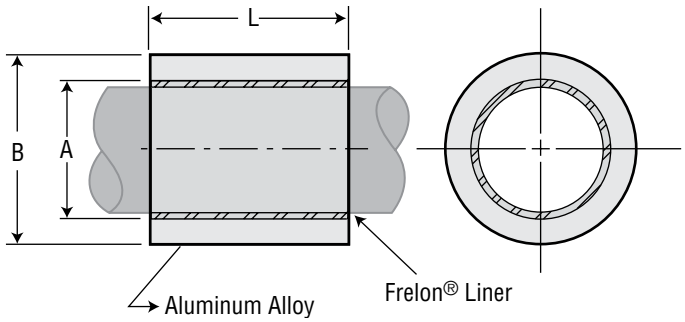
Part No.		A Nominal Bearing Size	B	C	D	E	F	G	L	MAX Static Load lbs.		Assembly Weight
										Frelon®		
Precision	Compensated		Flange Square	Hole Spacing	Barrel Dia.	Flange Length	Bolt Size	Hole Size	Length Overall	GOLD	J & W	lbs.
DFP08	DFP08 C	1/2"	1.63	1.25	1.25	0.250	#8	0.187	3.375	3900	1950	0.325
DFP12	DFP12 C	3/4"	2.38	1.75	1.75	0.375	#10	0.219	4.188	5880	2940	0.825
DFP16	DFP16 C	1"	2.75	2.125	2.25	0.500	1/4"	0.281	5.625	7620	3810	1.750

Notes: (1) All standard, pre-assembled DFP assemblies include a self-aligning housing and standard FL bearings - allowing the bearing to self-align.
(2) Straight bore DFPB assemblies include a straight bore housing and standard FL bearings - allowing for a more rigid fit.

Only certified 60 Plus Shafting provides Maximum linear bearing performance.
Inch Series–page 3 Metric Series–page 40

Simplicity® Sleeve Bearings

Sleeve Bearings PS



Configure

Dimensional Information

Part No.	Nominal Bearing Size I.D.	Nominal Bearing Size O.D.	Nominal Bearing Size Length	A Bearing I.D. MIN	A Bearing I.D. MAX	B O.D. MIN	B O.D. MAX	L Length MIN	L Length MA.	MAX Static Load lbs. Frelon® GOLD	MAX Static Load lbs. Frelon® J & W	Bearing Weight oz.	Recommended Housing Bore Slip Fit & Epoxy MIN	Recommended Housing Bore Slip Fit & Epoxy MAX	Recommended Housing Bore Press Fit MIN	Recommended Housing Bore Press Fit MAX
PS0305-02	3/16"	5/16"	1/4"	0.1890	0.1900	0.3135	0.3145	0.230	0.250	130	65	0.02	0.3145	0.3155	0.3125	0.3130
PS0305-04	3/16"	5/16"	1/2"	0.1890	0.1900	0.3135	0.3145	0.480	0.500	272	136	0.04	0.3145	0.3155	0.3125	0.3130
PS0406-02	1/4"	3/8"	1/4"	0.2515	0.2525	0.3760	0.3770	0.230	0.250	174	87	0.03	0.3770	0.3780	0.3750	0.3755
PS0406-03	1/4"	3/8"	3/8"	0.2515	0.2525	0.3760	0.3770	0.355	0.375	268	134	0.04	0.3770	0.3780	0.3750	0.3755
PS0406-04	1/4"	3/8"	1/2"	0.2515	0.2525	0.3760	0.3770	0.480	0.500	362	181	0.05	0.3770	0.3780	0.3750	0.3755
PS0610-04	3/8"	5/8"	1/2"	0.3765	0.3775	0.6260	0.6270	0.480	0.500	542	271	0.14	0.6270	0.6280	0.6250	0.6255
PS0610-06	3/8"	5/8"	3/4"	0.3765	0.3775	0.6260	0.6270	0.730	0.750	824	412	0.20	0.6270	0.6280	0.6250	0.6255
PS0710-06	7/16"	5/8"	3/4"	0.4390	0.4400	0.6260	0.6270	0.730	0.750	962	481	0.23	0.6270	0.6280	0.6250	0.6255
PS0812-04	1/2"	3/4"	1/2"	0.5015	0.5025	0.7510	0.7520	0.480	0.500	722	361	0.15	0.7520	0.7530	0.7500	0.7505
PS0812-06	1/2"	3/4"	3/4"	0.5015	0.5025	0.7510	0.7520	0.730	0.750	1098	549	0.25	0.7520	0.7530	0.7500	0.7505
PS0812-08	1/2"	3/4"	1"	0.5015	0.5025	0.7510	0.7520	0.980	1.000	1474	737	0.35	0.7520	0.7530	0.7500	0.7505
PS1014-06	5/8"	7/8"	3/4"	0.6265	0.6275	0.8760	0.8770	0.730	0.750	1372	686	0.30	0.8770	0.8780	0.8750	0.8755
PS1014-08	5/8"	7/8"	1"	0.6265	0.6275	0.8760	0.8770	0.980	1.000	1842	921	0.45	0.8770	0.8780	0.8750	0.8755
PS1216-08	3/4"	1"	1"	0.7515	0.7525	1.0010	1.0020	0.980	1.000	2210	1105	0.50	1.0020	1.0030	0.9995	1.0000
PS1216-10	3/4"	1"	1.25"	0.7515	0.7525	1.0010	1.0020	1.230	1.250	2777	1389	0.65	1.0020	1.0030	0.9995	1.0000
PS1620-12	1"	1-1/4"	1-1/2"	1.0015	1.0025	1.2510	1.2520	1.480	1.500	4446	2223	0.95	1.2520	1.2530	1.2490	1.2500
PS2024-16	1-1/4"	1-1/2"	2"	1.2515	1.2525	1.5010	1.5020	1.980	2.000	7434	3717	1.55	1.5020	1.5030	1.4990	1.5000
PS2428-16	1-1/2"	1-3/4"	2"	1.5015	1.5025	1.7510	1.7520	1.980	2.000	8918	4459	1.80	1.7520	1.7530	1.7490	1.7500
PS2832-24	1-3/4"	2"	3"	1.7515	1.7525	2.0010	2.0020	2.980	3.000	15658	7829	3.15	2.0020	2.0030	1.9990	2.0000
PS3236-24	2"	2-1/4"	3"	2.0015	2.0025	2.2510	2.2520	2.980	3.000	17894	8947	3.55	2.2520	2.2530	2.2490	2.2500
PS4044-24	2-1/2"	2-3/4"	3"	2.5015	2.5025	2.7510	2.7520	2.980	3.000	22364	11182	4.85	2.7520	2.7530	2.7490	2.7500
PS4852-28	3"	3-1/4"	3-1/2"	3.0015	3.0025	3.2510	3.2520	3.480	3.500	31336	15668	6.10	3.2520	3.2530	3.2485	3.2495

Ordering Information

PS	12	16	-	08
Type	**I.D.**	**O.D.**		**Length**
PS: Precision Sleeve Bearing	I.D. in 1/16" Increments	O.D. in 1/16" Increments		Length in 1/8" Increments

Note: Lengths not listed above must be specially quoted.

Only certified 60 Plus Shafting provides Maximum linear bearing performance.
Inch Series–page 3 Metric Series–page 40

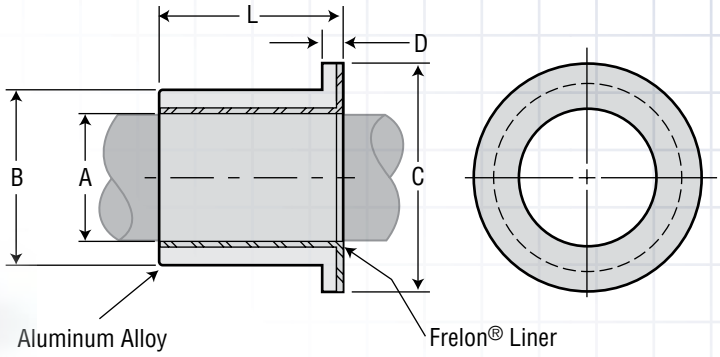
- **INSTALLATION INSTRUCTIONS**
- 1. Slip the bearing sleeve into the housing and epoxy into place with Loctite® or similar type bonding agent.

CAUTION *Do NOT let any of the adhesive touch the bearing liner. It will harden and interfere with the running clearance.*

- 2. Freeze the bearings at 0°F (-17.75°C) for 30-45 minutes. Using gloves, remove the bearings from the freezer and slip them into the housing. As they heat to room temperature, full contact between the bearing and housing will be achieved. The greatest advantage to this technique over traditional pressing is greater accuracy in alignment.

Simplicity® Sleeve Bearings with Flange

Sleeve Bearings with Flange PSF



Configure

Dimensional Information

Part No.	Nominal Bearing Size I.D.	Nominal Bearing Size O.D.	Nominal Bearing Size Length	A Bearing I.D. MIN	A Bearing I.D. MAX	B O.D. MIN	B O.D. MAX	C Flange O.D.	D Flange Width	L Length MIN	L Length MAX	MAX Static Load lbs. Frelon® GOLD	MAX Static Load lbs. Frelon® J & W	Bearing Weight oz.	Recommended Housing Bore Slip Fit & Epoxy MIN	Recommended Housing Bore Slip Fit & Epoxy MAX	Recommended Housing Bore Press Fit MIN	Recommended Housing Bore Press Fit MAX
PSF0305-02	3/16"	5/16"	1/4"	0.1890	0.1900	0.3135	0.3145	0.4370	0.0625	0.230	0.250	130	65	0.023	0.3145	0.3155	0.3125	0.3130
PSF0305-04	3/16"	5/16"	1/2"	0.1890	0.1900	0.3135	0.3145	0.4370	0.0625	0.480	0.500	272	136	0.044	0.3145	0.3155	0.3125	0.3130
PSF0406-02	1/4"	3/8"	1/4"	0.2515	0.2525	0.3760	0.3770	0.5000	0.0625	0.230	0.250	174	87	0.031	0.3770	0.3780	0.3750	0.3755
PSF0406-03	1/4"	3/8"	3/8"	0.2515	0.2525	0.3760	0.3770	0.5000	0.0625	0.355	0.375	268	134	0.044	0.3770	0.3780	0.3750	0.3755
PSF0406-04	1/4"	3/8"	1/2"	0.2515	0.2525	0.3760	0.3770	0.5000	0.0625	0.480	0.500	362	181	0.055	0.3770	0.3780	0.3750	0.3755
PSF0610-04	3/8"	5/8"	1/2"	0.3765	0.3775	0.6260	0.6270	0.8750	0.1250	0.480	0.500	542	271	0.20	0.6270	0.6280	0.6250	0.6255
PSF0610-06	3/8"	5/8"	3/4"	0.3765	0.3775	0.6260	0.6270	0.8750	0.1250	0.730	0.750	824	412	0.25	0.6270	0.6280	0.6250	0.6255
PSF0710-06	7/16"	5/8"	3/4"	0.4390	0.4400	0.6260	0.6270	0.9375	0.1250	0.730	0.750	962	481	0.20	0.6270	0.6280	0.6250	0.6255
PSF0812-04	1/2"	3/4"	1/2"	0.5015	0.5025	0.7510	0.7520	1.0000	0.1250	0.480	0.500	722	361	0.25	0.7520	0.7530	0.7500	0.7505
PSF0812-06	1/2"	3/4"	3/4"	0.5015	0.5025	0.7510	0.7520	1.0000	0.1250	0.730	0.750	1098	549	0.30	0.7520	0.7530	0.7500	0.7505
PSF0812-08	1/2"	3/4"	1"	0.5015	0.5025	0.7510	0.7520	1.0000	0.1250	0.980	1.000	1474	737	0.40	0.7520	0.7530	0.7500	0.7505
PSF1014-06	5/8"	7/8"	3/4"	0.6265	0.6275	0.8760	0.8770	1.0000	0.1250	0.730	0.750	1372	686	0.35	0.8770	0.8780	0.8750	0.8755
PSF1014-08	5/8"	7/8"	1"	0.6265	0.6275	0.8760	0.8770	1.0000	0.1250	0.980	1.000	1842	921	0.45	0.8770	0.8780	0.8750	0.8755
PSF1216-08	3/4"	1"	1"	0.7515	0.7525	1.0010	1.0020	1.2500	0.1250	0.980	1.000	2210	1105	0.55	1.0020	1.0030	0.9995	1.0000
PSF1620-12	1"	1-1/4"	1-1/2"	1.0015	1.0025	1.2510	1.2520	1.5000	0.1250	1.480	1.500	4446	2223	1.05	1.2520	1.2530	1.2490	1.2500
PSF2024-16	1-1/4"	1-1/2"	2"	1.2515	1.2525	1.5010	1.5020	1.7500	0.1250	1.980	2.000	7434	3717	1.80	1.5020	1.5030	1.4990	1.5000
PSF2428-16	1-1/2"	1-3/4"	2"	1.5015	1.5025	1.7510	1.7520	2.0000	0.1250	1.980	2.000	8918	4459	2.16	1.7520	1.7530	1.7490	1.7500
PSF2832-24	1-3/4"	2"	3"	1.7515	1.7525	2.0010	2.0020	2.2500	0.1250	2.980	3.000	15658	7829	3.30	2.0020	2.0030	1.9990	2.0000
PSF3236-24	2"	2-1/4"	3"	2.0015	2.0025	2.2510	2.2520	2.5000	0.1250	2.980	3.000	17894	8947	3.75	2.2520	2.2530	2.2490	2.2500
PSF4044-24	2-1/2"	2-3/4"	3"	2.5015	2.5025	2.7510	2.7520	3.0000	0.1250	2.980	3.000	22364	11182	4.60	2.7520	2.7530	2.7490	2.7500
PSF4852-28	3"	3-1/4"	3-1/2"	3.0015	3.0025	3.2510	3.2520	3.5000	0.1250	3.480	3.500	31336	15668	6.30	3.2520	3.2530	3.2485	3.2495

Ordering Information

PSF	12	16	-	08
Type	**I.D.**	**O.D.**		**Length**
PSF: Precision Sleeve Bearing with Flange	I.D. in 1/16" Increments	O.D. in 1/16" Increments		Length in 1/8" Increments

Note: Lengths not listed above must be specially quoted.

Only certified 60 Plus Shafting provides Maximum linear bearing performance.
Inch Series–page 3 Metric Series–page 40

- **INSTALLATION INSTRUCTIONS**
- 1. Slip the bearing sleeve into the housing and epoxy into place with Loctite® or similar type bonding agent.

CAUTION *Do NOT let any of the adhesive touch the bearing liner. It will harden and interfere with the running clearance.*

- 2. Freeze the bearings at 0°F (-17.75°C) for 30-45 minutes. Using gloves, remove the bearings from the freezer and slip them into the housing. As they heat to room temperature, full contact between the bearing and housing will be achieved. The greatest advantage to this technique over traditional pressing is greater accuracy in alignment.

Simplicity® Linear Plain Bearings

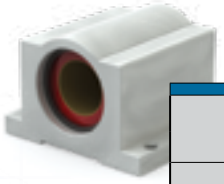
Retired Product No. Conversion Charts

Plain Bearings - Open Twin Pillow Blocks–page 32

Precision I.D. Series Similar To Preloaded Ball Bearing				Compensated I.D. Series Allows Additional Running Clearance				Nominal Size
Part No.				Part No.				
Closed	Retired Closed	Open	Retired Open	Closed	Retired Closed	Open	Retired Open	in.
FL03	NEW	N/A	N/A	FLC03	N/A	N/A	N/A	3/16
FL04	L408-6	FLN04	LX408-6	FLC04	L408-6C	FLCN 04	LX408-6C	1/4
FL06	L610-7	FLN06	LX610-7	FLC06	L610-7C	FLCN 06	LX610-7C	3/8
FL08	L814-10	FLN08	LX814-10	FLC08	L814-10C	FLCN 08	LX814-10C	1/2
FL10	L1018-12	FLN10	LX1018-12	FLC10	L1018-12C	FLCN 10	LX1018-12C	5/8
FL12	L1220-13	FLN12	LX1220-13	FLC12	L1220-13C	FLCN 12	LX1220-13C	3/4
FL16	L1625-18	FLN16	LX1625-18	FLC16	L1625-18C	FLCN 16	LX1625-18C	1
FL20	L2032-21	FLN20	LX2032-21	FLC20	L2032-21C	FLCN 20	LX2032-21C	1-1/4
FL24	L2438-24	FLN24	LX2438-24	FLC24	L2438-24C	FLCN 24	LX2438-24C	1-1/2
FL32	L3248-32	FLN32	LX3248-32	FLC32	L3248-32C	FLCN 32	LX3248-32C	2
FL40	L4060-40	FLN40	LX4060-40	FLC40	L4060-40C	FLCN 40	LX4060-40C	2-1/2
FL48	L4872-48	FLN48	LX4872-48	FLC48	L4872-48C	FLCN 48	LX4872-48C	3
FL64	L6496-64	FLN64	LX6496-64	FLC64	L6496-64C	FLCN 64	LX6496-64C	4

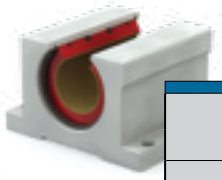
Plain Bearings - Open Twin Pillow Blocks–page 33

Part No.				Nominal Size
Precision	Retired Precision	Compensated	Retired Compensated	in.
FLN04	LX408-6	FLCN 04	LX408-6C	1/4
FLN06	LX610-7	FLCN 06	LX610-7C	3/8
FLN08	LX814-10	FLCN 08	LX814-10C	1/2
FLN10	LX1018-12	FLCN 10	LX1018-12C	5/8
FLN12	LX1220-13	FLCN 12	LX1220-13C	3/4
FLN16	LX1625-18	FLCN 16	LX1625-18C	1
FLN20	LX2032-21	FLCN 20	LX2032-21C	1-1/4
FLN24	LX2438-24	FLCN 24	LX2438-24C	1-1/2
FLN32	LX3248-32	FLCN 32	LX3248-32C	2
FLN40	LX4060-40	FLCN 40	LX4060-40C	2-1/2
FLN48	LX4872-48	FLCN 48	LX4872-48C	3
FLN64	LX6496-64	FLCN 64	LX6496-64C	4



Plain Bearings - Closed Pillow Blocks–page 34

Part No. Closed				Nom. Brg. I.D.
Precision	Retired Precision	Compensated	Retired Compensated	in.
P04	LPB4	P04C	LPB4C	1/4
P06	LPB6	P06C	LPB6C	3/8
P08	LPB8	P08C	LPB8C	1/2
P10	LPB10	P10C	LPB10C	5/8
P12	LPB12	P12C	LPB12C	3/4
P16	LPB16	P16C	LPB16C	1
P20	LPB20	P20C	LPB20C	1-1/4
P24	LPB24	P24C	LPB24C	1-1/2
P32	LPB32	P32C	LPB32C	2

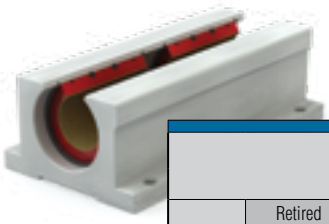


Plain Bearings - Open Pillow Blocks–page 34

Part No. Open				Nom. Brg. I.D.
Precision	Retired Precision	Compensated	Retired Compensated	in.
PN08	LXPB8	PN08C	LXPB8C	1/2
PN10	LXPB10	PN10C	LXPB10C	5/8
PN12	LXPB12	PN12C	LXPB12C	3/4
PN16	LXPB16	PN16C	LXPB16C	1
PN20	LXPB20	PN20C	LXPB20C	1-1/4
PN24	LXPB24	PN24C	LXPB24C	1-1/2
PN32	LXPB32	PN32C	LXPB32C	2

Plain Bearings - Closed Twin Pillow Blocks–page 35

Part No. Closed				Nom. Brg. I.D.
Precision	Retired Precision	Compensated	Retired Compensated	in.
PW04	LPB4T	PW04C	LPB4TC	1/4
PW06	LPB6T	PW06C	LPB6TC	3/8
PW08	LPB8T	PW08C	LPB8TC	1/2
PW10	LPB10T	PW10C	LPB10TC	5/8
PW12	LPB12T	PW12C	LPB12TC	3/4
PW16	LPB16T	PW16C	LPB16TC	1
PW20	LPB20T	PW20C	LPB20TC	1-1/4
PW24	LPB24T	PW24C	LPB24TC	1-1/2
PW32	LPB32T	PW32C	LPB32TC	2



Plain Bearings - Open Twin Pillow Blocks–page 35

Part No. Open				Nom. Brg. I.D.
Precision	Retired Precision	Compensated	Retired Compensated	in.
PWN08	LXPB8T	PWN08C	LXPB8TC	1/2
PWN10	LXPB10T	PWN10C	LXPB10TC	5/8
PWN12	LXPB12T	PWN12C	LXPB12TC	3/4
PWN16	LXPB16T	PWN16C	LXPB16TC	1
PWN20	LXPB20T	PWN20C	LXPB20TC	1-1/4
PWN24	LXPB24T	PWN24C	LXPB24TC	1-1/2
PWN32	LXPB32T	PWN32C	LXPB32TC	2

M ISO Metric Series

Metric Contents

Metric Round Shafting Steel & Stainless Steel

60 Plus® Shafting

LEE Linear®, formulated a linear shaft designed specifically for optimal bearing performance – 60 Plus Shafting. Advanced process capabilities maintain the ideal surface finish for linear bearings resulting in the longest life and highest performing shaft-to-bearing combination available.

- Optimized surface finish
- Faster break-in and better Frelon® transfer for plain bearings
- Longest life possible, less down time, and maintenance
- Straight to within .001" to .002" per foot cumulative, except on 3/8" diameter and smaller

See Pages 11–12 for machining options.

60 PLUS SHAFTING

Metric Shaft Part • Numbering Chart

Class	Diameter	Material	Length	Type
NIM	06	SS	0010	CM

Class

Code	Description
NIM	Metric Shaft
NIPDM	Metric Predrill
CCM	Feather Metric
CCMDL	Feather Metric Predrill
SRM	Metric Support Rail
SRAM	Metric Support Rail Assembly
LSRM	Metric Low Support Rail
LSGM	Metric Low Support Rail Assembly

NEW - see page 43

Diameter

Code	Description
04	4 mm
05	5 mm
06	6 mm
08	8 mm
10	10 mm
12	12 mm
16	16 mm
20	20 mm
25	25 mm
30	30 mm
40	40 mm
50	50 mm
60	60 mm
80	80 mm

Special

CM - Custom Machine
SL - Specified Length

Shaft Length

Millimeter - 0000

Material

Blank - 1060 CS
SS - 440 SS
SS303 - 303 SS*
CP - Chrome plate**
AR - Armoloy**

* 300 Series available in most diameters

**Available as special quotes

Sample Part Numbers

Carbon steel 20 mm diameter and 300 mm long
NIM20SS-0300

Feather metric 12 mm diameter and 150 mm long
CCM12-0150

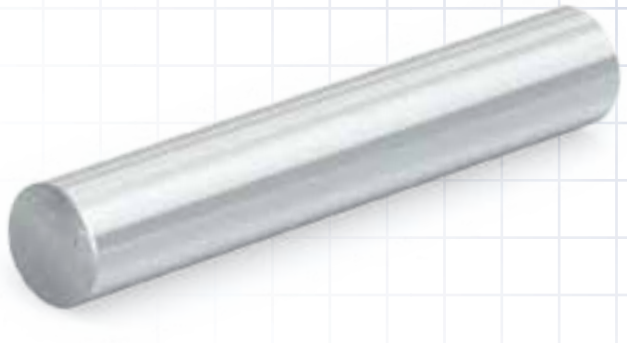
Round Shafting RC60 Steel & Stainless Steel

60 PLUS SHAFTING

RC60 Steel Solid Shafting NIM

Part No.	Nominal Dia.	Dia. Tolerance mm		MAX Length	MIN Hardness Depth	Weight
	mm	MIN	MAX	mm	mm	kg/m
NIM04-xxxx	4	3.987	4	6400	thru	0.10
NIM05-xxxx	5	4.987	5	6400	thru	0.15
NIM06-xxxx	6	5.987	6	6400	1.02	0.23
NIM08-xxxx	8	7.987	8	6400	1.02	0.39
NIM10-xxxx	10	9.987	10	6400	1.02	0.62
NIM12-xxxx	12	11.987	12	3900	1.52	0.89
NIM16-xxxx	16	15.987	16	3900	1.52	1.57
NIM20-xxxx	20	19.987	20	3900	1.52	2.45
NIM25-xxxx	25	24.987	25	4300	2.03	3.80
NIM30-xxxx	30	29.987	30	3900	2.03	5.50
NIM40-xxxx	40	39.984	40	3900	2.03	9.80
NIM50-xxxx	50	49.984	50	3900	2.54	15.30
NIM60-xxxx	60	59.981	60	3900	3.70	22.20
NIM80-xxxx	80	79.981	80	3550	3.70	39.50

Notes: (1) Specify length in part number using millimeters.
Example: for 25 mm shafting total length 900 mm = NIM25-0900.
(2) Surface finish bearing recommended 8 Ra.



- RC 60 Plus case hardened steel shafting
- Optimized for Simplicity® bearings and linear ball bearings
- Available cut-to-length or full lengths
- Length tolerance:
  4 mm–30 mm shaft = .8 mm
  40 mm–50 mm shaft = 1.6 mm
  60 mm–80 mm shaft = 3.2 mm
- Joinable for longer lengths
- Available as solid shafting or pre-drilled
(See pre-drilled NIPDM on next page)

440 Stainless Steel Solid Shafting NIM_SS

Part No.	Nominal Size	Dia. Tolerance mm		MAX Length	MIN Hardness Depth	Weight
	mm	MIN	MAX	mm	mm	kg/m
NIM04SS-xxxx	4	3.992	4	6400	thru	0.10
NIM05SS-xxxx*	5	4.992	5	6400	thru	0.15
NIM06SS-xxxx	6	5.991	6	6400	1.02	0.23
NIM08SS-xxxx	8	7.991	8	6400	1.02	0.39
NIM10SS-xxxx	10	9.991	10	6400	1.02	0.62
NIM12SS-xxxx	12	11.989	12	3900	1.52	0.89
NIM16SS-xxxx	16	15.989	16	3900	1.52	1.57
NIM20SS-xxxx	20	19.987	20	3900	1.52	2.45
NIM25SS-xxxx	25	24.987	25	4300	2.03	3.80
NIM30SS-xxxx	30	29.987	30	3900	2.03	5.50
NIM40SS-xxxx	40	39.987	40	3900	2.03	22.20
NIM50SS-xxxx	50	49.985	50	3900	2.54	39.50

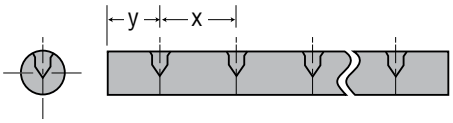
*Limited availability on NIM05SS, please contact factory.

- 440 stainless steel RC 50 Plus™ hardness
- Optimized for Simplicity bearings and linear ball bearings
- Available cut-to-length or full lengths
- Length tolerance:
  4 mm–30 mm shaft = .8 mm
  40 mm–50 mm shaft = 1.6 mm
  60 mm–80 mm shaft = 3.2 mm
- Available as solid shafting or pre-drilled
(See NIPDMxxSS on next page)

Shafting Stainless Steel & Ceramic Coated

Pre-Drilled & Tapped

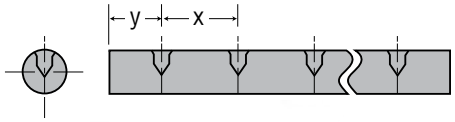
Steel NIPDM • 440 Stainless Steel NIPDM_SS



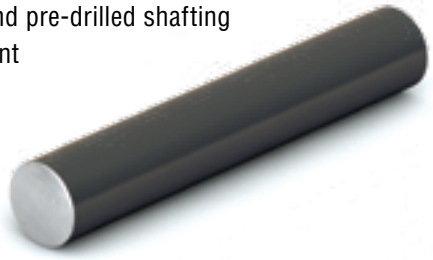
Part No.		Nominal Dia.	Dia. Tolerance mm		Standard Hole Spacing		Thread	MAX Length	Weight
Steel	Stainless Steel	mm	MIN	MAX	X	Y		mm	kg/m
NIPDM12-xxxx	NIPDM12SS-xxxx	12	11.9888	12	120	60	M4 x .7	3900	0.89
NIPDM16-xxxx	NIPDM16SS-xxxx	16	15.9893	16	150	75	M5 x .8	3900	1.57
NIPDM20-xxxx	NIPDM20SS-xxxx	20	19.9873	20	150	75	M6 x 1.0	3900	2.45
NIPDM25-xxxx	NIPDM25SS-xxxx	25	24.9885	25	200	100	M8 x 1.25	4300	3.80
NIPDM30-xxxx	NIPDM30SS-xxxx	30	29.9872	30	200	100	M10 x 1.5	3900	5.50
NIPDM40-xxxx	NIPDM40SS-xxxx	40	39.9872	40	200	100	M10 x 1.5	3900	9.80
NIPDM50-xxxx	NIPDM50SS-xxxx	50	49.9846	50	200	100	M12 x 1.75	3900	15.30

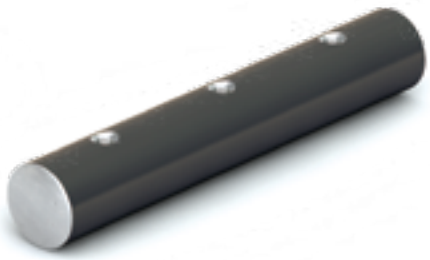
Notes: (1) Specify length in part number using mm.
Example: for 12 mm shafting total length 97 mm = NIPDM12-0097.
(2) Customer specifies 'y' dimension, if different than standard. Hole-to-hole tolerance = +/-.015".
(3) Consult factory for chrome plated, 303, or 316 stainless steel shafting.

Ceramic Coated



- Aluminum alloy base material
- RC 70 ceramic coated finish
- Designed to run with Simplicity® Frelon GOLD® lined bearings
- Interchanges with solid standard and pre-drilled shafting
- Non-magnetic and vibration resistant
- Weld splatter, paints, and contaminants will not stick
- NOT compatible with linear ball bearings





Solid Shafting CCM

Part No.	Nominal Dia.	Dia. Tolerance mm		MAX Length	Weight
	mm	MIN	MAX	mm	kg/m
CCM06-xxxx	6	5.992	6	3500	0.04
CCM08-xxxx	8	7.991	8	3500	0.07
CCM10-xxxx	10	9.991	10	3500	0.10
CCM12-xxxx	12	11.989	12	3500	0.15
CCM16-xxxx	16	15.989	16	3500	0.26
CCM20-xxxx	20	19.987	20	3500	0.41
CCM25-xxxx	25	24.987	25	3500	0.63
CCM30-xxxx	30	29.987	30	3500	0.92
CCM40-xxxx	40	39.984	40	3500	1.63
CCM50-xxxx	50	49.984	50	3500	2.55

Notes: (1) Specify length in part number using mm.
Example: for 8 mm shafting total length 97 mm = CCM08-0097.
(2) Ends of cut-to-length shafting are not coated.
(3) Fully coated shafting is available on special request.

Pre-Drilled & Tapped CCMDL

Part No.	Nominal Dia.	Dia. Tolerance mm		Standard Hole Spacing		Thread	MAX Length	Weight
	mm	MIN	MAX	X	Y		mm	kg/m
CCMDL08-xxxx	8	7.991	8	101.6	50.8	M2 x .4	3500	0.07
CCMDL10-xxxx	10	9.991	10	101.6	50.8	M3 x .5	3500	0.10
CCMDL12-xxxx	12	11.989	12	120	60	M4 x .7	3500	0.15
CCMDL16-xxxx	16	15.989	16	150	75	M5 x .8	3500	0.26
CCMDL20-xxxx	20	19.987	20	150	75	M6 x 1.0	3500	0.41
CCMDL25-xxxx	25	24.987	25	200	100	M8 x 1.25	3500	0.63
CCMDL30-xxxx	30	29.987	30	200	100	M10 x 1.5	3500	0.92

Notes: (1) Specify length in part number using mm.
Example: for 10 mm shafting total length 97 mm = CCMDL08-0097.
(2) Ends of cut-to-length shafting are not coated.
(3) Fully coated shafting is available on special request.
(4) Customer specifies 'y' dimension, if different than standard.

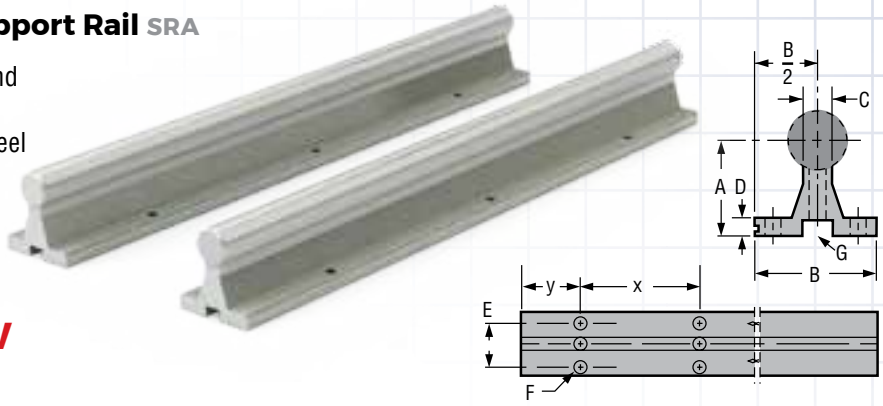
Configure

Shafting Rail Assemblies

Rail Assembly – Aluminum Support Rail SRA

- Two piece assembly RC60 steel shaft and aluminum support rail standard
- Other shaft materials – 440 stainless steel and ceramic coated aluminum
- Standard length tolerances are provided on page 51

NEW



Shafting Type			Nominal Dia.	Diameter Tolerance		A	B	C	D	E	F	Standard Hole Spacing		Weight
Steel rail Part No.	Ceramic coated shafting Part No.	440 stainless steel Part No.	MM	MIN	MAX	+/-.05					Hole Size	x	y	Kg/M
SRAM12	SRAM12CC	SRAM12SS	12	11.9888	12	28.00	38.10	6.60	4.76	25	M4	120	60	1.80
SRAM16	SRAM16CC	SRAM16SS	16	15.9893	16	28.50	41.28	7.94	6.35	28	M5	150	75	2.59
SRAM20	SRAM20CC	SRAM20SS	20	19.9873	20	38.00	44.45	9.53	6.35	32	M6	150	75	3.61
SRAM25	SRAM25CC	SRAM25SS	25	24.9885	25	42.00	53.98	12.70	6.35	38	M8	200	100	5.86
SRAM30	SRAM30CC	SRAM30SS	30	29.9872	30	53.00	63.50	14.29	7.94	46	M10	200	100	8.80
SRAM40	N/A	SRAM40SS	40	39.9872	40	64.00	76.20	17.46	9.53	58	M10	200	100	12.70
SRAM50	N/A	SRAM50SS	50	49.9846	50	82.00	95.25	22.23	12.70	70	M12	200	100	21.98

Note: Specify length in part number using inches. Example: for 1/2" shafting total length 36" long = SRA08-036.000.
Customer specifies 'y' dimension, if different than standard.

Support Rail – Aluminum SR & SR_PD

Non-Drilled (SR)

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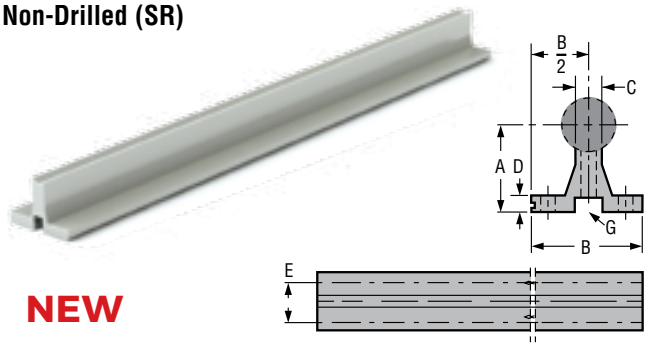
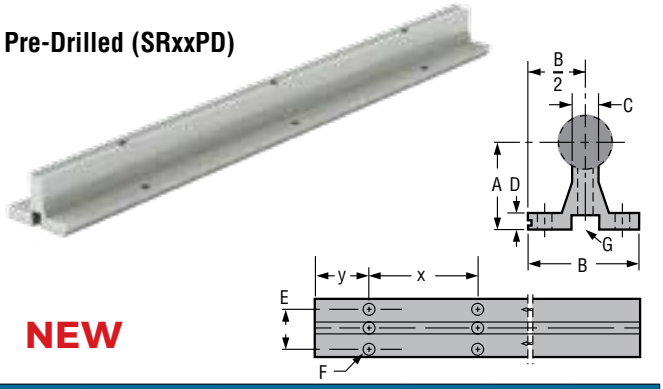


Pre-Drilled (SRxxPD)

NEW



Part No.		Nominal Dia.	A					H	G Mounting bolt Size		MAX Length	Standard Hole Spacing		Weight
Non-drilled	Pre-drilled	MM	+/-.05	B	C	D	E	Hole Size	Screw	Fastener Length mm	+0/-3.2 mm	x	y	Kg/M
SRM12	SRM12PD	12	28.00	38.10	6.60	4.76	25	M4	M4 x 0.70	20	1200	120	60	0.803
SRM16	SRM16PD	16	28.50	41.28	7.94	6.35	28	M5	M5 x 0.80	20	1200	150	75	1.040
SRM20	SRM20PD	20	38.00	44.45	9.53	6.35	32	M6	M6 x 1.00	30	1200	150	75	1.380
SRM25	SRM25PD	25	42.00	53.98	12.70	6.35	38	M8	M8 x 1.25	40	1200	200	100	1.860
SRM30	SRM30PD	30	53.00	63.50	14.29	7.94	46	M10	M10 x 1.5	40	1200	200	100	2.590
SRM40	SRM40PD	40	64.00	76.20	17.46	9.53	58	M10	M10 x 1.5	50	1200	200	100	3.750
SRM50	SRM50PD	50	82.00	95.25	22.23	12.70	70	M12	M12 x 1.75	70	1200	200	100	6.110

Notes: (1) Specify length in part number. Example: for 1/2" shafting support rail to 24" length = SR08-024.000 (Aluminum alloy construction).
(2) Shafts and support rails sold separately. Customer specifies 'y' dimension. Shaft rails and assemblies are available in long lengths, consult factory.

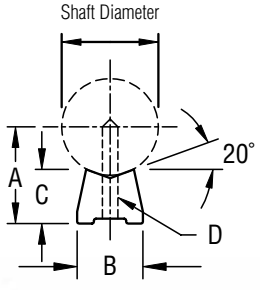
Shafting Low Support Rails

Low Support Rail – Steel LSRM

The AISI C-1018 steel LSR shaft support is a low support rail with a reduced footprint, and 40% lower profile than other support rails. This is an excellent choice for applications requiring compact low shaft support. The standard length for LSRM type supports is 1200 mm.

No coating

Length tolerance +0 mm/3 mm.

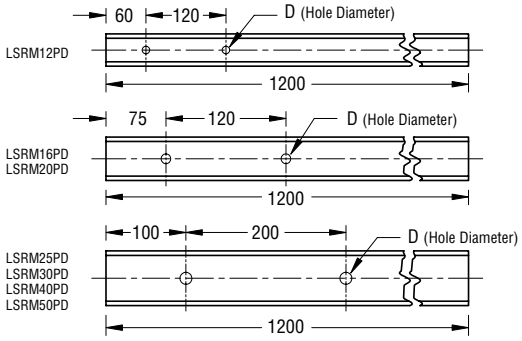


Part No.	Assembly Part No.	Shaft Dia.	A	B	C	D	Standard Hole spacing pre-drilled		Weight per 1219 mm (approximate)	Assemply Weight per 1200 mm (approximate)
		MM	+/-.05	+/-.05	+/-.05	Hole Size	X	Y	Kg	Kg
LSRM12	LSRAM-12	12	13.91	9.40	8.66	M4	120	60	0.599	1.79
LSRM12PD										
LSRM16	LSRAM-16	16	17.54	11.43	10.46	M5	150	75	0.884	2.76
LSRM16PD										
LSRM20	LSRAM-20	20	19.58	12.95	10.46	M6	150	75	1.020	3.61
LSRM20PD										
LSRM25	LSRAM-25	25	25.22	17.53	14.22	M8	200	100	5.086	5.86
LSRM25PD										
LSRM30	LSRAM-30	30	29.26	19.81	15.9	M10	200	100	8.800	8.80
LSRM30PD										
LSRM40	LSRAM-40	40	35.96	23.62	17.86	M10	200	100	12.700	12.70
LSRM40PD										
LSRM50	LSRAM-50	50	44.02	29.97	21.46	M12	200	100	21.980	21.98
LSRM50PD										

How to order

NEW

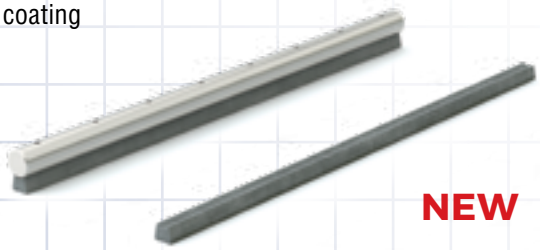
- When ordering standard 1200 mm long low shaft rails without mounting holes, order by part number. For example, LSRM-1200.
- If standard mounting holes are required, specify low shaft rails with pre-drilled mounting holes by part number. For example, LSR12PD. Hole sizes and spacings are shown in the table.
- If other than standard hole spacing is required, please provide drawings with all dimensions, tolerances, and quantity. With or without mounting holes, low shaft rails will be supplied in 1200 mm lengths when ordered by part number.



Low Support Rail & Shaft Set LSG

Precision case hardened and ground shaft, plus an LSR steel support rail, effectively doubles the life of the shaft by allowing it to be turned over for a fresh surface when wear becomes evident. Both sides of the shaft are counterbored so the shaft may be rotated 180°, and rebolted for use on the new side. This guide is sold as a two-piece set; the shaft and support are not assembled. The guide is then bolted down through the top of the shaft to reduce installation time. The shafts are also available in 440C stainless steel. Drilled through and counterbored shafts may not be suitable for all linear bearings.

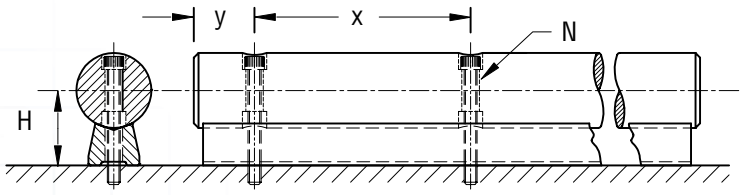
No coating



NEW

Part No.	Shaft Dia.	H	B	Y	X	N	Weight per in.
	MM	MM	MM	MM	MM	MM	Kg
LSGM16	16	17.54	11.43	75	150	#5	2.36
LSGM20	20	19.58	12.95	75	150	#6	3.05
LSGM25	25	25.22	17.53	100	200	#10	5.55
LSGM30	30	29.26	19.81	100	200	5/16	8.11
LSGM40	40	35.96	23.62	100	200	3/8	11.43
LSGM50	50	44.02	29.97	100	200	1/2	19.98

Note: Customer specifies 'y' dimension.

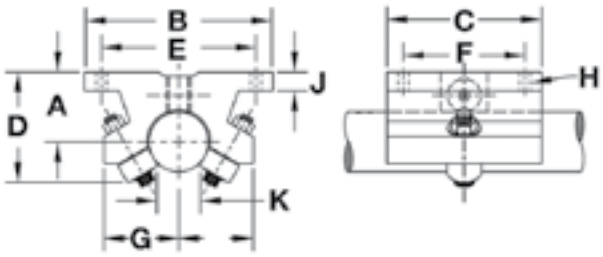


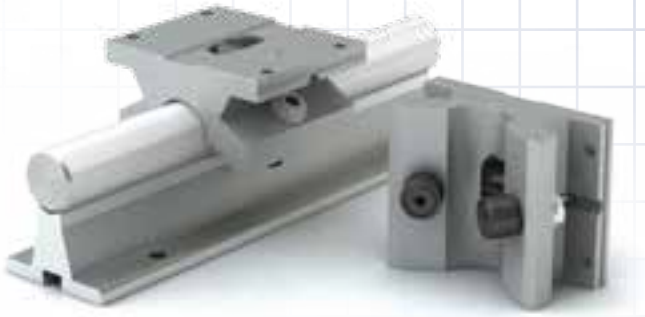
Roller Pillow Blocks

Single Roller Pillow Block MSPB_OPN

Low-friction single roller pillow blocks are selected for standard linear movement or for situations with shaft deflection. Self-aligning roller pillow blocks can handle a half of a degree in misalignment.

Note: To learn more about turning a curve with a single roller pillow block, please reference the technical information on page 14.





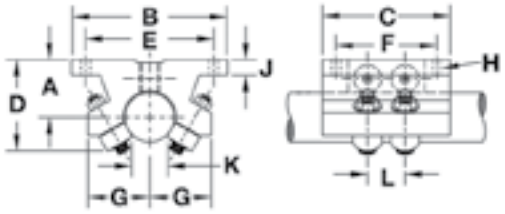
Configure

Metric Shafting Dimensions and Load Ratings

Part No.	Shaft Diameter	Dyn. Load Rating	Weight	A	B	C	D	E	F	G	H		J	K
	mm	lbs.	lbs.	±0.003	in.	in.	in.	±0.005	±0.005	in.	Bolt	Hole	in.	in.
MSPB-16-OPN	16	500	0.500	0.877	2-1/2	1-3/4	1-13/32	2.125	1.125	1-1/16	#8	3/16	0.270	3/8
MSPB-20-OPN	20	600	0.600	0.956	2-3/4	1-7/8	1-9/16	2.375	1.250	1-1/16	#8	3/16	0.300	7/16
MSPB-25-OPN	25	955	1.000	1.179	3-1/4	2-5/8	2	2.875	1.750	1-3/8	#10	7/32	0.360	11/16
MSPB-30-OPN	30	1400	2.000	1.465	4	3-3/8	2-9/16	3.500	2.000	1-3/4	#10	7/32	0.424	13/16

Double Roller Pillow Block MDPB_OPN

With double the capacity of the single roller pillow block, the double roller pillow blocks offer twice the dynamic load rating in a similar mounting footprint, and are used when longer travel life or an increase in load capacity is required.



Configure

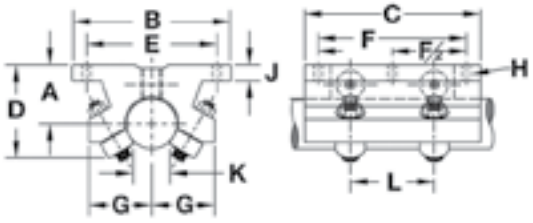
Metric Shafting Dimensions and Load Ratings

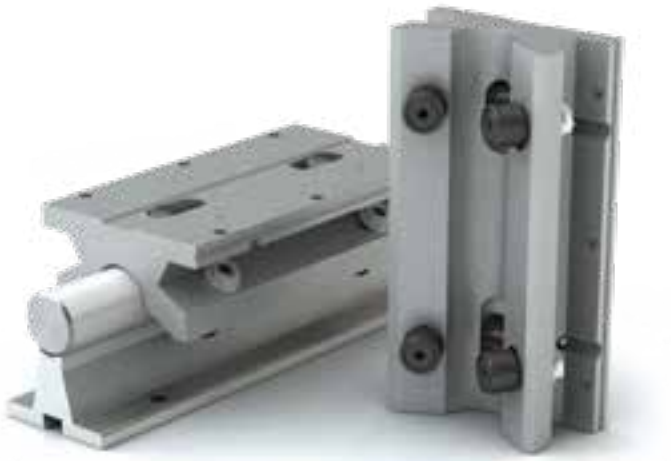
Part No.	Shaft Diameter	Dyn. Load Rating	Weight	A	B	C	D	E	F	G	H		J	K	L
	mm	lbs.	lbs.	±0.003	in.	in.	in.	±0.005	±0.005	in.	Bolt	Hole	in.	in.	in.
MDPB-16-OPN	16	1000	0.700	0.877	2-1/2	2-1/2	1-13/32	2.125	2.000	1-1/16	#8	3/16	0.270	3/8	0.562
MDPB-20-OPN	20	1200	0.800	0.956	2-3/4	2-5/8	1-9/16	2.375	1.250	1-1/16	#8	3/16	0.300	7/16	0.562
MDPB-25-OPN	25	1910	1.200	1.179	3-1/4	2-5/8	2	2.875	1.750	1-3/8	#10	7/32	0.360	11/16	0.720
MDPB-30-OPN	30	2800	3.000	1.465	4	3-3/8	2-9/16	3.500	2.000	1-3/4	#10	7/32	0.424	13/16	0.937

Roller Pillow Blocks

Single Roller Pillow Block MTWN_OPN

The twin roller pillow block load rating is the same as the double and is a good choice when using only one roller pillow block per shaft. The twin model also offers an additional pair of mounting holes.



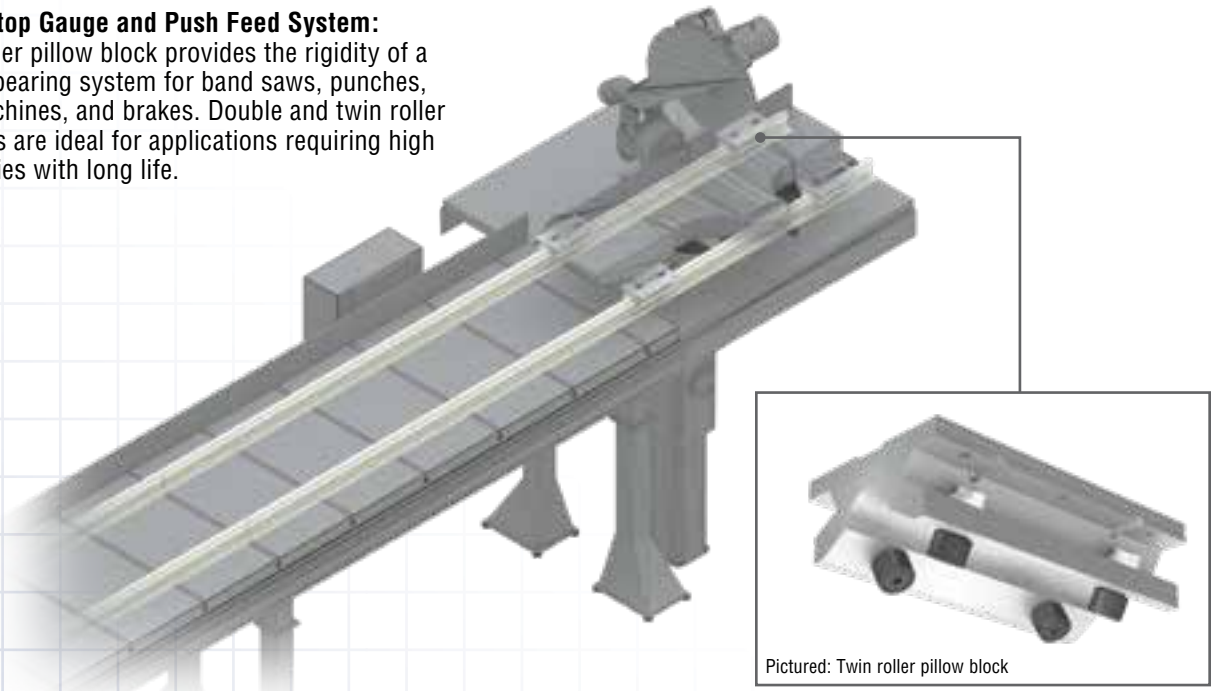


Configure

Metric Shafting Dimensions and Load Ratings

Part No.	Shaft Diameter	Dyn. Load Rating	Weight	A	B	C	D	E	F	G	H		J	K	L
	mm	lbs.	lbs.	±0.003	in.	in.	in.	±0.005	±0.005	in.	Bolt	Hole	in.	in.	in.
MTWN-16-OPN	16	1000	1.000	0.877	2-1/2	4	1-13/32	2.125	3.000	1-1/16	#8	3/16	0.270	3/8	2.125
MTWN-20-OPN	20	1200	1.200	0.956	2-3/4	4-1/2	1-9/16	2.375	3.500	1-1/16	#8	3/16	0.300	7/16	2.500
MTWN-25-OPN	25	1910	2.300	1.179	3-1/4	6	2	2.875	4.500	1-3/8	#10	7/32	0.360	11/16	3.750
MTWN-30-OPN	30	2800	4.400	1.465	4	7-1/2	2-9/16	3.500	5.500	1-3/4	#10	7/32	0.424	13/16	4.625

Industrial Stop Gauge and Push Feed System:
The twin roller pillow block provides the rigidity of a heavy duty bearing system for band saws, punches, bending machines, and brakes. Double and twin roller pillow blocks are ideal for applications requiring high load capacities with long life.

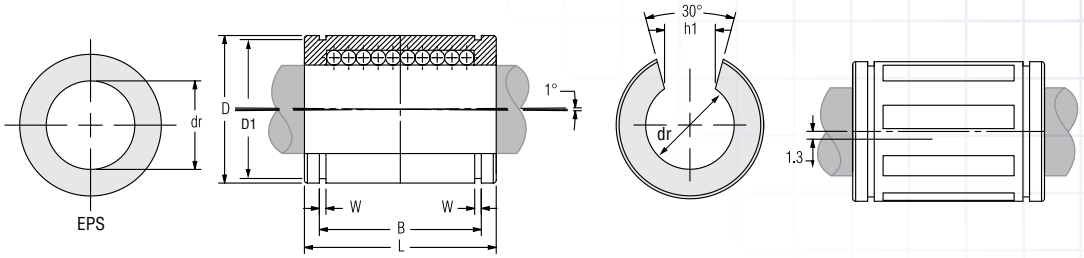


Pictured: Twin roller pillow block

Linear Ball Bearings Self Aligning

Self Aligning Ball Bearings EPS & EPS_OP

Configure



EPS – Self Aligning Closed

EPSxx-OP – Self Aligning Open

Dimensional Information

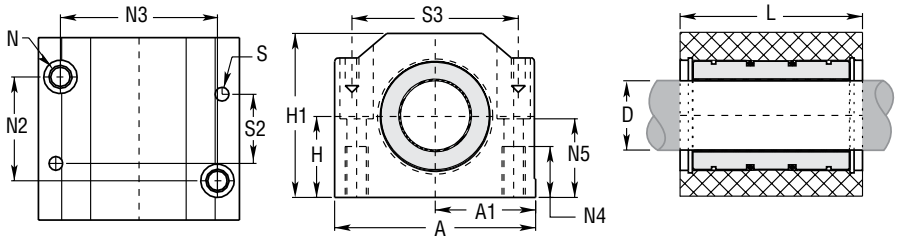
Part No. Self Aligning Closed	Nominal Diameter			Ball Circuit	Weight	Major Dimensions & Tolerances							Load Ratings	
	Size	dr	Tolerance			D	L	Tolerance	B	Tolerance	W	D1	Dynamic C	Static CO
	mm	mm	mm		g	mm	mm	mm	mm	mm	mm	mm	N	N
EPS16	16	16	0/-.013	5	26	26	36	0/-.51	24.6	0/-.51	1.30	24.9	1176	607
EPS20	20	20	0/-.013	6	60	32	45	0/-.51	31.2	0/-.51	1.60	30.5	2352	1254
EPS25	25	25	0/-.013	6	120	40	58	0/-.51	43.7	0/-.51	1.85	38.5	4508	2195
EPS30	30	30	0/-.013	6	184	47	68	0/-.64	51.7	0/-.64	1.85	44.5	5586	2959
EPS40	40	40	0/-.013	6	342	62	80	0/-.76	60.3	0/-.76	2.15	58.5	9310	4312
EPS50	50	50	0/-.013	6	586	75	100	0/-1.02	77.3	0/-1.02	2.65	71.5	13720	6762

Dimensional Information

Part No. Self Aligning Open	Nominal Diameter			Ball Circuit	Weight	Major Dimensions & Tolerances									Load Ratings	
	Size	dr	Tolerance			D	L	Tolerance	B	Tolerance	W	D1	h1	J	Dynamic C	Static CO
	mm	mm	mm		g	mm	mm	mm	mm	mm	mm	mm	mm	mm	N	N
EPS16-OP	16	16	0/-.013	4	20	26	36	0/-.51	24.6	0/-.51	1.30	24.9	.313	through	1332	715
EPS20-OP	20	20	0/-.013	5	50	32	45	0/-.51	31.2	0/-.51	1.60	30.5	.375	.0390	2371	1276
EPS25-OP	25	25	0/-.013	5	100	40	58	0/-.51	43.7	0/-.51	1.85	38.5	.438	.0590	4557	2234
EPS30-OP	30	30	0/-.013	5	154	47	68	0/-.64	51.7	0/-.64	1.85	44.5	.563	.0470	5644	3018
EPS40-OP	40	40	0/-.013	5	286	62	80	0/-.76	60.3	0/-.76	2.15	58.5	.625	.0900	9398	4410
EPS50-OP	50	50	0/-.013	5	486	75	100	0/-1.02	77.3	0/-1.02	2.65	71.5	.750	.0900	13857	6860

Linear Ball Bearings Pillow Blocks

Ball Bearings – Closed Pillow Blocks EPPM

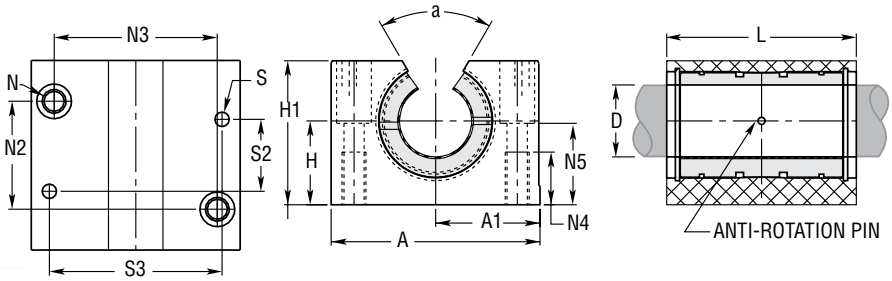


Part No.	D Nom. Brg. I.D.	H	H1	A	A1	L	N	N2	N3	N4	N5	S	S2	S3	Assem. Wt.	Load Ratings	
		Centerline +/- .015	Height	Width	Centerline +/- .013	Length										Dynamic C	Static Co
Precision	mm	mm	mm	mm	mm	mm	Bolt	mm	mm	mm	mm	mm	mm	mm	kg.	N	N
EPPM08G	8	15	28	35	17.5	32	M4 x 0.7	20.15	25.15	9	14.5	N/A	N/A	N/A	0.069	260	400
EPPM10G	10	16	31.5	40	20	36	M5 x 0.8	20.15	29.15	11	15	4	29	31	0.095	372	549
EPPM12G	12	18	35	43	21.5	39	M5 x 0.8	23.15	3 .15	11	16.5	4	32	34	0.118	410	590
EPPM16G	16	22	42	53	26.5	43	M6 x 1.0	26.15	40.15	13	21	4	35	42	0.200	770	1170
EPPM20G	20	25	50	60	30	54	M8 x 1.25	32.15	45.15	18	24	5	45	50	0.329	860	1370
EPPM25G	25	30	60	78	39	67	M10 x 1.5	40.15	60.15	22	29	6	20	64	0.655	980	1560
EPPM30G	30	35	71	87	43.5	79	M10 x 1.5	45.15	68.15	22	34	6	30	72	1.020	1560	2740
EPPM40G	40	45	91	108	54	91	M12 x 1.75	58.15	86.15	26	44	8	35	90	1.846	2150	4010
EPPM50G	50	50	105	132	66	113	M16 x 2.0	50.20	108.2	34	49	10	42	108	3.169	3820	7930

Notes: (1) Standard pillow block assembly includes self-aligning housing.
(2) All standard metric pillow blocks use standard EP series bearings.
(3) Straight bore pillow block assembly includes standard EP series bearing in straight bore housing.

Configure

Ball Bearings – Open Pillow Blocks EPPMN



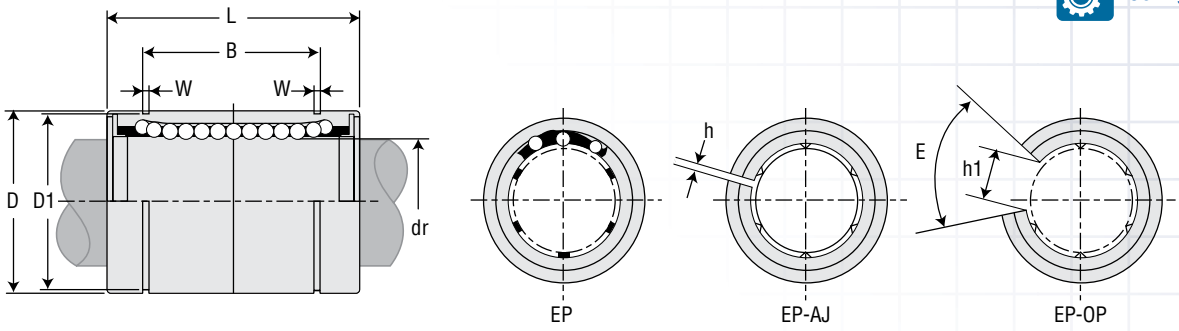
Part No.	D Nom. Brg. I.D.	H	H1	A	A1	L	N	N2	N3	N4	N5	S	S2	S3	A	Assem. Wt.	Load Ratings	
		Centerline +/- .015	Height	Width	Centerline +/- .013	Length											Dynamic C	Static CO
Precision	mm	mm	mm	mm	mm	mm	Bolt	mm	mm	mm	mm	mm	mm	mm	mm	kg.	N	N
EPPMN12G	12	18	28	43	21.5	39	M5 x 0.8	23.15	32.15	11	16.5	4	32	34	66	0.096	410	590
EPPMN16G	16	22	35	53	26.5	43	M6 x 1.0	26.15	40.15	13	21	4	35	42	68	0.162	770	1170
EPPMN20G	20	25	42	60	30	54	M8 x 1.25	32.15	45.15	18	24	5	45	50	60	0.267	860	1370
EPPMN25G	25	30	51	78	39	67	M10 x 1.5	40.15	60.15	22	29	6	20	64	60	0.536	980	1560
EPPMN30G	30	35	60	87	43.5	79	M10 x 1.5	45.15	68.15	22	34	6	30	72	60	0.831	1560	2740
EPPMN40G	40	45	77	108	54	91	M12 x 1.75	58.15	86.15	26	44	8	35	90	60	1.499	2150	4010
EPPMN50G	50	50	88	132	66	113	M16 x 2.0	50.20	108.2	34	49	10	42	108	60	2.539	3820	7930

Notes: (1) Standard pillow block assembly includes self-aligning housing.
(2) All standard metric pillow blocks use standard EP series bearings.

Linear Ball Bearings Standard

Ball Bearings EP

Configure



EP – Standard Closed

EPxx-AJ – Adjustable

EPxx-OP – Standard Open

Dimensional Information

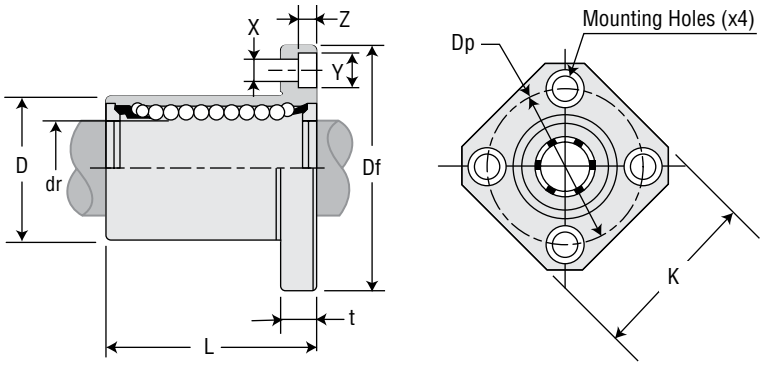
(Standard Steel Finish)

Part No.			Nominal Diameter					Major Dimensions & Tolerances					
Standard Closed	Adjustable	Standard Open	Size	dr	Tolerance	Ball Circuit	Weight	D	Tolerance	L	Tolerance	B	Tolerance
			mm	mm	mm		g	mm	mm	mm	mm	mm	mm
EP5G	-	-	5	5	+.008/0	4	11	12	0/-.008	22	0/-0.2	14.5	0/-0.2
EP8G	-	-	8	8	+.008/0	4	20	16	0/-.008	25	0/-0.2	16.5	0/-0.2
EP10G	-	-	10	10	+.008/0	4	36	19	0/-.009	29	0/-0.2	22	0/-0.2
EP12G	EP12G-AJ	EP12G-OP	12	12	+.008/0	5	41	22	0/-.009	32	0/-0.2	22.9	0/-0.2
EP16G	EP16G-AJ	EP16G-OP	16	16	+.009/-.001	5	65	26	0/-.009	36	0/-0.2	24.9	0/-0.2
EP20G	EP20G-AJ	EP20G-OP	20	20	+.009/-.001	5	91	32	0/-.011	45	0/-0.2	31.5	0/-0.2
EP25G	EP25G-AJ	EP25G-OP	25	25	+.011/-.001	6	215	40	0/-.011	58	0/-0.3	44.1	0/-0.3
EP30G	EP30G-AJ	EP30G-OP	30	30	+.011/-.001	6	325	47	0/-.011	68	0/-0.3	52.1	0/-0.3
EP40G	EP40G-AJ	EP40G-OP	40	40	+.013/-.002	6	705	62	0/-.013	80	0/-0.3	60.6	0/-0.3
EP50G	EP50G-AJ	EP50G-OP	50	50	+.013/-.002	6	1130	75	0/-.013	100	0/-0.3	77.6	0/-0.3

Part No.			Nominal Diameter			Major Dimensions & Tolerances							Load Ratings	
Standard Closed	Adjustable	Standard Open	Size	dr	Tolerance	W	D1	H	H1	E Slot Angle	MAX Eccentricity	MAX Radial Clearance	Dynamic C	Static CO
			mm	mm	mm	mm	mm	mm	mm		µm	µm	N	N
EP5G	-	-	5	5	+.008/0	1.1	11.5	-	-	-	12	-5	200	260
EP8G	-	-	8	8	+.008/0	1.1	15.2	-	-	-	12	-5	260	400
EP10G	-	-	10	10	+.008/0	1.3	18	-	-	-	12	-5	372	549
EP12G	EP12G-AJ	EP12G-OP	12	12	+.008/0	1.3	21	1.5	7.5	78°	12	-7	410	590
EP16G	EP16G-AJ	EP16G-OP	16	16	+.009/-.001	1.3	24.9	1.5	10	78°	12	-7	770	1170
EP20G	EP20G-AJ	EP20G-OP	20	20	+.009/-.001	1.6	30.3	2	10	60°	15	-9	860	1370
EP25G	EP25G-AJ	EP25G-OP	25	25	+.011/-.001	1.85	37.5	2	12.5	60°	15	-9	980	1560
EP30G	EP30G-AJ	EP30G-OP	30	30	+.011/-.001	1.85	44.5	2	12.5	50°	15	-9	1560	2740
EP40G	EP40G-AJ	EP40G-OP	40	40	+.013/-.002	2.15	59	3	16.8	50°	17	-13	2150	4010
EP50G	EP50G-AJ	EP50G-OP	50	50	+.013/-.002	2.65	72	3	21	50°	17	-13	3820	7930

Linear Ball Bearings Square Flange Mount

Ball Bearings – Square Flange Mount EPK



Dimensional Information

(Standard Steel Finish)

Part No.	Nominal Diameter			Ball Circuit	Weight	Major Dimensions & Tolerances			
Standard Polymer Cage	Size	dr	Tolerance			D	Tolerance	L	Tolerance
	mm	mm	mm		g	mm	mm	mm	mm
EPK8G	8	8	+.008/0	4	41	16	0/-.013	25	±0.3
EPK12G	12	12	+.008/0	4	80	22	0/-.016	32	±0.3
EPK16G	16	16	+.009/-.001	5	103	26	0/-.016	36	±0.3
EPK20G	20	20	+.009/-.001	5	182	32	0/-.019	45	±0.3
EPK25G	25	25	+.011/-.001	6	335	40	0/-.019	58	±0.3
EPK30G	30	30	+.011/-.001	6	560	47	0/-.019	68	±0.3
EPK40G	40	40	+.013/-.002	6	1175	62	0/-.022	80	±0.3
EPK50G	50	50	+.013/-.002	6	1745	75	0/-.022	100	±0.3

Configure

Part No.	Nominal Diameter			Major Dimensions & Tolerances – Flange									Load Ratings	
Standard Polymer Cage	Size	dr	Tolerance	Df	K	T	Dp	X	Y	Z	Eccentricity	Squareness	Dynamic C	Static CO
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	µm	µm	n	N
EPK8G	8	8	+.008/0	32	25	5	24	3.5	6.5	3.1	12	12	265	402
EPK12G	12	12	+.008/0	42	32	6	32	4.5	8	4.1	12	12	510	784
EPK16G	16	16	+.009/-.001	46	35	6	36	4.5	8	4.1	12	12	578	892
EPK20G	20	20	+.009/-.001	54	42	8	43	5.5	9.3	5.1	15	15	862	1370
EPK25G	25	25	+.011/-.001	62	50	8	51	5.5	9.3	5.1	15	15	980	1570
EPK30G	30	30	+.011/-.001	76	60	10	62	6.6	11	6.1	15	15	1570	2740
EPK40G	40	40	+.013/-.002	98	75	13	80	9	14	8.1	17	17	2160	4020
EPK50G	50	50	+.013/-.002	112	88	13	94	9	14	8.1	17	17	3820	7940

Only certified 60 Plus Shafting provides Maximum linear bearing performance.

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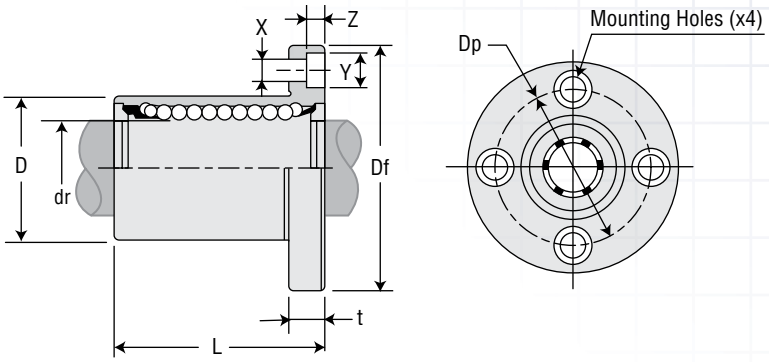
Linear Ball Bearings Round Flange Mount

Ball Bearings – Round Flange Mount EPF



Dimensional Information

(Standard Steel Finish)

Part No.	Nominal Diameter			Ball Circuit	Weight	Major Dimensions & Tolerances			
Standard Polymer Cage	Size	dr	Tolerance			D	Tolerance	L	Tolerance
	mm	mm	mm		g	mm	mm	mm	mm
EPF8G	8	8	+.008/0	4	41	16	0/-.013	25	±0.3
EPF12G	12	12	+.008/0	4	80	22	0/-.016	32	±0.3
EPF16G	16	16	+.009/-.001	5	103	26	0/-.016	36	±0.3
EPF20G	20	20	+.009/-.001	5	182	32	0/-.019	45	±0.3
EPF25G	25	25	+.011/-.001	6	335	40	0/-.019	58	±0.3
EPF30G	30	30	+.011/-.001	6	560	47	0/-.019	68	±0.3
EPF40G	40	40	+.013/-.002	6	1175	62	0/-.022	80	±0.3
EPF50G	50	50	+.013/-.002	6	1745	75	0/-.022	100	±0.3

Configure

Part No.	Nominal Diameter			Major Dimensions & Tolerances – Flange								Load Ratings	
Standard Polymer Cage	Size	dr	Tolerance	DF	T	DP	X	Y	Z	Eccentricity	Squareness	Dynamic C	Static CO
	mm	mm	mm	mm	mm	mm	mm	mm	mm	µm	µm	N	N
EPF8G	8	8	+.008/0	32	5	24	3.5	6.5	3.1	12	12	265	402
EPF12G	12	12	+.008/0	42	6	32	4.5	8	4.1	12	12	510	784
EPF16G	16	16	+.009/-.001	46	6	36	4.5	8	4.1	12	12	578	892
EPF20G	20	20	+.009/-.001	54	8	43	5.5	9.3	5.1	15	15	862	1370
EPF25G	25	25	+.011/-.001	62	8	51	5.5	9.3	5.1	15	15	980	1570
EPF30G	30	30	+.011/-.001	76	10	62	6.6	11	6.1	15	15	1570	2740
EPF40G	40	40	+.013/-.002	98	13	80	9	14	8.1	17	17	2160	4020
EPF50G	50	50	+.013/-.002	112	13	94	9	14	8.1	17	17	3820	7940

Only certified 60 Plus Shafting provides Maximum linear bearing performance.

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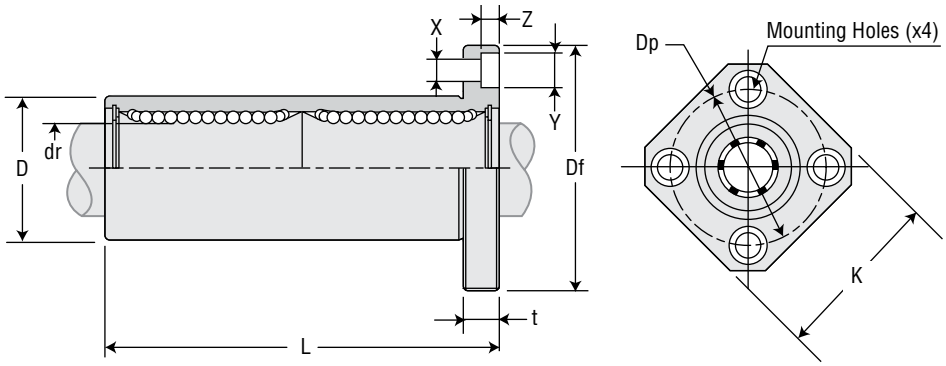
Linear Ball Bearings Double Wide

Double Wide Ball Bearings – Square Flange Mount EPK_W



Dimensional Information

(Standard Steel Finish)

Part No.	Nominal Diameter			Ball Circuit	Weight	Major Dimensions & Tolerances			
Standard Polymer Cage	Size	dr	Tolerance			D	Tolerance	L	Tolerance
	mm	mm	mm		g	mm	mm	mm	mm
EPK8GW	8	8	+.009/-.001	4	51	16	0/-.013	45	±0.3
EPK12GW	12	12	+.009/-.001	4	90	22	0/-.016	57	±0.3
EPK16GW	16	16	+.011/-.001	5	135	26	0/-.016	70	±0.3
EPK20GW	20	20	+.011/-.001	5	225	32	0/-.019	80	±0.3
EPK25GW	25	25	+.013/-.002	6	500	40	0/-.019	112	±0.3
EPK30GW	30	30	+.013/-.002	6	720	47	0/-.019	123	±0.3
EPK40GW	40	40	+.016/-.004	6	1600	62	0/-.022	154	±0.3
EPK50GW	50	50	+.016/-.004	6	2620	75	0/-.022	192	±0.3

Configure

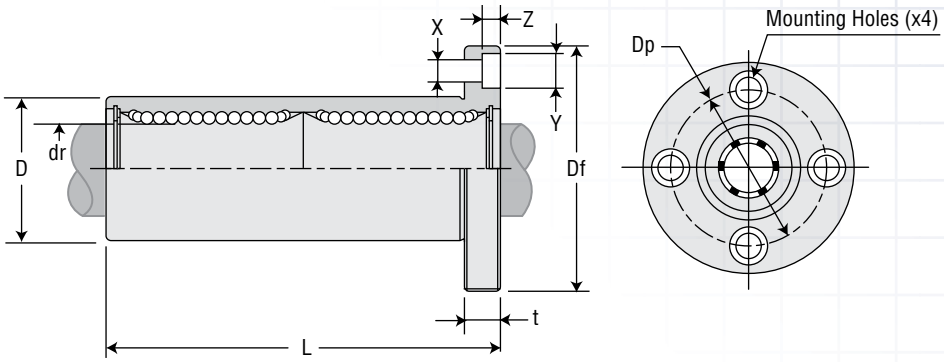
Part No.	Nominal Diameter			Major Dimensions & Tolerances – Flange									Load Ratings	
Standard Polymer Cage	Size	dr	Tolerance	Df	K	T	Dp	X	Y	Z	Eccentricity	Squareness	Dynamic C	Static CO
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	µm	µm	N	N
EPK8GW	8	8	+.009/-.001	32	25	5	24	3.5	6.5	3.1	15	15	421	804
EPK12GW	12	12	+.009/-.001	42	32	6	32	4.5	8	4.1	15	15	813	1570
EPK16GW	16	16	+.011/-.001	46	35	6	36	4.5	8	4.1	15	15	921	1780
EPK20GW	20	20	+.011/-.001	54	42	8	43	5.5	9.3	5.1	17	17	1370	2740
EPK25GW	25	25	+.013/-.002	62	50	8	51	5.5	9.3	5.1	17	17	1570	3140
EPK30GW	30	30	+.013/-.002	76	60	10	62	6.6	11	6.1	17	17	2500	5490
EPK40GW	40	40	+.016/-.004	98	75	13	80	9	14	8.1	20	20	3430	8040
EPK50GW	50	50	+.016/-.004	112	88	13	94	9	14	8.1	20	20	6080	15900

Only certified 60 Plus Shafting provides Maximum linear bearing performance.

Inch Series–page 3 Metric Series–page 40

Linear Ball Bearings Double Wide

Double Wide Ball Bearings – Round Flange Mount EPF_W



Dimensional Information

(Standard Steel Finish)

Part No.	Nominal Diameter			Ball Circuit	Weight	Major Dimensions & Tolerances			
Standard Polymer Cage	Size	dr	Tolerance			D	Tolerance	L	Tolerance
	mm	mm	mm		g	mm	mm	mm	mm
EPF8GW	8	8	+.009/-.001	4	59	16	0/-.013	45	±0.3
EPF12GW	12	12	+.009/-.001	4	110	22	0/-.016	57	±0.3
EPF16GW	16	16	+.011/-.001	5	160	26	0/-.016	70	±0.3
EPF20GW	20	20	+.011/-.001	5	260	32	0/-.019	80	±0.3
EPF25GW	25	25	+.013/-.002	6	540	40	0/-.019	112	±0.3
EPF30GW	30	30	+.013/-.002	6	815	47	0/-.019	123	±0.3
EPF40GW	40	40	+.016/-.004	6	1805	62	0/-.022	154	±0.3
EPF50GW	50	50	+.016/-.004	6	2820	75	0/-.022	192	±0.3

Configure

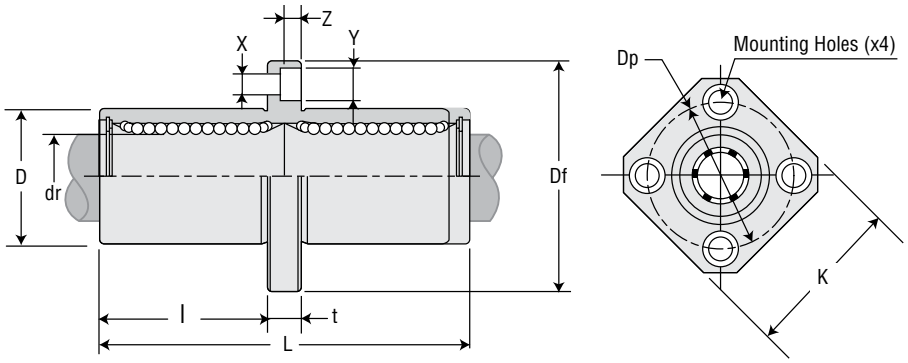
Part No.	Nominal Diameter			Major Dimensions & Tolerances – Flange								Load Ratings	
Standard Polymer Cage	Size	dr	Tolerance	DF	T	Dp	X	Y	Z	Eccentricity	Squareness	Dynamic C	Static CO
	mm	mm	mm	mm	mm	mm	mm	mm	mm	µm	µm	n	N
EPF8GW	8	8	+.009/-.001	32	5	24	3.5	6.5	3.1	15	15	421	804
EPF12GW	12	12	+.009/-.001	42	6	32	4.5	8	4.1	15	15	813	1570
EPF16GW	16	16	+.011/-.001	46	6	36	4.5	8	4.1	15	15	921	1780
EPF20GW	20	20	+.011/-.001	54	8	43	5.5	9.3	5.1	17	17	1370	2740
EPF25GW	25	25	+.013/-.002	62	8	51	5.5	9.3	5.1	17	17	1570	3140
EPF30GW	30	30	+.013/-.002	76	10	62	6.6	11	6.1	17	17	2500	5490
EPF40GW	40	40	+.016/-.004	98	13	80	9	14	8.1	20	20	3430	8040
EPF50GW	50	50	+.016/-.004	112	13	94	9	14	8.1	20	20	6080	15900

Only certified 60 Plus Shafting provides Maximum linear bearing performance.

Inch Series–page 3 Metric Series–page 40

Linear Ball Bearings Square Flange Center Mount

Ball Bearings – Square Flange Center Mount EPKC



Dimensional Information

(Standard Steel Finish)

Part No.	Nominal Diameter			Ball Circuit	Weight	Major Dimensions & Tolerances			
Standard Polymer Cage	Size	dr	Tolerance			D	Tolerance	L	Tolerance
	mm	mm	µm		g	mm	µm	mm	µm
EPKC8G	8	8	+9/-1	4	51	16	0/-13	45	±300
EPKC12G	12	12	+9/-1	4	90	22	0/-16	57	±300
EPKC16G	16	16	+11/-1	5	135	26	0/-16	70	±300
EPKC20G	20	20	+11/-1	5	225	32	0/-19	80	±300
EPKC25G	25	25	+13/-2	6	500	40	0/-19	112	±300
EPKC30G	30	30	+13/-2	6	720	47	0/-19	123	±300
EPKC40G	40	40	+16/-4	6	1600	62	0/-22	154	±300
EPKC50G	50	50	+16/-4	6	2620	75	0/-22	192	±300

Configure

Part No.	Nominal Diameter			Major Dimensions & Tolerances – Flange										Load Ratings	
Standard Polymer Cage	Size	dr	Tolerance	l	DF	K	T	DP	X	Y	Z	Eccentricity	Squareness	Dynamic C	Static CO
	mm	mm	µm	mm	mm	mm	mm	mm	mm	mm	mm	µm	µm	n	N
EPKC8G	8	8	+9/-1	20.5	32	25	5	24	3.5	6.5	3.1	15	15	421	804
EPKC12G	12	12	+9/-1	27.5	42	32	6	32	4.5	8	4.1	15	15	813	1570
EPKC16G	16	16	+11/-1	31	46	35	6	36	4.5	8	4.1	15	15	921	1780
EPKC20G	20	20	+11/-1	36	54	42	8	43	5.5	9.3	5.1	17	17	1370	2740
EPKC25G	25	25	+13/-2	52	62	50	8	51	5.5	9.3	5.1	17	17	1570	3140
EPKC30G	30	30	+13/-2	56.5	76	60	10	62	6.6	11	6.1	17	17	2500	5490
EPKC40G	40	40	+16/-4	69	98	75	13	80	9	14	8.1	20	20	3430	8040
EPKC50G	50	50	+16/-4	89.5	112	88	13	94	9	14	8.1	20	20	6080	15900

Only certified 60 Plus Shafting provides Maximum linear bearing performance.

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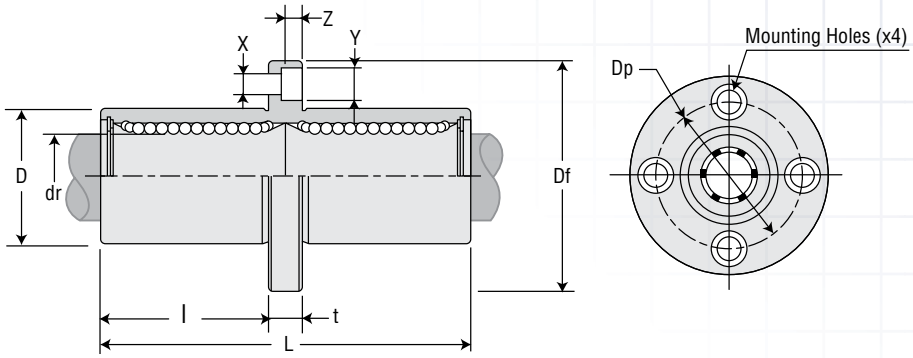
Linear Ball Bearings Round Flange Center Mount

Ball Bearings – Round Flange Center Mount EPFC



Dimensional Information

(Standard Steel Finish)

Part No.	Nominal Diameter			Ball Circuit	Weight	Major Dimensions & Tolerances			
Standard Polymer Cage	Size	dr	Tolerance			D	Tolerance	L	Tolerance
	mm	mm	µm		g	mm	µm	mm	µm
EPFC8G	8	8	+9/-1	4	59	16	0/-13	45	±300
EPFC12G	12	12	+9/-1	4	110	22	0/-16	57	±300
EPFC16G	16	16	+11/-1	5	160	26	0/-16	70	±300
EPFC20G	20	20	+11/-1	5	260	32	0/-19	80	±300
EPFC25G	25	25	+13/-2	6	540	40	0/-19	112	±300
EPFC30G	30	30	+13/-2	6	815	47	0/-19	123	±300
EPFC40G	40	40	+16/-4	6	1805	62	0/-22	154	±300
EPFC50G	50	50	+16/-4	6	2820	75	0/-22	192	±300

Configure

Part No.	Nominal Diameter			Major Dimensions & Tolerances – Flange									Load Ratings	
Standard Polymer Cage	Size	dr	Tolerance	l	Df	T	Dp	X	Y	Z	Eccentricity	Squareness	Dynamic C	Static CO
	mm	mm	µm	mm	mm	mm	mm	mm	mm	mm	µm	µm	N	N
EPFC8G	8	8	+9/-1	20.5	32	5	24	3.5	6.5	3.1	15	15	421	804
EPFC12G	12	12	+9/-1	27.5	42	6	32	4.5	8	4.1	15	15	813	1570
EPFC16G	16	16	+11/-1	31	46	6	36	4.5	8	4.1	15	15	921	1780
EPFC20G	20	20	+11/-1	36	54	8	43	5.5	9.3	5.1	17	17	1370	2740
EPFC25G	25	25	+13/-2	52	62	8	51	5.5	9.3	5.1	17	17	1570	3140
EPFC30G	30	30	+13/-2	56.5	76	10	62	6.6	11	6.1	17	17	2500	5490
EPFC40G	40	40	+16/-4	69	98	13	80	9	14	8.1	20	20	3430	8040
EPFC50G	50	50	+16/-4	89.5	112	13	94	9	14	8.1	20	20	6080	15900

Only certified 60 Plus Shafting provides Maximum linear bearing performance.

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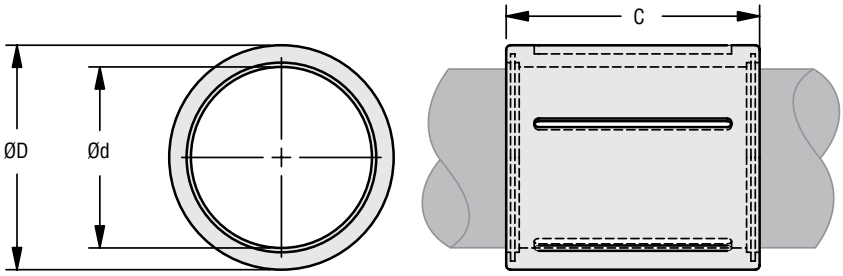
Linear Ball Bearings Compact Thin Wall

Ball Bearings – Compact Thin Wall KHP



Configure

Dimensional Information

(Standard Steel Finish)

Part No.	Dimensions							Load Rating	
	ØD	Tolerance	ØD	Tolerance	C	Tolerance	Weight	Dynamic C	Static CO
	mm	µm	mm	µm	mm	µm	g	N	N
KHP6	6	0/+12	12	-11/0	22	-520/0	7	400	239
KHP8	8	0/+15	15	-11/0	24	-520/0	12	435	280
KHP10	10	0/+15	17	-11/0	26	-520/0	14.5	500	370
KHP12	12	0/+18	19	-13/0	28	-520/0	18.5	620	510
KHP14	14	0/+18	21	-13/0	28	-520/0	20.5	620	520
KHP16	16	0/+18	24	-13/0	30	-520/0	27.5	800	620
KHP20	20	0/+21	28	-13/0	30	-520/0	32.5	950	790
KHP25	25	0/+21	35	-16/0	40	-620/0	66	1990	1670
KHP30	30	0/+21	40	-16/0	50	-620/0	95	2880	2700
KHP40	40	0/+25	52	-19/0	60	-740/0	182	4400	4450
KHP50	50	0/+25	62	-19/0	70	-740/0	252	5500	6300

Only certified 60 Plus Shafting provides Maximum linear bearing performance.

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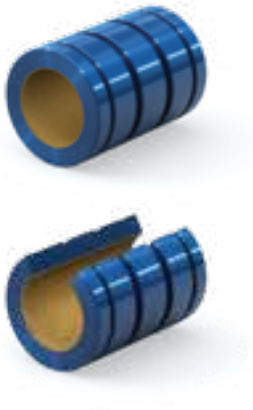
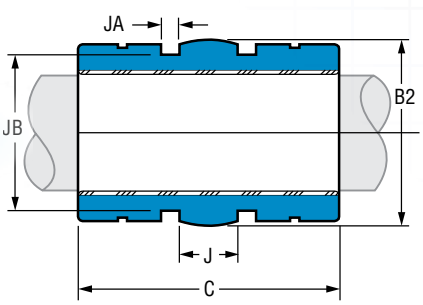
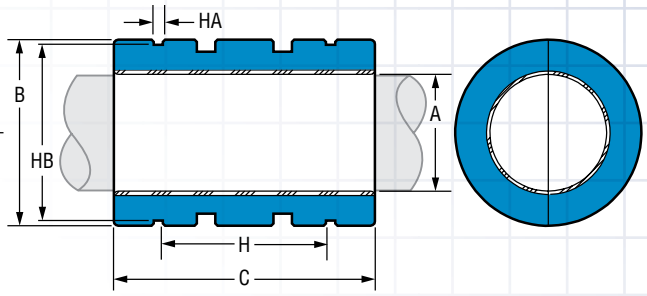
Simplicity® Linear Plain Bearings



*Self Aligning O.D. (FMA-XX)



Standard O.D. (FM-XX)



*Except for the O.D., bearings with the self-aligning feature have the same dimensions and tolerances as the standard bearing. There is a spherical crown on the O.D. to create the self-aligning feature. They are for use in a straight bore housing. Add an "A" to the part number for self-aligning bearings.

Dimensional Information

Precision I.D. Series Similar to Preloaded Ball Bearing					Compensated I.D. Series Similar to Standard Ball Bearing				B		B2					
Part No.		Nominal Size	A Bearing I.D. F8		Part No.		A Bearing I.D.		Standard O.D. H7		Self-Aligning O.D. FMA		C Length		Concentric	Bearing Weight
Closed	Open	mm	MIN	MAX	Closed	Open	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MAX mm	kg.
FM05	FMN05	5	5.010	5.028	FMC 05	FMCN 05	5.060	5.078	11.982	12	11.941	11.966	21.619	22	0.0254	0.004
FM08	FMN08	8	8.013	8.035	FMC 08	FMCN 08	8.063	8.085	15.982	16	15.941	15.966	24.619	25	0.0254	0.009
FM10	FMN10	10	10.013	10.035	FMC 10	FMCN 10	10.063	10.085	18.979	19	18.938	18.964	28.619	29	0.0254	0.014
FM12	FMN12	12	12.016	12.043	FMC 12	FMCN 12	12.066	12.093	21.979	22	21.938	21.963	31.619	32	0.0254	0.017
FM16	FMN16	16	16.016	16.043	FMC 16	FMCN 16	16.066	16.093	25.979	26	25.938	25.964	35.619	36	0.0254	0.028
FM20	FMN20	20	20.020	20.053	FMC 20	FMCN 20	20.096	20.129	31.975	32	31.938	31.963	44.619	45	0.0254	0.054
FM25	FMN25	25	25.020	25.053	FMC 25	FMCN 25	25.096	25.129	39.975	40	39.936	39.962	57.619	58	0.0254	0.109
FM30	FMN30	30	30.020	30.053	FMC 30	FMCN 30	30.096	30.129	46.975	47	46.937	46.962	67.619	68	0.0254	0.176
FM40	FMN40	40	40.025	40.064	FMC 40	FMCN 40	40.127	40.166	61.970	62	61.935	61.961	79.619	80	0.0254	0.356
FM50	FMN50	50	50.025	50.064	FMC 50	FMCN 50	50.127	50.166	74.970	75	74.935	74.960	99.619	100	0.0254	0.628
FM60	FMN60	60	60.030	60.076	FMC 60	FMCN 60	60.182	60.228	89.965	90	89.931	89.957	124.619	125	0.0380	1.117
FM80	FMN80	80	80.030	80.076	FMC 80	FMCN 80	80.182	80.228	119.965	120	119.931	119.957	164.619	165	0.0510	2.679

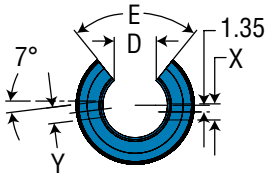
Mounting Dimensions

Part No.		Nominal Size mm	H Between Ret. Rings	HA Ret. Ring GRV. Width	HB Ret. Ring GRV. Dia.	Ret. Ring Part No. Din 471	J Between O'Ring Grvs.	JA O'Ring GRV. Width	JB O'ring GRV. Dia.	Metric O'ring Size
Closed	Open									
FM05	FMN05	5	12	1.14	11.5	12	5	2	9.86	9.7 x 1.3
FM08	FMN08	8	14	1.14	15.2	16	5.33	2	13.2	13 x 1.7
FM10	FMN10	10	19.4	1.32	18.0	19	5.63	2.44	15.7	15.5 x 2
FM12	FMN12	12	20	1.32	21.0	22	6	3.17	17.9	17.5 x 2.5
FM16	FMN16	16	22	1.32	24.9	26	8	3.17	21.9	21.5 x 2.5
FM20	FMN20	20	28	1.63	30.3	32	10	3.17	27.9	27.5 x 2.5
FM25	FMN25	25	40	1.90	37.5	40	12.5	3.17	35.9	35.5 x 2.5
FM30	FMN30	30	48	1.90	44.5	47	15	3.17	42.7	42.52 x 2.62
FM40	FMN40	40	56	2.20	59.0	62	20	4.1	56.3	56 x 3.5
FM50	FMN50	50	72	2.70	72.0	75	25	4.1	69.2	69 x 3.5
FM60	FMN60	60	95	3.20	86.4	90	30	7.1	81.7	81 x 5
FM80	FMN80	80	125	4.17	116.1	120	40	7.1	111.7	111 x 5

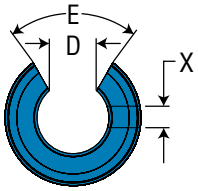
Linear Plain Bearings FMN

Configure

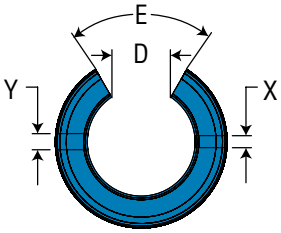
FMN 12 ONLY

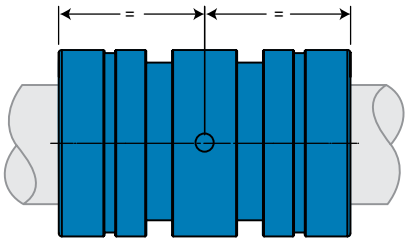


FMN 05 THRU FMN 10 & FMN 80



FMN 16 THRU FMN 20





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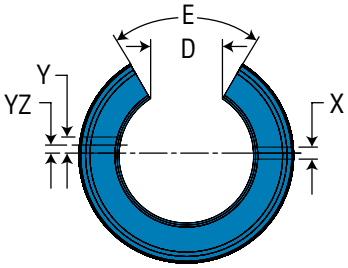
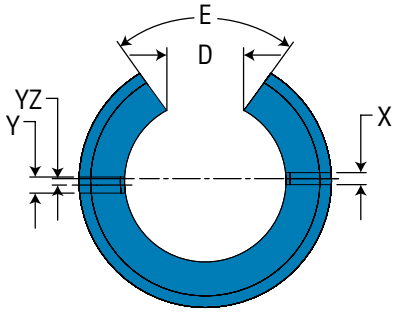
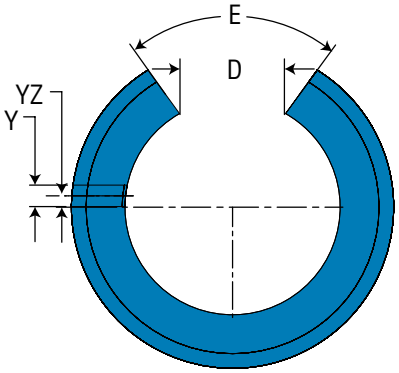


FMN 30 THRU FMN 50



FMN 60 ONLY



Open Dimensional Information

Part No.	Nominal Size mm	D Slot Wide MIN	E Slot Angle	X Ret. Hole Dia.	Y Ret. Hole Dia.	Yz Ret. Hole Locate	Bearing Wt. kg.
FMN05	5	3.2	60	2.2	N/A	N/A	0.0034
FMN08	8	5.1	60	3.0	N/A	N/A	0.0077
FMN10	10	6.4	60	3.0	N/A	N/A	0.0119
FMN12	12	7.6	78	3.0	3.0	7.0	0.0156
FMN16	16	10.4	78	2.2	3.0	0	0.0213
FMN20	20	10.8	60	2.2	3.0	0	0.0439
FMN25	25	13.2	60	3.0	3.0	1.5	0.0893
FMN30	30	14.2	72	3.0	3.0	2.0	0.1460
FMN40	40	19.5	72	3.0	3.0	1.5	0.2948
FMN50	50	24.0	72	3.0	5.0	2.5	0.5202
FMN60	60	29.6	72	N/A	6.0	0	0.9199
FMN80	80	39.0	72	N/A	8.0	0	2.2269

Load & Speed Data

Part No.	Effective Surface Area sq. in.	MAX Static Load lbs. Frelon® GOLD	MAX Static Load lbs. Frelon® J	Effective Surface Area cm^2	MAX Static Load N Frelon GOLD	MAX Static Load N Frelon J & W
FMN05	0.171	511	256	1.10	2276	1138
FMN08	0.310	926	463	2.00	4120	2060
FMN10	0.450	1345	672	2.90	5984	2992
FMN12	0.589	1777	888	3.80	7907	3953
FMN16	0.899	2667	1334	5.80	11870	5935
FMN20	1.395	4167	2083	9.00	18541	9270
FMN25	2.248	6715	3358	1.450	29881	14941
FMN30	3.162	9444	4722	2.040	42026	21013
FMN40	4.960	14814	7407	3.200	65923	32962
FMN50	7.750	23147	11574	5.000	103005	51503
FMN60	11.625	34721	17360	7.500	154508	77254
FMN80	20.460	61120	30554	13.200	271933	135967

Note: MAX PV (m/min. * kg/sq. cm)
Frelon GOLD® = 430 PV
Frelon J = 215 PV

MAX PV (m/s. * N/mm^2)
Frelon GOLD = 0.70 PV
Frelon J = 0.35 PV

MAX Speed Running Dry (m/min.)
Frelon GOLD = 91.4
Frelon J = 42.6

MAX Speed Running Dry (m/s)
Frelon GOLD = 1.52
Frelon J = 0.71

MAX Speed Running with Lubrication (m/min.)
Frelon GOLD = 251.5
Frelon J = 122

MAX Speed Running with Lubrication (m/s)
Frelon GOLD = 4.19
Frelon J = 2.03

Only certified 60 Plus Shafting provides Maximum linear bearing performance.
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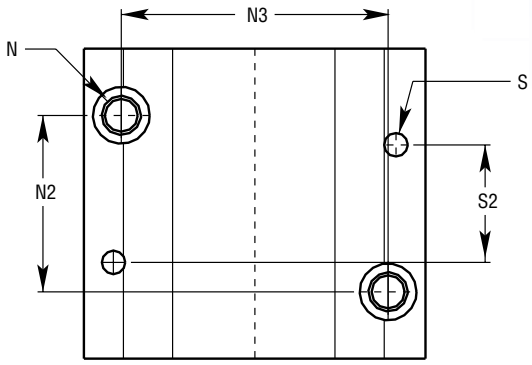
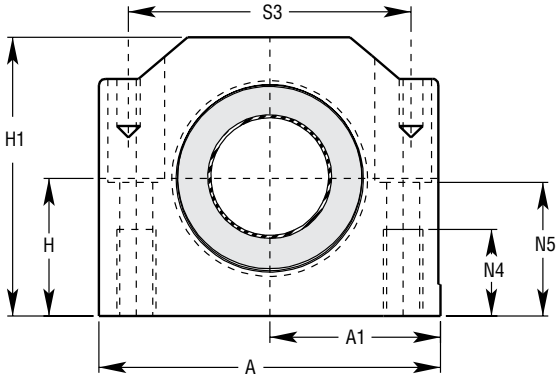
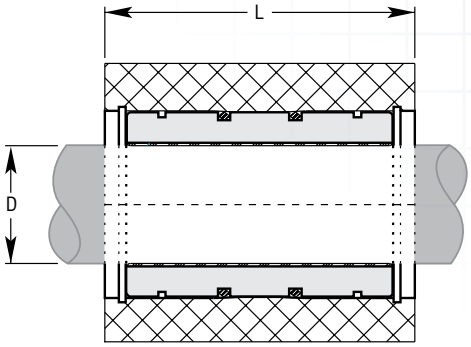
Simplicity® Closed Pillow Blocks

Plain Bearings – Closed Pillow Blocks PM







Configure

Dimensional Information

Part No.		D Nom. Brg. I.D.	H	H1	A	A1	L	N								MAX Static Load lbs.		MAX Static Load N		Assem. Wt.
Closed			Centerline													Frelon®		Frelon		
Precision	Compensated	mm	.015	Height	Width	.013	Length	Bolt	N2	N3	N4	N5	S	S2	S3	GOLD	J & W	GOLD	J & W	kg.
PM08	PM08C	8	15	28	35	17.5	32	M4 x 0.7	20.15	25.15	9	14.5	N/A	N/A	N/A	926	463	4120	2060	0.069
PM10	PM10C	10	16	31.5	40	20	36	M5 x 0.8	20.15	29.15	11	15	4	29	31	1345	672	5984	2992	0.095
PM12	PM12C	12	18	35	43	21.5	39	M5 x 0.8	23.15	32.15	11	16.5	4	32	34	1777	888	7907	3953	0.118
PM16	PM16C	16	22	42	53	26.5	43	M6 x 1.0	26.15	40.15	13	21	4	35	42	2667	1334	11870	5935	0.200
PM20	PM20C	20	25	50	59.3	30	54	M8 x 1.25	32.15	45.15	18	24	5	45	50	4167	2083	18541	9270	0.329
PM25	PM25C	25	30	60	78	39	67	M10 x 1.5	40.15	60.15	22	29	6	20	64	6715	3358	29881	14941	0.655
PM30	PM30C	30	35	71	87	43.5	79	M10 x 1.5	45.15	68.15	22	34	6	30	72	9444	4722	42026	21013	1.020
PM40	PM40C	40	45	91	108	54	91	M12 x 1.75	58.15	86.15	26	44	8	35	90	14814	7407	65923	32962	1.846
PM50	PM50C	50	50	105	132	66	113	M16 x 2.0	50.20	108.20	34	49	10	42	108	23147	11574	103005	51503	3.169

Notes: (1) Standard pillow block assembly includes self-aligning housing and precision bearing.
(2) All standard metric pillow blocks use standard FM series bearings.
(3) Straight bore pillow block assembly includes standard O.D. FM series bearing in straight bore housing.

Only certified 60 Plus Shafting provides Maximum linear bearing performance.
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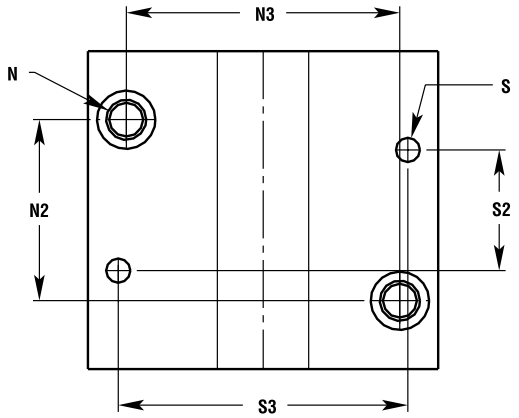
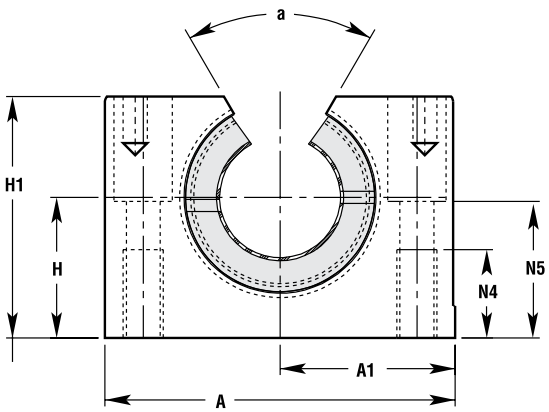
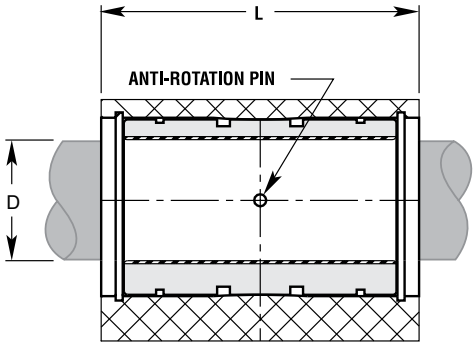
Simplicity® Open Pillow Blocks

Plain Bearings – Open Pillow Blocks PMN







Configure

Dimensional Information

Part No.		D Nom. Brg. I.D.	H	H1	A	A1	L	N								A	MAX Static Load lbs.		MAX Static Load N		Assem. Wt.
Open			Centerline														Frelon®		Frelon		
Precision	Compensated	MIN	.015	Height	Width	.013	Length	Bolt	N2	N3	N4	N5	S	S2	S3	mm	GOLD	J & W	GOLD	J & W	kg.
PMN12	PMN12C	12	18	28	43	21.5	39	M5 x 0.8	23.15	32.15	11	16.5	4	32	34	66	1777	888	7907	3953	0.096
PMN16	PMN16C	16	22	35	53	26.5	43	M6 x 1.0	26.15	40.15	13	21	4	35	42	68	2667	1334	11870	5935	0.162
PMN20	PMN20C	20	25	42	60	30	54	M8 x 1.25	32.15	45.15	18	24	5	45	50	60	4167	2083	18541	9270	0.267
PMN25	PMN25C	25	30	51	78	39	67	M10 x 1.5	40.15	60.15	20	29	6	20	64	60	6715	3358	29881	14941	0.536
PMN30	PMN30C	30	35	60	87	43.5	79	M10 x 1.5	45.15	68.15	22	34	6	30	72	60	9444	4722	42026	21013	0.831
PMN40	PMN40C	40	45	77	108	54	91	M12 x 1.75	58.15	86.15	26	44	8	35	90	60	14814	7407	65923	32962	1.499
PMN50	PMN50C	50	50	88	132	66	113	M16 x 2.0	50.20	108.20	34	49	10	42	108	60	23147	11574	103005	51503	2.539

Only certified 60 Plus Shafting provides Maximum linear bearing performance.

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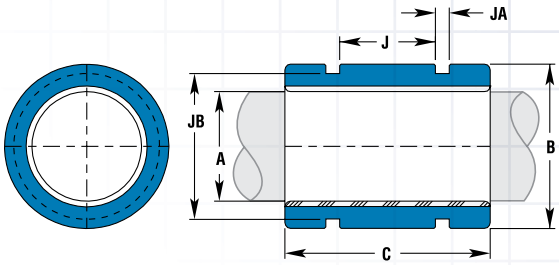
Simplicity® Thin Wall Bearings

Plain Bearings – Compact Thin Wall FG

Configure



Dimensional Information

Precision I.D. Series Similar to Preloaded Ball Bearing				Compensated I.D. Series Similar to Standard Ball Bearing			B O.D. h7		C Length		Concentric	Bearing Weight
Part No.	Nominal Size	A Bearing I.D. F8		Part No.	A Bearing I.D.							
Closed	mm	MIN	MAX	Closed	MIN	MAX	MIN	MAX	MIN	MAX	MAX mm	kg.
FG06	6	6.010	6.028	FGC 06	6.060	6.078	11.98	12	17.619	18	0.0254	0.004
FG08	8	8.013	8.035	FGC 08	8.063	8.085	14.98	15	19.619	20	0.0254	0.006
FG10	10	10.013	10.035	FGC 10	10.063	10.085	16.98	17	21.619	22	0.0254	0.008
FG12	12	12.016	12.043	FGC 12	12.066	12.093	21.98	22	26.619	27	0.0254	0.018
FG15	15	15.016	15.043	FGC 15	15.066	15.093	24.98	25	27.619	28	0.0254	0.022
FG16	16	16.016	16.043	FGC 16	16.066	16.093	25.98	26	29.619	30	0.0254	0.025
FG18	18	18.020	18.053	FGC 18	18.096	18.129	27.98	28	29.619	30	0.0254	0.027
FG20	20	20.020	20.053	FGC 20	20.096	20.129	31.98	32	34.619	35	0.0254	0.044
FG25	25	25.020	25.053	FGC 25	25.096	25.129	39.98	40	44.619	45	0.0254	0.091
FG30	30	30.020	30.053	FGC 30	30.096	30.129	44.98	45	53.619	54	0.0254	0.127
FG35	35	35.025	35.064	FGC 35	35.127	35.166	51.98	52	61.619	62	0.0254	0.189
FG40	40	40.025	40.064	FGC 40	40.127	40.166	59.98	60	71.619	72	0.0254	0.301
FG50	50	50.025	50.064	FGC 50	50.127	50.166	74.98	75	89.619	90	0.0254	0.596

Mounting Dimensions

Part No.		Nominal Size	J Between O-Ring GRVS.	JA O-Ring GRV. Width	JB O-Ring GRV. Dia.	O-Ring Size	O-Ring Part Number
Precision	Compensated						
FG06	FGC06	6	N/A	N/A	N/A	N/A	N/A
FG08	FGC08	8	8.0	2.032	12.201	12 x 1.7	6000025
FG10	FGC10	10	8.3	2.032	14.415	14 x 1.6	6000026
FG12	FGC12	12	12.0	3.175	17.907	17.5 x 2.5	6000016
FG15	FGC15	15	12.7	3.175	20.671	20 x 2.65	6000029
FG16	FGC16	16	12.7	3.175	21.882	21.5 x 2.5	6000017
FG18	FGC08	18	14.0	3.175	23.885	23.5 x 2.5	6000031
FG20	FGC20	20	17.0	3.175	27.864	27.5 x 2.5	6000018
FG25	FGC25	25	24.0	3.175	35.865	35.5 x 2.5	6000019
FG30	FGC30	30	30.0	3.175	40.895	40 x 2.5	6000034
FG35	FGC35	35	36.0	4.115	46.200	46 x 3.5	6000035
FG40	FGC40	40	37.3	4.115	54.255	53 x 3.5	6000036
FG50	FGC50	50	50	4.115	69.215	69 x 3.5	6000022

Load & Speed Data

Part No.	Effective Surface Area	MAX Static Load lbs. Frelon®		Effective Surface Area	MAX Static Load N Frelon	
	cm²	GOLD	J & W	cm²	GOLD	J & W
FG06	1.1	498	249	1.10	2217	1109
FG08	1.6	741	370	1.60	3296	1648
FG10	2.2	1018	509	2.20	4532	2266
FG12	3.2	1499	749	3.20	6671	3335
FG15	4.2	1944	972	4.20	8652	4326
FG16	4.8	2222	1111	4.80	9888	4944
FG18	5.4	2500	1250	5.40	11125	5562
FG20	7.0	3241	1620	7.00	14421	7210
FG25	11.3	5207	2604	11.30	23171	11586
FG30	16.2	7500	3750	16.20	33374	16687
FG35	21.7	10048	5024	21.70	44714	22357
FG40	28.8	13333	6666	28.80	59331	29665
FG50	45.0	20833	10416	45.00	92705	46352

Note: MAX PV (m/min. * kg/sq. cm)
Frelon GOLD® = 430 PV
Frelon J = 215 PV

MAX PV (m/s. * N/mm²)
Frelon GOLD = 0.70 PV
Frelon J = 0.35 PV

MAX Speed Running Dry (m/min.)
Frelon GOLD = 91.4
Frelon J = 42.6

MAX Speed Running Dry (m/s)
Frelon GOLD = 1.52
Frelon J = 0.71

MAX Speed Running with Lubrication (m/min.)
Frelon GOLD = 251.5
Frelon J = 122

MAX Speed Running with Lubrication (m/s)
Frelon GOLD = 4.19
Frelon J = 2.03

Only certified 60 Plus Shafting provides Maximum linear bearing performance.

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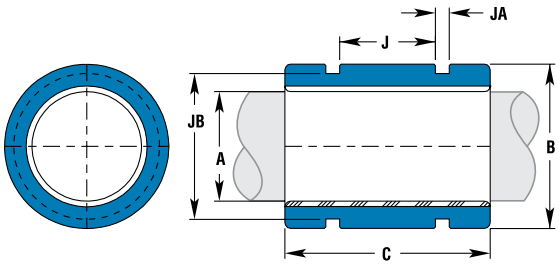
Simplicity® Thin Wall Bearings

Plain Bearings – Compact Thin Wall FMT

Configure



Dimensional Information

Precision I.D. Series Similar to Preloaded Ball Bearing				Compensated I.D. Series Similar to Standard Ball Bearing			B O.D. H7		C Length		Concentric	Bearing Weight
Part No.	Nominal Size	A Bearing I.D. F8		Part No.	A Bearing I.D.							
Closed	mm	MIN	MAX	Closed	MIN	MAX	MIN	MAX	MIN	MAX	MAX mm	kg.
FMT06	6	6.010	6.028	FMTC 06	6.060	6.078	11.982	12	21.619	22	0.0254	0.0057
FMT08	8	8.013	8.035	FMTC 08	8.063	8.085	14.982	15	23.619	24	0.0254	0.0071
FMT10	10	10.013	10.035	FMTC 10	10.063	10.085	16.982	17	25.619	26	0.0254	0.0085
FMT12	12	12.016	12.043	FMTC 12	12.066	12.093	18.979	19	27.619	28	0.0254	0.0113
FMT14	14	14.016	14.043	FMTC 14	14.066	14.093	20.979	21	27.619	28	0.0254	0.0128
FMT16	16	16.016	16.043	FMTC 16	16.066	16.093	23.979	24	29.619	30	0.0254	0.0184
FMT20	20	20.020	20.053	FMTC 20	20.096	20.129	27.979	28	29.619	30	0.0254	0.0227
FMT25	25	25.020	25.053	FMTC 25	25.096	25.129	34.975	35	39.619	40	0.0254	0.0439
FMT30	30	30.020	30.053	FMTC 30	30.096	30.129	39.975	40	49.619	50	0.0254	0.0652
FMT40	40	40.025	40.064	FMTC 40	40.127	40.166	51.970	52	59.619	60	0.0254	0.1233
FMT50	50	50.025	50.064	FMTC 50	50.127	50.166	61.970	62	69.619	70	0.0254	0.1772

Mounting Dimensions

Part No.		Nominal Size	J Between O-Ring GRVS.	JA O-Ring GRV. Width	JB O-Ring GRV. Dia.	O-Ring Size	O-Ring Part Number
Precision	Compensated						
FMT06	FMTC06	6	N/A	N/A	N/A	N/A	N/A
FMT08	FMTC08	8	10.0	2.000	12.200	12 x 1.7	6000025
FMT10	FMTC10	10	12.0	2.000	14.400	14 x 1.6	6000026
FMT12	FMTC12	12	14.0	2.000	16.600	16 x 1.5	6000027
FMT14	FMTC14	14	14.0	2.000	18.500	18 x 1.5	6000028
FMT16	FMTC16	16	14.0	2.000	21.300	21.1 x 1.6	6000030
FMT20	FMTC20	20	14.0	2.000	25.500	25 x 1.5	6000032
FMT25	FMTC25	25	22.0	3.200	30.900	30.5 x 2.5	6000033
FMT30	FMTC30	30	30.0	3.200	35.900	35.5 x 2.5	6000019
FMT40	FMTC40	40	40.0	4.100	46.200	46 x 3.5	6000035
FMT50	FMTC50	50	50.0	4.100	56.300	26 x 3.5	6000021

Load & Speed Data

Part No.	Effective Surface Area	MAX Static Load lbs. Frelon®		Effective Surface Area	MAX Static Load N Frelon	
	cm²	GOLD	J & W	cm²	GOLD	J & W
FMT06	0.202	613	307	1.3	2727	1364
FMT08	0.295	891	445	1.9	3963	1982
FMT10	0.403	1204	602	2.6	5356	2678
FMT12	0.527	1556	778	3.4	6926	3463
FMT14	0.605	1816	908	3.9	8083	4042
FMT16	0.744	2222	1111	4.8	9888	4944
FMT20	0.930	2778	1389	6.0	12361	6180
FMT25	1.550	4629	2315	10.0	20601	10301
FMT30	2.325	6944	3472	15.0	30902	15451
FMT40	3.720	11111	5555	24.0	49442	24721
FMT50	5.425	16203	8102	35.0	72104	36052

Note: MAX PV (m/min. * kg/sq. cm)
Frelon GOLD® = 430 PV
Frelon J = 215 PV

MAX Speed Running Dry (m/min.)
Frelon GOLD = 91.4
Frelon J = 42.6

MAX Speed Running with Lubrication (m/min.)
Frelon GOLD = 251.5
Frelon J = 122

MAX PV (m/s. * N/mm²)
Frelon GOLD = 0.70 PV
Frelon J = 0.35 PV

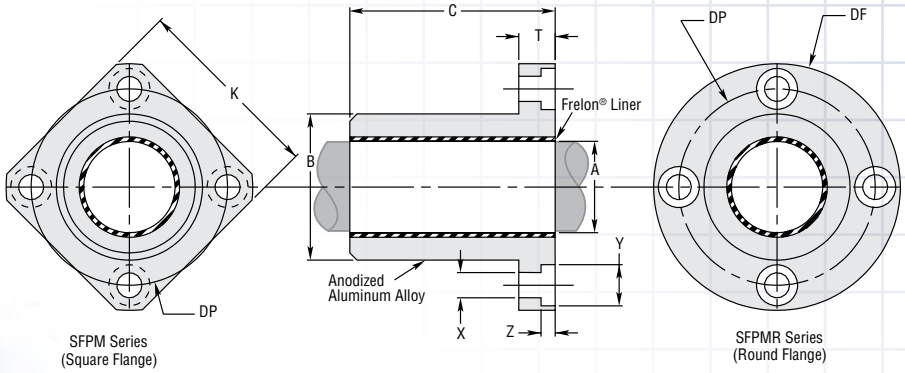
MAX Speed Running Dry (m/s)
Frelon GOLD = 1.52
Frelon J = 0.71

MAX Speed Running with Lubrication (m/s)
Frelon GOLD = 4.19
Frelon J = 2.03

Only certified 60 Plus Shafting provides Maximum linear bearing performance.
Inch Series–page 3 Metric Series–page 40

Simplicity® Flange Bearings

Flange Bearings SFPM



Dimensional Information

Precision I.D. Series Similar to Preloaded Ball Bearing				Compensated I.D. Series Similar to Standard Ball Bearing				Nominal Size	B Body O.D. h7		C Length h13		Effective Surface Area	MAX Static Load N	
Part No.		A Bearing I.D. F8		Part No.		A Bearing I.D.								Frelon®	
Square	Round	MIN	MAX	Square	Round	MIN	MAX	MM	MIN	MAX	MIN	MAX	cm²	GOLD	J & W
SFPM08	SFPMR08	8.013	8.035	SFPM 08C	SFPMR 08C	8.063	8.085	8	15.982	16	24.8	25	2.094	4316	2168
SFPM12	SFPMR12	12.016	12.043	SFPM 12C	SFPMR 12C	12.066	12.093	12	21.979	22	31.8	32	4.021	8280	4159
SFPM16	SFPMR16	16.016	16.043	SFPM 16C	SFPMR 16C	16.066	16.093	16	25.979	26	35.8	36	6.032	12429	6239
SFPM20	SFPMR20	20.020	20.053	SFPM 20C	SFPMR 20C	20.096	20.129	20	31.975	32	44.8	45	9.425	19414	9751
SFPM25	SFPMR25	25.020	25.053	SFPM 25C	SFPMR 25C	25.096	25.129	25	39.975	40	57.7	58	15.184	31284	15706
SFPM30	SFPMR30	30.020	30.053	SFPM 30C	SFPMR 30C	30.096	30.129	30	46.975	47	67.7	68	21.363	44008	22102
SFPM40	SFPMR40	40.025	40.064	SFPM 40C	SFPMR 40C	40.127	40.166	40	61.970	62	79.7	80	33.510	69033	34669
SFPM50	SFPMR50	50.025	50.064	SFPM 50C	SFPMR 50C	50.127	50.166	50	74.970	75	99.7	100	52.360	107871	54161
SFPM60	SFPMR60	60.030	60.076	SFPM 60C	SFPMR 60C	60.182	60.228	60	89.965	90	124.6	125	78.540	161796	81246
SFPM80	SFPMR80	80.030	80.076	SFPM 80C	SFPMR 80C	80.182	80.228	80	119.965	120	164.6	165	138.230	284765	142991

Notes: (1) Formula used for effective surface area is (pi * ID * L)/3.
(2) MAX static load is effective surface area times MAX load for Frelon GOLD®.
(3) - 210 kgf/cm2 is the rating for Frelon GOLD; 105.45 kgf/cm2 is the rating for Frelon J.

Configure

Mounting Dimensions

Part No.		K Square	Df O.D.	T Length	DP Bolt Circle	X Hole	Y C'bore Depth	Z C'bore Depth	Clamping Bolt	Concentricity	Squareness	Sfpm Weight	Sfpmr Weight
Square	Round	MAX	MAX	MAX								kg.	kg.
SFPM08	SFPMR08	25	32	8	24	3.5	6	3.1	M 3	0.012	0.012	0.018	0.022
SFPM12	SFPMR12	32	42	9	32	4.5	7.5	4.1	M 4	0.012	0.012	0.037	0.046
SFPM16	SFPMR16	35	46	9	36	4.5	7.5	4.1	M 4	0.012	0.012	0.047	0.058
SFPM20	SFPMR20	42	54	11	43	5.5	9	5.1	M 5	0.015	0.015	0.085	0.101
SFPM25	SFPMR25	50	62	11	51	5.5	9	5.1	M 5	0.015	0.015	0.156	0.172
SFPM30	SFPMR30	60	76	14	62	6.6	11	6.1	M 6	0.015	0.015	0.257	0.293
SFPM40	SFPMR40	75	98	18	80	9.0	14	8.1	M 8	0.017	0.017	0.500	0.595
SFPM50	SFPMR50	88	112	18	94	9.0	14	8.1	M 8	0.017	0.017	0.825	0.930
SFPM60	SFPMR60	106	134	24	112	11.0	17	11.1	M 10	0.020	0.020	1.506	1.697
SFPM80	SFPMR80	136	164	24	142	11.0	17	11.1	M 10	0.020	0.020	3.308	3.483

Only certified 60 Plus Shafting provides Maximum linear bearing performance.
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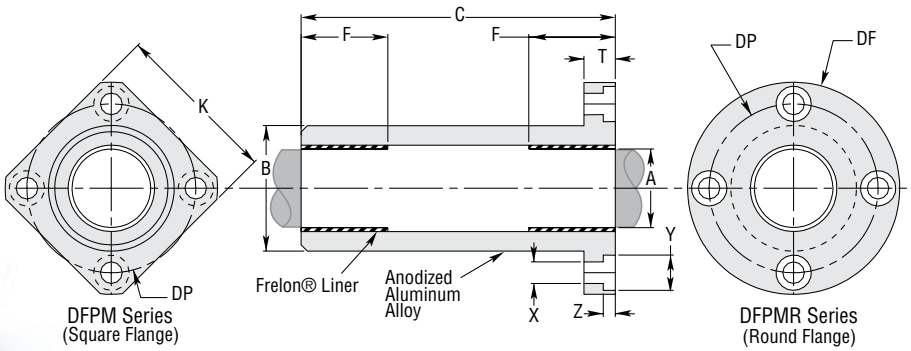
Simplicity® Flange Bearings

Flange Bearings DFPM



Dimensional Information

Precision I.D. Series Similar to Preloaded Ball Bearing				Compensated I.D. Series Similar to Standard Ball Bearing				Nominal Size	B Body O.D. h7		C Length		F Length Each End	Effective Surface Area	MAX Static Load N	
Part No.		A Bearing I.D. F8		Part No.		A Bearing I.D.									Frelon®	
Square	Round	MIN	MAX	Square	Round	MIN	MAX	mm	MIN	MAX	MIN	MAX		cm^2	GOLD	J & W
DFPM08	DFPMR08	8.013	8.035	DFPM 08C	DFPMR 08C	8.063	8.085	8	15.982	16	44.7	45	12.1	2.027	4179	2099
DFPM12	DFPMR12	12.016	12.043	DFPM 12C	DFPMR 12C	12.066	12.093	12	21.979	22	56.7	57	15.4	3.870	7976	4002
DFPM16	DFPMR16	16.016	16.043	DFPM 16C	DFPMR 16C	16.066	16.093	16	25.979	26	69.7	70	20.4	6.836	14087	7073
DFPM20	DFPMR20	20.020	20.053	DFPM 20C	DFPMR 20C	20.096	20.129	20	31.975	32	79.7	80	22.1	9.257	19071	9575
DFPM25	DFPMR25	25.020	25.053	DFPM 25C	DFPMR 25C	25.096	25.129	25	39.975	40	111.6	112	33.1	17.331	35708	17933
DFPM30	DFPMR30	30.020	30.053	DFPM 30C	DFPMR 30C	30.096	30.129	30	46.975	47	122.6	123	35	21.991	45303	22749
DFPM40	DFPMR40	40.025	40.064	DFPM 40C	DFPMR 40C	40.127	40.166	40	61.970	62	150.6	151	44	36.861	75939	38131
DFPM50	DFPMR50	50.025	50.064	DFPM 50C	DFPMR 50C	50.127	50.166	50	74.970	75	191.6	192	69.5	72.780	149936	75282
DFPM60	DFPMR60	60.030	60.076	DFPM 60C	DFPMR 60C	60.182	60.228	60	89.965	90	208.6	209	73	91.735	188980	94892

Notes: (1) Formula used for effective surface area is (pi * ID * L)/3.
(2) MAX static load is effective surface area times MAX load for Frelon GOLD®.
(3) - 210 kgf/cm^2 is the rating for Frelon GOLD®; 105.45 kgf/cm^2 is the rating for Frelon J.
(4) Frelon pads in each end (F dimension).

Configure

Mounting Dimensions

Part No.		K Square	DF O.D.	T Length	DP Bolt Circle	X Hole	Y C'Bore Depth	Z C'Bore Depth	Clamping Bolt	Concentricity	Squareness	DFPM Weight	DFPMR Weight
Square	Round	MAX	MAX	MAX								kg.	kg.
DFPM08	DFPMR08	25	32	8	24	3.5	6	3.1	M 3	0.015	0.015	0.027	0.031
DFPM12	DFPMR12	32	42	9	32	4.5	7.5	4.1	M 4	0.015	0.015	0.055	0.064
DFPM16	DFPMR16	35	46	9	36	4.5	7.5	4.1	M 4	0.015	0.015	0.078	0.089
DFPM20	DFPMR20	42	54	11	43	5.5	9	5.1	M 5	0.017	0.017	0.133	0.149
DFPM25	DFPMR25	50	62	11	51	5.5	9	5.1	M 5	0.017	0.017	0.270	0.286
DFPM30	DFPMR30	60	76	14	62	6.6	11	6.1	M 6	0.017	0.017	0.413	0.450
DFPM40	DFPMR40	75	98	18	80	9.0	14	8.1	M 8	0.020	0.020	0.846	0.942
DFPM50	DFPMR50	88	112	18	94	9.0	14	8.1	M 8	0.020	0.020	1.450	1.556
DFPM60	DFPMR60	106	134	24	112	11.0	17	11.1	M 10	0.025	0.025	2.329	2.519

Only certified 60 Plus Shafting provides Maximum linear bearing performance.
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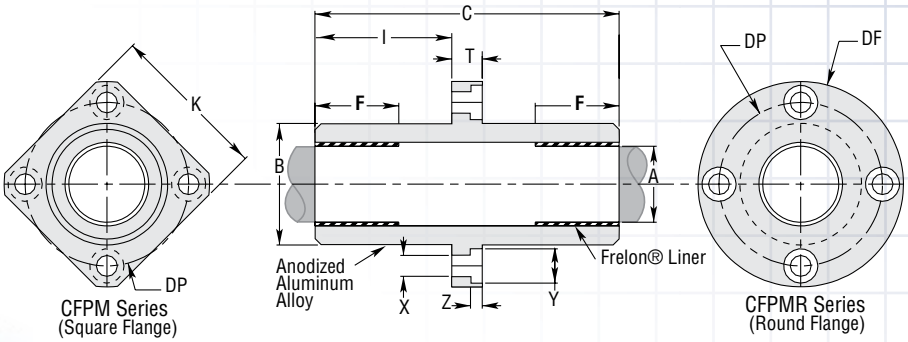
Simplicity® Flange Bearings

Flange Bearings CFPM



Dimensional Information

Precision I.D. Series Similar to Preloaded Ball Bearing				Compensated I.D. Series Similar to Standard Ball Bearing				Nominal Size	B Body O.D. h7		C Length		I Length To Flng.	F Length Each End	Effective Surface Area	MAX Static Load N	
Part No.		A Bearing I.D. F8		Part No.		A Bearing I.D.										Frelon®	
Square	Round	MIN	MAX	Square	Round	MIN	MAX	mm	MIN	MAX	MIN	MAX			cm²	GOLD	J & W
CFPM08	CFPMR08	8.013	8.035	CFPM 08C	CFPMR 08C	8.063	8.085	8	15.982	16	45.7	46.3	19.0	12.1	2.027	4179	2099
CFPM12	CFPMR12	12.016	12.043	CFPM 12C	CFPMR 12C	12.066	12.093	12	21.979	22	60.7	61.3	26.0	15.4	3.870	7976	4002
CFPM16	CFPMR16	16.016	16.043	CFPM 16C	CFPMR 16C	16.066	16.093	16	25.979	26	67.7	68.3	29.5	20.4	6.836	14087	7073
CFPM20	CFPMR20	20.020	20.053	CFPM 20C	CFPMR 20C	20.096	20.129	20	31.975	32	79.7	80.3	34.5	22.1	9.257	19071	9575
CFPM25	CFPMR25	25.020	25.053	CFPM 25C	CFPMR 25C	25.096	25.129	25	39.975	40	111.7	112.3	50.5	33.1	17.331	35708	17933
CFPM30	CFPMR30	30.020	30.053	CFPM 30C	CFPMR 30C	30.096	30.129	30	46.975	47	122.7	123.3	54.5	35	21.991	45303	22749
CFPM40	CFPMR40	40.025	40.064	CFPM 40C	CFPMR 40C	40.127	40.166	40	61.970	62	150.7	151.3	66.5	44	36.861	75939	38131
CFPM50	CFPMR50	50.025	50.064	CFPM 50C	CFPMR 50C	50.127	50.166	50	74.970	75	191.7	192.3	87.0	69.5	72.780	149936	75282
CFPM60	CFPMR60	60.030	60.076	CFPM 60C	CFPMR 60C	60.182	60.228	60	89.965	90	208.7	209.3	92.5	73	91.735	188980	94892

Notes: (1) Formula used for effective surface area is (pi * ID * L)/3.
(2) MAX static load is effective surface area times MAX load for Frelon GOLD®.
(3) - 210 kgf/cm² is the rating for Frelon GOLD®; 105.45 kgf/cm² is the rating for Frelon J.
(4) Frelon pads in each end (F dimension).

Configure

Mounting Dimensions

Part No.		K Square	DF O.D.	T Length	DP Bolt Circle	X Hole	Y C'Bore Depth	Z C'Bore Depth	Clamping Bolt	Concentricity	Squareness	CFPM Weight	CFPMR Weight
Square	Round	MAX	MAX	MAX								kg.	kg.
CFPM08	CFPMR08	25	32	8	24	3.5	6	3.1	M 3	0.015	0.015	0.027	0.031
CFPM12	CFPMR12	32	42	9	32	4.5	7.5	4.1	M 4	0.015	0.015	0.058	0.067
CFPM16	CFPMR16	35	46	9	36	4.5	7.5	4.1	M 4	0.015	0.015	0.077	0.088
CFPM20	CFPMR20	42	54	11	43	5.5	9	5.1	M 5	0.017	0.017	0.133	0.149
CFPM25	CFPMR25	50	62	11	51	5.5	9	5.1	M 5	0.017	0.017	0.270	0.286
CFPM30	CFPMR30	60	76	14	62	6.6	11	6.1	M 6	0.017	0.017	0.413	0.450
CFPM40	CFPMR40	75	98	18	80	9.0	14	8.1	M 8	0.020	0.020	0.846	0.942
CFPM50	CFPMR50	88	112	18	94	9.0	14	8.1	M 8	0.020	0.020	1.450	1.556
CFPM60	CFPMR60	106	134	24	112	11.0	17	11.1	M 10	0.025	0.025	2.329	2.519

Only certified 60 Plus Shafting provides Maximum linear bearing performance.
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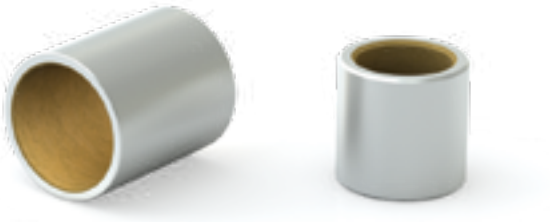
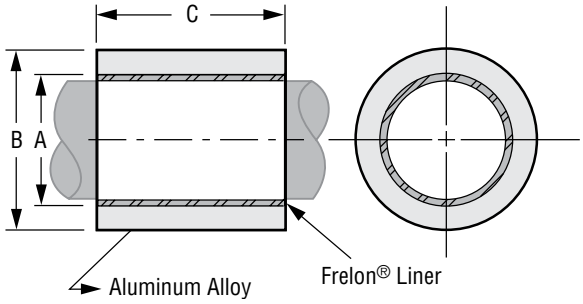
Simplicity® Sleeve Bearings

Sleeve Bearings PSM



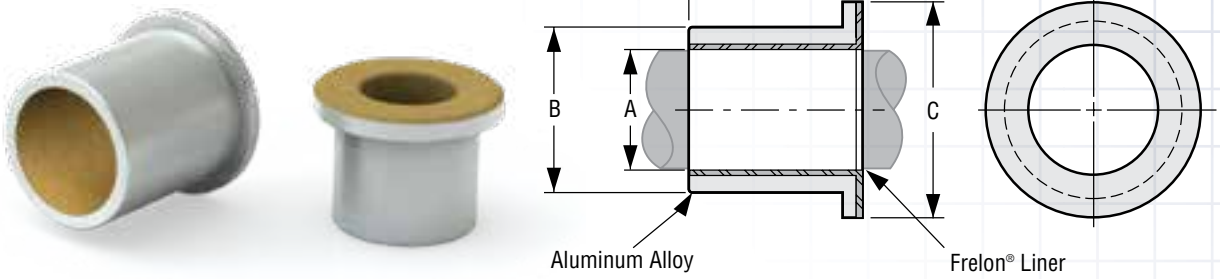


Dimensional Information

Part No.	Nominal Bearing Size			A Bearing I.D.		B O.D. S7		C Length		MAX Static Load Kg.		MAX Static Load N		Bearing Weight	Recommended Housing Bore			
										Frelon®		Frelon			Slip Fit & Epoxy		Press Fit	
	I.D.	O.D..	LENGTH	MIN	MAX	MIN	MAX	MIN	MAX	GOLD	J & W	GOLD	J & W	kg	MIN	MAX	MIN	MAX
PSM0610-06	6	10	6	6.028	6.058	10.023	10.038	5.75	6	76	38	745	373	0.00084	10.038	10.063	10.000	10.015
PSM0610-10	6	10	10	6.028	6.058	10.023	10.038	9.75	10	126	63	1236	618	0.00140	10.038	10.063	10.000	10.015
PSM0812-08	8	12	8	8.033	8.066	12.028	12.046	7.75	8	134	67	1314	657	0.00140	12.046	12.071	12.000	12.018
PSM0812-12	8	12	12	8.033	8.066	12.028	12.046	11.75	12	202	101	1981	990	0.00210	12.046	12.071	12.000	12.018
PSM0814-08	8	14	8	8.033	8.066	14.028	14.046	7.75	8	134	67	1314	657	0.00231	14.046	14.071	14.000	14.018
PSM0814-12	8	14	12	8.033	8.066	14.028	14.046	11.75	12	202	101	1981	990	0.00347	14.046	14.071	14.000	14.018
PSM1014-10	10	14	10	10.033	10.066	14.028	14.046	9.75	10	210	105	2059	1030	0.00210	14.046	14.071	14.000	14.018
PSM1014-16	10	14	16	10.033	10.066	14.028	14.046	15.75	16	336	168	3295	1647	0.00336	14.046	14.071	14.000	14.018
PSM1216-12	12	16	12	12.034	12.070	16.028	16.046	11.75	12	302	151	2961	1481	0.00294	16.046	16.071	16.000	16.018
PSM1216-16	12	16	16	12.034	12.070	16.028	16.046	15.75	16	404	202	3962	1981	0.00392	16.046	16.071	16.000	16.018
PSM1519-16	15	19	16	15.034	15.070	19.035	19.056	15.75	16	504	252	4942	2471	0.00476	19.046	19.071	19.000	19.018
PSM1620-12	16	20	12	16.041	16.080	20.035	20.056	11.50	12	404	202	3962	1981	0.00378	20.056	20.081	20.000	20.021
PSM1620-16	16	20	16	16.041	16.080	20.035	20.056	15.50	16	538	269	5276	2638	0.00505	20.056	20.081	20.000	20.021
PSM1620-25	16	20	25	16.041	16.080	20.035	20.056	24.50	25	840	420	8237	4119	0.00788	20.056	20.081	20.000	20.021
PSM2025-16	20	25	16	20.042	20.084	25.034	25.057	15.50	16	672	336	6590	3295	0.00787	20.056	25.081	25.000	25.021
PSM2025-20	20	25	20	20.042	20.084	25.034	25.057	19.50	20	840	420	8237	4119	0.00984	20.056	25.081	25.000	25.021
PSM2025-25	20	25	25	20.042	20.084	25.034	25.057	24.50	25	1050	525	10296	5148	0.01230	20.056	25.081	25.000	25.021
PSM2025-30	20	25	30	20.042	20.084	25.034	25.057	29.50	30	1260	630	12356	6178	0.01476	20.056	25.081	25.000	25.021
PSM2530-20	25	30	20	25.050	25.096	30.035	30.056	19.50	20	1050	525	10296	5148	0.01202	30.056	30.081	30.000	30.021
PSM2530-25	25	30	25	25.050	25.096	30.035	30.056	24.50	25	1312	656	12865	6433	0.01503	30.056	30.081	30.000	30.021
PSM2530-30	25	30	30	25.050	25.096	30.035	30.056	29.50	30	1576	788	15454	7727	0.01803	30.056	30.081	30.000	30.021
PSM2535-25	25	35	25	25.050	25.096	35.043	35.068	24.50	25	1312	656	12865	6433	0.03276	35.068	35.093	35.000	30.021
PSM2535-35	25	35	35	25.050	25.096	35.043	35.068	34.50	35	1838	919	18023	9012	0.04586	35.068	35.093	35.000	30.021
PSM3035-25	30	35	25	30.050	30.096	35.043	35.068	24.50	25	1576	788	15454	7727	0.01777	35.068	35.093	35.000	30.021
PSM3035-30	30	35	30	30.050	30.096	35.043	35.068	29.50	30	1890	945	18533	9267	0.02133	35.068	35.093	35.000	30.021
PSM3040-35	30	40	35	30.050	30.096	40.043	40.068	34.50	35	2206	1103	21632	10816	0.05349	40.068	40.093	40.000	40.025
PSM3040-50	30	40	50	30.050	30.096	40.043	40.068	49.50	50	3150	1575	30889	15444	0.07641	40.068	40.093	40.000	40.025
PSM3545-25	35	45	25	35.052	35.102	45.041	45.067	24.50	25	1838	919	18023	9012	0.04365	45.068	45.093	45.000	45.025
PSM3545-40	35	45	40	35.052	35.102	45.041	45.067	39.50	40	2940	1470	28830	14415	0.06983	45.068	45.093	45.000	45.025
PSM3545-50	35	45	50	35.052	35.102	45.041	45.067	49.50	50	3676	1838	36047	18023	0.08729	45.068	45.093	45.000	45.025
PSM4050-30	40	50	30	40.052	40.102	50.043	50.068	29.50	30	2520	1260	24711	12356	0.05891	50.068	50.093	50.000	50.025
PSM4050-40	40	50	40	40.052	40.102	50.043	50.068	39.50	40	3360	1680	32948	16474	0.07855	50.068	50.093	50.000	50.025
PSM5060-35	50	60	35	50.062	50.133	60.053	60.099	34.50	35	3676	1838	36047	18023	0.08419	60.099	60.124	60.000	60.030
PSM5060-50	50	60	50	50.062	50.133	60.053	60.099	49.50	50	5250	2625	51482	25741	0.12027	60.099	60.124	60.000	60.030
PSM6070-60	60	70	60	60.063	60.139	70.053	70.099	59.50	60	7560	3780	74133	37067	0.17052	70.099	70.124	70.000	70.030

Simplicity® Sleeve Bearings with Flange

Sleeve Bearings With Flange PSFM



Dimensional Information

Part No.	Nominal Bearing Size Mm			A Bearing I.D.		B O.D. S7		C Flange O.D.	D Flange Width	L Length		MAX Static Load Kg. Frelon®		MAX Static Load N Frelon		Bearing Weight	Recommended Housing Bore Slip Fit & Epoxy		Recommended Housing Bore Press Fit	
	I.D.	O.D.	LENGTH	MIN	MAX	MIN	MAX			MIN	MAX	GOLD	J & W	GOLD	J & W	kg	MIN	MAX	MIN	MAX
PSFM0610-06	6	10	6	6.028	6.058	10.023	10.038	14	2	5.75	6	76	38	745	373	0.00126	10.038	10.063	10.000	10.015
PSFM0610-10	6	10	10	6.028	6.058	10.023	10.038	14	2	9.75	10	126	63	1236	618	0.00182	10.038	10.063	10.000	10.015
PSFM0812-06	8	12	6	8.033	8.066	12.028	12.046	16	2	5.75	6	100	50	981	490	0.00153	12.046	12.071	12.000	12.018
PSFM0812-08	8	12	8	8.033	8.066	12.028	12.046	16	2	7.75	8	134	67	1314	657	0.00189	12.046	12.071	12.000	12.018
PSFM0812-12	8	12	12	8.033	8.066	12.028	12.046	16	2	11.75	12	202	101	1981	990	0.00259	12.046	12.071	12.000	12.018
PSFM1016-08	10	16	8	10.033	10.066	16.028	16.046	22	3	7.75	8	168	84	1647	824	0.00421	16.046	16.071	16.000	16.018
PSFM1016-10	10	16	10	10.033	10.066	16.028	16.046	22	3	9.75	10	210	105	2059	1030	0.00489	16.046	16.071	16.000	16.018
PSFM1016-16	10	16	16	10.033	10.066	16.028	16.046	22	3	15.75	16	336	168	3295	1647	0.00694	16.046	16.071	16.000	16.018
PSFM1218-08	12	18	8	12.034	12.070	18.028	18.046	24	3	7.75	8	202	101	1981	990	0.00478	18.046	18.071	18.000	18.018
PSFM1218-12	12	18	12	12.034	12.070	18.028	18.046	24	3	11.75	12	302	151	2961	1481	0.00636	18.046	18.071	18.000	18.018
PSFM1519-16	15	19	16	15.034	15.070	19.028	19.046	25	3	15.50	16	504	252	4942	2471	0.00647	19.046	19.071	19.000	19.018
PSFM1620-16	16	20	16	16.041	16.080	20.035	20.056	27	3	15.55	16	538	269	5276	2638	0.00718	20.056	20.081	20.000	20.021
PSFM1620-20	16	20	20	16.041	16.080	20.035	20.056	27	3	19.50	20	672	336	6590	3295	0.00844	20.056	20.081	20.000	20.021
PSFM1620-25	16	20	25	16.041	16.080	20.035	20.056	27	3	24.50	25	840	420	8237	4119	0.01002	20.056	20.081	20.000	20.021
PSFM2026-20	20	26	20	20.042	20.084	26.035	26.056	32	3	19.50	20	840	420	8237	4119	0.01432	26.056	26.081	26.000	26.021
PSFM2026-30	20	26	30	20.042	20.084	26.035	26.056	32	3	29.50	30	1260	630	12356	6178	0.02035	26.056	26.081	26.000	26.021
PSFM2530-20	25	30	20	25.042	25.084	30.035	30.056	39	3.5	19.50	20	1050	525	10296	5148	0.01672	30.056	30.081	30.000	30.021
PSFM2530-25	25	30	25	25.042	25.084	30.035	30.056	39	3.5	24.50	25	1312	656	12865	6433	0.01973	30.056	30.081	30.000	30.021
PSFM2530-32	25	30	32	25.042	25.084	30.035	30.056	39	3.5	31.50	32	1680	840	16474	8237	0.02394	30.056	30.081	30.000	30.021
PSFM3038-30	30	38	30	30.050	30.096	38.043	38.068	46	4	29.50	30	1890	945	18533	9267	0.04145	38.068	38.093	38.000	38.021
PSFM3545-35	35	45	35	35.052	35.102	45.043	45.068	55	5	34.50	35	2572	1286	25221	12611	0.07192	45.068	45.093	45.000	45.025
PSFM4050-40	40	50	40	40.052	40.102	50.043	50.068	60	5	39.50	40	3360	1680	32948	16474	0.09044	50.068	50.093	50.000	50.025
PSFM5060-50	50	60	50	50.062	50.133	60.053	60.099	70	5	49.50	50	5250	2625	51482	25741	0.13429	60.099	60.124	60.000	60.030

Ordering Information

PSM	16	20	-	16

Type	I.D.	O.D.	Length
PSM: Precision Sleeve Bearing	I.D. in mm	O.D. in mm	Length in mm
PSFM: Precision Sleeve Bearing with Flange	I.D. in mm	O.D. in mm	Length in mm

Note: Lengths not listed above must be specially quoted.

Only certified 60 Plus Shafting provides Maximum linear bearing performance.

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- **Installation Instructions**
- 1. Slip the bearing sleeve into the housing and epoxy into place with Loctite® or similar type bonding agent.

CAUTION *Do NOT let any of the adhesive touch the bearing liner. It will harden and interfere with the running clearance.*

- 2. Freeze the bearings at 0°F (-17.75°C) for 30-45 minutes. Using gloves, remove the bearings from the freezer and slip them into the housing. As they heat to room temperature, full contact between the bearing and housing will be achieved. The greatest advantage to this technique over traditional pressing is greater accuracy in alignment.

Technical Section

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TECHNICAL

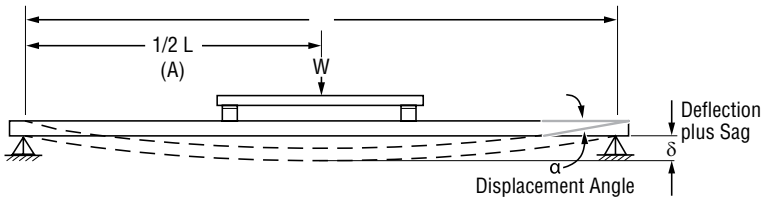
Email an Application Engineer

Shaft Deflection

Single point Shaft deflection

In applications where a support rail is not used, shaft deflection can become critical in the function of the bearing. If deflection is greater than the misalignment capabilities of a standard pillow block, binding can occur. Solutions would be to increase shaft and bearing size (to lessen the amount of deflection) or to use an open bearing configuration with a support rail. Follow the formulas below to check shaft deflection and sag.

Deflection at Center



FORMULA FOR INCH AND METRIC SHAFTING DEFLECTION

Total shaft deflection in horizontal applications:

Total Deflection (δ)= Def + Sag

Deflection = w x L^3 / D

Sag = L^4 / S

Deflection = Pure deflection due to load at center of shaft (in. or mm)

Sag = Deflection of shaft due to its own weight (in. or mm)

L = Shaft unsupported length (in. or mm)

W = load being applied at center of shaft (lbs. or N)

D = Deflection coefficient (D = 48 • E x I)

S = Sag coefficient (S = E • I • 384 / (5 • sw))

a = Displacement angle

Notes: I = π • $diam^4$ / 64
sw = π • $diam^2$ / 4 • density
E = Modulus of Elasticity (Young's modulus)

Total Deflection

ø1 in. Shaft
24 in. Length (L)
250 lbs. load (W)

$$\text{Deflection} = \frac{W \bullet L^3}{D \text{ (from table)}}$$

$$= \frac{250 \text{ lbs.} \bullet (24 \text{ in.})^3}{6.83 \bullet 10^7}$$

$$= \frac{3{,}456{,}000 \text{ in}^3 \text{ lbs.}}{68{,}300{,}000 \text{ in}^2 \text{ lbs.}}$$

$$\text{Deflection} = 0.0506 \text{ in.}$$

$$\text{SAG} = \frac{L^4}{S \text{ (from table)}}$$

$$= \frac{(24)^4}{4.92 \bullet 10^8}$$

$$\text{SAG} = \frac{331{,}776 \text{ in}^4}{492{,}000{,}000 \text{ in}^3}$$

$$\text{SAG} = .000674 \text{ in.}$$

Total Deflection (δ) = Deflection + SAG
= 0.0506 in. + .000674 in.
Total Deflection (δ) = 0.0513 in.

Inch Shafting

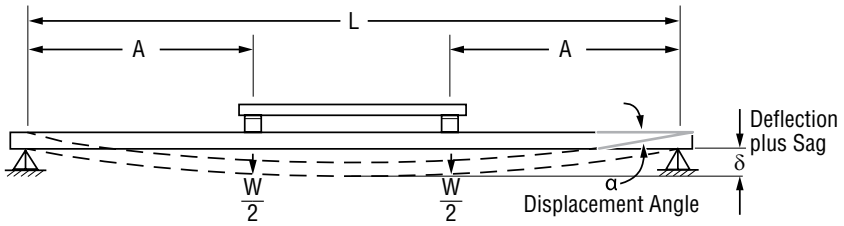
Shaft Diameter	Hardened Steel		Stainless Steel		Ceramic Coated Aluminum Shaft	
	D	S	D	S	D	S
3/16"	8.4 x 10^4	1.7 x 10^7	8.0 x 10^4	1.6 x 10^7	2.9 x 10^4	1.65E+05
1/4"	2.67 x 10^5	3.1 x 10^7	2.54 x 10^5	2.9 x 10^7	9.2 x 10^4	2.93E+05
3/8"	1.35 x 10^6	6.9 x 10^7	1.29 x 10^6	6.5 x 10^7	4.7 x 10^5	6.58E+05
1/2"	4.27 x 10^6	1.23 x 10^8	4.06 x 10^6	1.16 x 10^8	1.5 x 10^6	1.17E+06
5/8"	1.04 x 10^7	1.92 x 10^8	9.92 x 10^6	1.81 x 10^8	3.6 x 10^6	1.83E+06
3/4"	2.16 x 10^7	2.77 x 10^8	2.06 x 10^7	2.61 x 10^8	7.5 x 10^6	2.63E+06
1"	6.83 x 10^7	4.92 x 10^8	6.5 x 10^7	4.63 x 10^8	2.4 x10^7	4.68E+06
1-1/4"	1.67 x 10^8	7.69 x 10^8	1.59 x 10^8	7.24 x 10^8	5.8 x 10^7	7.31E+06
1-1/2"	3.46 x 10^8	1.11 x 10^9	3.29 x 10^8	1.04 x 10^9	1.22 x 10^8	1.05E+07
2"	1.09 x 10^9	1.97 x 10^9	1.04 x 10^9	1.85 x 10^9	3.8 x 10^8	1.87E+07
2-1/2"	2.67 x 10^9	3.07 x 10^9	2.54 x 10^9	2.9 x 10^9	N/A	N/A
3"	5.53 x 10^9	4.43 x 10^9	5.27 x 10^9	4.17 x 10^9	N/A	N/A
4"	1.75 x 10^{10}	7.87 x 10^9	1.66 x 10^{10}	7.41 x 10^9	N/A	N/A

Metric Shafting

Shaft Diameter	Hardened Steel		Stainless Steel	
	D	S	D	S
5 mm	2.94 x 10^8	3.12 x 10^{11}	2.8 x 10^8	2.94 x 10^{11}
6 mm	6.11 x 10^8	4.5 x 10^{11}	5.81 x 10^8	4.24 x 10^{11}
8 mm	1.93 x 10^9	8.0 x 10^{11}	1.84 x 10^9	7.53 x 10^{11}
10 mm	4.71 x 10^9	1.25 x 10^{12}	4.48 x 10^9	1.18 x 10^{12}
12 mm	9.77 x 10^9	1.8 x 10^{12}	9.3 x 10^9	1.69 x 10^{12}
13 mm	1.35 x 10^{10}	2.11 x 10^{12}	1.28 x 10^{11}	1.99 x 10^{12}
14 mm	1.81 x 10^{10}	2.45 x 10^{12}	1.72 x 10^{11}	2.31 x 10^{12}
16 mm	3.09 x 10^{10}	3.2 x 10^{12}	2.94 x 10^{11}	3.01 x 10^{12}
20 mm	7.54 x 10^{10}	5.0 x 10^{12}	7.17 x 10^{11}	4.71 x 10^{12}
25 mm	1.84 x 10^{11}	7.81 x 10^{12}	1.75 x 10^{11}	7.35 x 10^{12}
30 mm	3.82 x 10^{11}	1.12 x 10^{13}	3.63 x 10^{11}	1.06 x 10^{13}
35 mm	7.07 x 10^{11}	1.53 x 10^{13}	6.73 x 10^{11}	1.44 x 10^{13}
38 mm	9.82 x 10^{11}	1.8 x 10^{13}	9.35 x 10^{11}	1.7 x 10^{13}

Shaft Deflection

DUAL point Shaft deflection



$$\delta = \frac{WA(3L^2-4A^2)}{48\ EI} + \frac{5SL^4}{384\ EI}$$

δ	=	Deflection
L	=	Distance between the shaft support (in.)
E	=	Modulus of elasticity (lbf/in.^{2}) (30 • 10^6)
I	=	Shaft moment of inertia (in.^{4})
S	=	Unit weight of shaft; reference the table below
W	=	Load applied (including carriage weight) (lbf)
A	=	Distance to end (in.)
a	=	Displacement angle

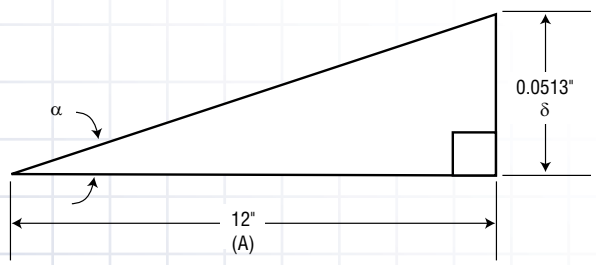
Inch Shafting

Steel Shaft		
Shaft Diameter	**EI (lbf/in.^{2})**	**S (lbf/in.)**
1/4"	5.75 x 10^3	0.014
3/8"	2.91 x 10^4	0.031
1/2"	9.20 x 10^4	0.055
5/8"	2.25 x 10^5	0.086
3/4"	4.66 x 10^5	0.125
7/8"	8.63 x 10^5	0.170
1"	1.47 x 10^6	0.222
1-1/8"	2.36 x 10^6	0.281
1-1/4"	3.60 x 10^6	0.348
1-3/8"	5.26 x 10^6	0.420
1-1/2"	7.46 x 10^6	0.500
1-3/4"	1.38 x 10^7	0.681
2"	2.36 x 10^7	0.890
3"	1.19 x 10^8	2.003

Metric Shafting

Steel Shaft		
Shaft Diameter	**EI**	**S**
8	1.45 x 10^4	0.022
12	7.34 x 10^4	0.050
16	2.32 x 10^5	0.088
20	5.66 x 10^5	0.138
25	1.38 x 10^6	0.216
30	2.87 x 10^6	0.311
40	9.06 x 10^6	0.552
50	2.21 x 10^7	0.863

Displacement Angle (values calculated on previous page)



$$\pm = \tan^{-1}\frac{\delta}{A}$$

$$\pm = \tan^{-1}\frac{0.0513\ \text{in.}}{12\ \text{in.}}$$

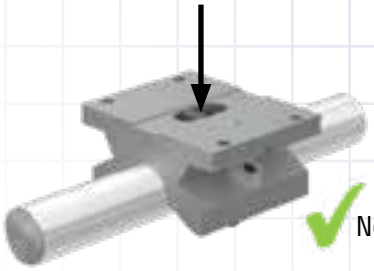
± =0.2449° Displacement Angle

0.2449° < 1/2° Allowable = Good Design

Technical Information

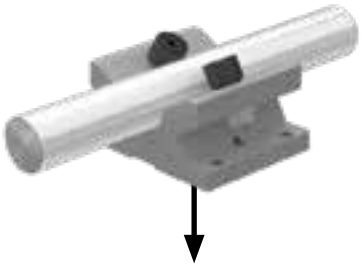
Orientation and Cantilever Loads

When a linear motion system is subjected to a cantilever load or moment, the system designer must take into consideration these type of loads will greatly effect the performance of the system. Roller pillow blocks are not suitable for these types of applications because the moments will load the side rollers and cause premature failure. If the moments or cantilever loads are minor, loads may be acceptable. For this reason we ask that you consult the factory.

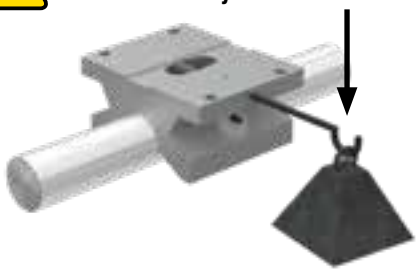


Normal Loading

Inverted Load



Moment Load
Consult Factory



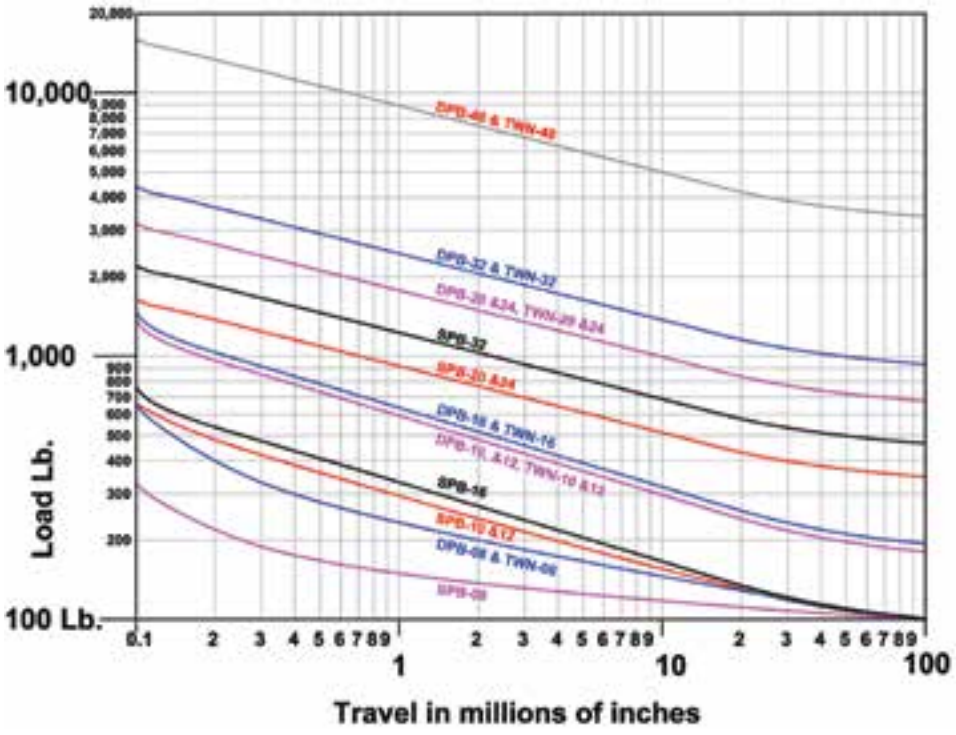
Vertical Load
Consult Factory

Consult Factory • 800-221-0811

Determining Pillow Block Size and Model

To determine the proper size roller pillow block for an application, refer to the chart using the worst-case load and the required travel life. Select the roller pillow block above where the lines intersect. This should be suitable for anticipated travel life and loading.

Note: Shock, vibration, and moments may effect the life of the pillow block.



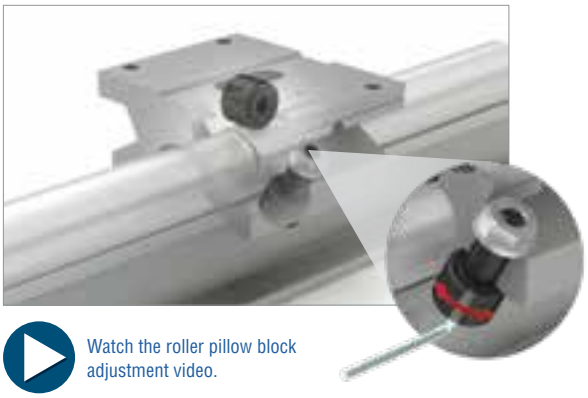
Note: Chart is rated at 10% accuracy. Figures are based on a safety factor of one.

Technical Information

Adjustments

Roller pillow blocks are factory set for LEE Linear 60 Plus® shafting. Adjustments can be made to the eccentric cam follower to either increase or decrease the shaft clearance.

Located on the same side of the roller pillow block as the set screw, the eccentric cam follower is adjusted by using a stubby allen wrench while allowing a 0.001" feeler gauge to freely move between the shaft and the eccentric roller. The fixed side must remain in contact with the shaft. If care is taken not to overload the roller, then a slight pre-load is possible. Rollers should never be tightened to the point where they cannot move freely.



Watch the roller pillow block adjustment video.

Turning a Curve

A single roller pillow block has the ability to turn a curve or run on a non-linear system. The following table lists the minimum track radius that the single roller pillow block can tolerate without additional alteration.

Pillow Block Size		8	10	12	16	20	24	32	48	64
Minimum Shaft Radius	in.	6	12	14	18	36	40	44	52	60

Linear Ball Bearings Technical Information

Load Rating and Life Expectancy

The life (L) of a linear ball bearing can be obtained from the following equation with the basic dynamic load rating and the load applied to the bearing:

$$L = \left(\frac{f_H \cdot f_T \cdot f_C}{f_W} \cdot \frac{C}{p}\right)^3 \cdot 50 \quad \text{———(1)}$$

- **L:** Rated life (km)
- **C:** Basic dynamic load rating (N/lbf)
- **P:** Working load (N/lbf)
- **fw:** Load coefficient
- **fH:** Hardness factor
- **fT:** Temperature coefficient
- **fc:** Contact coefficient

The lifespan (Lh) of a linear ball bearing in hours can be obtained by calculating the traveling distance per unit time. The lifespan can be obtained from the following equation if the stroke length and the number of strokes are constant:

$$L_h = \left(\frac{L \cdot 10^3}{2 \cdot s \cdot n_1 \cdot 60}\right) \quad \text{———————} \quad (2)$$

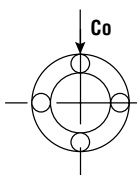
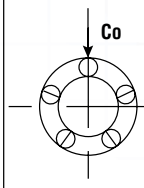
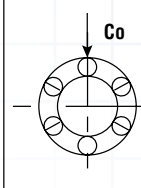
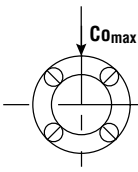
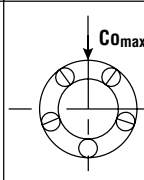
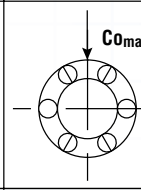
- **Lh:** Lifespan (hr)
- **L:** Rated life (km)
- **s:** Stroke length (m)
- **n1:** Number of strokes per minute (cpm)
- **50:** Constant base line (km)

Relation Between Ball Circuits and Load Rating

Linear ball bearings are constructed so that the ball circuits are spaced equally. The load rating varies according to the loaded position. The load ratings of the linear ball bearings from the dimensional tables are per track and increased loading can be achieved by equally sharing the load between the tracks.

The table shows the increased value by the number of ball circuits in such cases.

Notes: (1) 3 track bearing is equal.
(2) Open bearing load is de-rated by 50% if going against the opening.

Number of Rows	4	5	6
Co Load Rating Specified on the Tables			
Co_{max} MAX Load Rating			
Load Ratio Co_{max}/Co	1.414	1.463	1.280

Sample Calculations

1. Obtaining the rated life L and lifespan L_H of the Simplicity® linear ball bearing used in the following conditions:

- Linear ball bearing EP20G
- Stroke length50 mm
- Number of strokes per minute 50 cpm
- Load per bush 490 N
- The basic dynamic load rating of the linear ball bearing is 882 N from the dimension tables. From equation (1), therefore, the rated life L is obtained as follows:

$$L = \left(\frac{f_H \cdot f_T \cdot f_C}{f_W} \cdot \frac{C}{p}\right)^3 \cdot 50 \quad F_H=F_T=F_C=F_W=1.0$$

$$= \left(\frac{882}{490}\right)^3 \cdot 50 = 292 \text{ km}$$

From equation (2), the lifespan Lh is obtained as follows:

$$L_h = \frac{L \cdot 10^3}{2 \cdot \ell_S \cdot n_1 \cdot 60} = \frac{292 \cdot 10^3}{2 \cdot 0.05 \cdot 50 \cdot 60} = 973 \text{ hr}$$

2. Select the ball bearing type by satisfying the following conditions:

- Number of linear bushing used 4
- Stroke length ..... 1 m
- Traveling speed ..... 10 m/min.
- Number of strokes per minute ..... 5 cpm
- Lifespan ..... 10,000 hr
- Total load ..... 980 N

From equation (2), the traveling distance within the lifespan is obtained as follows:

$$L = 2 \cdot \ell_S \cdot n_1 \cdot 60 \cdot L_h = 6{,}000 \text{ km}$$

From equation (1), the basic dynamic load rating is obtained as follows:

$$C = \sqrt[3]{\frac{L}{50}} \cdot \left(\frac{f_W}{f_H \cdot f_T \cdot f_C}\right) \cdot P = 1492N$$

Assume the following with a pair of shafts each with two linear ball bearings: $f_C = 0.81\ f_W = f_T = f_H = 1$

As a result, EP20G is selected from the dimension table as the Simplicity® linear ball bearing type satisfying the value of C.

Load Rating & Rating Life Linear Ball Bearings

Load Rating

Basic Dynamic Load Rating (C) –

This term is arrived at based on an evaluation of a number of identical linear systems individually run in the same conditions, if 90% of them can run with the load (with a constant value in a constant direction) for a distance of 50 km without damage caused by rolling fatigue. This is the basis of the rating.

Allowable Static Moment (M) –

This term defines the allowable limit value of static moment load, with reference to the amount of permanent deformation similar to that used for evaluation of basic rated load (Co).

Static Safety Factor (fs) –

This factor is used based on the application condition.

Static Safety Factors Table 1

Condition of use	Low Limit of fs
When the shaft has less deflection and shock	1 to 2
When elastic deformation should be considered with respect to cantilever load	2 to 4
When the equipment is subject to vibration and impacts	3 to 5

Basic Static Load Rating (Co) –

This term defines a static load such that, at the contacting position where the Maximum stress is exercised, the sum of the permanent deformation of the rolling elements and that of the rolling plain is 0.0001 times of the diameter of the rolling elements.

Rating Life

Rating Life of the Linear System

As long as the linear system reciprocates while being loaded, continuous stress can cause flaking on the rolling bodies and planes due to material fatigue. The system's distance of travel until the first flaking occurs is called the life of the system. The life of the system varies even when similar conditions are used – dimensions, structure, material, heat treatment, and processing method. The material fatigue causes the essential variations. The rating life defined bellow is used as an index for the life expectancy of the linear system.

Rating Life (L)

Rating life is the total travelling distance that 90% of a group of systems of the same size can reach without causing any flaking when they operate under the same conditions. The rating life can be obtained from the following equation with the basic dynamic load rating and the load on the linear system:

$$L = \left(\frac{C}{p}\right)^3 \cdot 50 \quad \text{——————} \quad (1)$$

For ball type:

L: Rating life (km)

C: Basic dynamic load rating (N)

p: Load (N)

Consideration and influence of vibration impact loads and distribution of load should be taken into account when designing a linear motion system. It is difficult to calculate the actual load. The rating life is also affected by the operating temperature. In these conditions, the expression (1) is arranged as follows:

For ball type:

$$L = \left(\frac{f_H \cdot f_T \cdot f_C}{f_W} \cdot \frac{C}{p}\right)^3 \cdot 50$$

L: Rating life (km)

fh: Hardness factor (See Fig.1)

C: Basic dynamic load rating (N)

fr: Temperature coefficient (See Fig.2)

p: Load (N)

fc: Contact coefficient (See Table 2)

fw: Load coefficient (See Table 3)

The rating life in hours can be calculated by obtaining the travelling distance per unit time. The rating life in hours can be obtained from the following expression when the stroke length and the number of strokes are constant:

$$L_h = \left(\frac{L \cdot 10^3}{2\ell_s \cdot n_1 \cdot 60}\right)$$

Lh : Rating life in hours (hr)

ℓ_s : Stroke length (m)

L : Rating life (km)

n_1 : No. of strokes per minute (cpm)

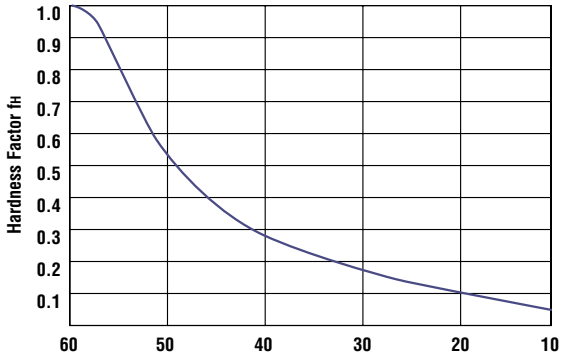
Rating Life Linear Ball Bearings

Rating Life

Hardness Factor (fH)

The shaft must be sufficiently hardened when a linear bushing is used. If not properly hardened, permissible load is lowered and the life of the linear ball bearings will be shortened.

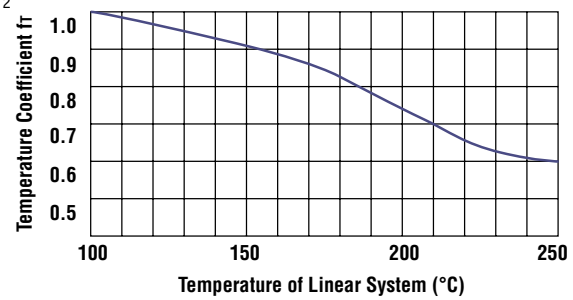
FIG. 1



Temperature Coefficient (fT)

If the temperature of the linear system exceeds 100°C, hardness of the linear system and the shaft lowers to decrease the permissible load compared to that of the linear system used at room temperature. As a result, the abnormal temperature rise shortens the rating life.

FIG. 2



Notes: Maximum temperature of plastic retainer 212°F or 100°C.
Maximum temperature 176° per Table 6 on page 134.

Contact Coefficient (fc) – Table 2

Generally two or more linear bearings are used on one shaft. Thus, the load on each linear system differs depending on each processing accuracy. Because the linear bushings are not loaded equally, the number of linear bushings per shaft changes the permissible load off the system.

Contact Coefficient Table 2

Number of Linear Systems per Shaft	Contact Coefficient fc
1	1.00
2	0.81
3	0.72
4	0.66
5	0.61

Load Coefficient (fw) – Table 3

When calculating the load on the linear system, it is necessary to accurately obtain object weight, inertial force based on motion speed, moment load, and each transition as time passes. However, it is difficult to calculate those values accurately because reciprocating motion involves the repetition of start and stop as well as vibration and impact. A more practical approach is to obtain the load coefficient by taking the actual operating conditions into account.

Load Coefficient Table 3

Operating Conditions	fw
Operation at low speed (15 m/min. or less) without impulsive shock from outside	1.0 to 1.5
Operation at intermediate speed (60 m/min. or less)without impulsive shock	1.5 to 2.0
Operation at high speed (over 60 m/min.) with impulsive shock from outside	2.0 to 3.5

Frictional Resistance

The static frictional resistance of the Simplicity® linear system is so low that it is only slightly different from the kinetic frictional resistance, enabling smooth linear movement from low to high speeds. In general, the frictional resistance is expressed by the following equation.

$F = \mu \bullet W + f$

F : Frictional resistance μ : Coefficient of friction

W : Load weight f : Sealing resistance

The frictional resistance of each LEE Linear system depends on the model, load weight, speed, and lubricant. The sealing resistance depends on the lip interference and lubricant, regardless of the load weight. The sealing resistance of one linear system is about 200 to 500 gf. The coefficient of friction depends on the load weight, moment load, and preload.

Coefficient of Linear System Friction (μ) Table 5

Linear System Type	Models	Coefficient of Friction (μ)
Linear Bearing	JP, EP, IP	0.002 to 0.003

Ambient Working Temperature

The ambient working temperature range for each LEE linear system depends on the model. Consult LEE on use outside the recommended temperature range.

Temperature conversion equation:

$$C = \frac{5}{9}(F - 32) \qquad F = 32 + \frac{9}{5}C$$

Ambient Working Temperature Table 6

Linear System Type	Models	Ambient working temperature
Linear Ball Bearing	JP, EP, IP	-20 to 80°C, -4 to 176°F

Lubrication and Dust Prevention

Using LEE Linear systems without lubrication increases the abrasion of the rolling elements, shortening the life span. Systems, therefore, require appropriate lubrication. LEE Linear ball bearings are shipped with an anti-corrosion treatment, which must be cleaned prior to applying grease or oil. For lubrication, LEE Linear recommends turbine oil conforming to ISO Standards G32 to G68 or lithium base soap grease No.2. Prior to usage, apply lubricant directly inside the linear bearing and shaft, and re-lubricate periodically according to the operating conditions. Some systems from LEE Linear are sealed to block dust out and seal lubricant in. If used in a harsh or corrosive environment a protective cover should be used.

Clearance & Mounting Linear Ball Bearings

Clearance and Fit

Standard-type Simplicity® linear ball bearings matched to a shaft that provides inadequate clearance may result in early bearing failure and/or rough linear motion. The clearance adjustable linear ball bearings and open linear ball bearings can be adjusted when assembled in the housing by controlling the housing bore. However, too much clearance will increase the deformation of the linear ball bearing, which will affect its precision and life. Therefore, the appropriate clearance between the ball bearing and shaft, and the appropriate linear ball bearing housing bore are required based on application.

RECOMMENDED FIT OF LINEAR BALL BEARINGS

Model	Division	Shaft		Housing	
		Normal Fit	Transitional	Loose Fit	Tight Fit
JP	High Precision	g6	h6	H7	J7
IP	High Precision	g6	h6	H7	J7
EP	High Precision	h6	j6	H7	J7

Shaft and Housing

To optimize performance of the Simplicity® linear ball bearing it is recommended that a high precision shaft and pillow block are required.

Shaft

The rolling balls in linear ball bearings are in-line contact with the shaft surface. Therefore, the shaft dimensions, tolerance, surface finish, and hardness greatly affect the performance of the linear ball bearing. The shaft should be manufactured to the following tolerances:

1. Surface finish critically affects the smooth rolling of balls; shaft surface finish should be Ra 8-10.
2. Shaft hardness should be HRC 60 to 64. Hardness less than HRC 60 will decreases the life/load.
3. Preload increases the frictional resistance slightly. If the preload is too tight, the deformation of the bearing sleeve will shorten the linear ball bearing's life.

Housing

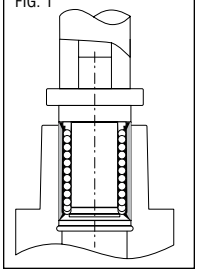
There are a wide variety of housings differing in design, machining, and mounting. See mounting requirements below.

Mounting

When inserting the linear ball bearing into the housing, do not hit the linear ball bearing on the end-retaining ring, but apply pressure either by hand or arbor on the linear ball bearing sleeve (See Fig.1) To insert the shaft into the mounted linear ball bearing, make sure the shaft is chamfered and be careful not to push on the balls by inserting the shaft at an angle.

Note: If two shafts are used in parallel, the parallelism is an important factor to assure smooth linear movement and not damage the linear ball bearings.

FIG. 1



Examples of Mounting

The popular way to mount linear ball bearings is with a slight preload. LEE Linear recommends a slight clearance fit-up to ensure proper life. The examples, Figs. 2 to 6, show the inserted linear ball bearing using a variety of retention methods.

FIG. 2

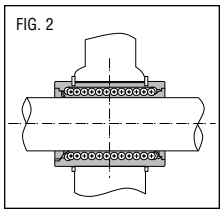


FIG. 3

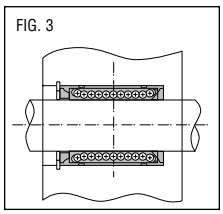


FIG. 4

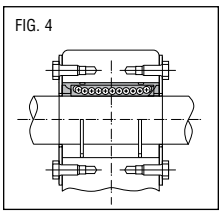


FIG. 5

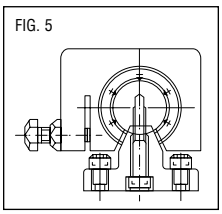
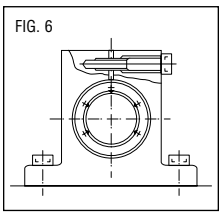


FIG. 6



Ratings Simplicity® Plain Bearings

Classes of Plain Bearings

Simplicity bearings are in a class of bearings known as Plain bearings, which means that they have no rolling elements. There are three classes of Plain bearings:

- **Class I** – Require an outside source of lubrication (oil, grease, etc.).
- **Class II** – Lubrication is impregnated within the walls of the bearing. (Bronze, powder metal, etc.) Typically, these bearings require an added lubricant also.
- **Class III** – Self-lubricating bearings, which do not require added lubricants.
- Simplicity bearings are Class III Plain bearings and are self-lubricating.

Rating a Plain Bearing

Plain bearing performance capacity is rated by PV.

P = Pressure or load in pounds per square inch (psi) or kilograms per square centimeter (kg/cm²).

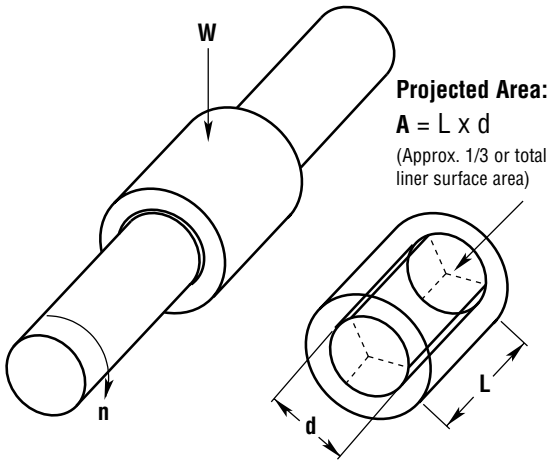
V = Velocity or surface speed in feet per minute (fpm or sfm) or meters per minute (m/min.).

PV = Pressure velocity value (Pressure x Velocity).

Simplicity Maximum Parameters

Maximum Parameters	P	V Running Dry	PV
Frelon® J	1500 psi or 105.45 kgf/cm²	140 sfm or 42.67 m/min.	10,000 psi x ft./min. or 215 kgf/cm² x m/min.
Frelon GOLD®	3000 psi or 210.9 kgf/cm²	300 sfm or 91.44 m/min.	20,000 psi x ft./min. or 430 kgf/cm² x m/min.

Note: All three parameters must be met by an application for the bearing to perform properly.



Projected Area:
A = L x d
(Approx. 1/3 or total liner surface area)

- **W** = MAX load
- **L** = bearing length
- **d** = shaft diameter
- **A** = projected contact area
- **n** = rotational speed (rpm)

Formulas for Ratings

Pressure is over the projected area of load:

- **A** = L • d

$$\mathbf{P} = \frac{W}{A} \text{ psi (or kg/cm}^2\text{)}$$

- **Velocity:**

Linear = total distance traveled in one minute

Rotational Velocity:

$$\mathbf{V} = \frac{\pi \bullet d \bullet n}{12} \text{ fpm (or m/min.)}$$

Pressure velocity value (PV):

PV = P • V psi • fpm (or kg/cm² • m/min.)

PV Equivalents

	inch	Technical Metric	Int'l Metric (si)
LOAD	1 psi	.0703 kgf/cm²	.0069 N/mm²
VELOCITY	1 ft./min.	.3048 m/min.	.00508 m/sec.
PV	1 PV	.0214 PV	.000036 PV
Frelon GOLD MAX PV	20,000	430	.72
Frelon J MAX PV	10,000	215	.36

Types & Effects of Lubrication Simplicity® Plain Bearings

Types and Effects of Lubrication

Lubrication is any outside technique used for reducing the friction, wear, or both of a bearing. **Proper lubrication of Simplicity bearings is critical.** Evaluate lubrication needs on an application-by-application basis to determine whether or not it should be used at all, what type is needed, and how it is applied. Below are some criteria on which to base the lubricant decision:

Do not use WD40™, PTFE sprays, or other oils, greases, or sprays that contain fluorocarbons or silicone. In testing, these lubricants have proven to cause long-term stick-slip problems with the Frelon lined bearings. They tend to become a gummy substance that ultimately increases friction.

WD40™ is a registered trademark of the WD40 Corporation.

- **Recommended Lubricants:**
- Waylube oils
- Lightweight oils
- 3-in-1 type oils
- Lightweight petroleum based greases

Using Oils with Simplicity

DO NOT USE ANY TYPE OF MOTOR OIL OR OILS WITH ADDITIVES! These types of oils work well short term, but quickly become ineffective, and will cause stick-slip reactions in the bearing. As a rule of thumb, the less additives in the oil, the better the performance. Recommended oils are Mobil Vactra #2 (a way lube oil) and any standard 3-in-1 oil. The 3-in-1 oils are tremendous cleaning oils and are the best in preparing for a proper transfer of teflon to the shafting.

Grease Products

DO NOT USE A MOLY FILLED OR OTHER TYPE FILLED GREASES! They become like a lapping compound on the ID of the bearing and increase wear dramatically.

Proper Use of Greases

Proper use of grease is critical for trouble-free operation.

Be sure the felt wick is removed from a “FL-xx-JKM” bearing because grease inserted through the zerk will cause the wick to act like a brake.

Do not fill all of the running clearance with grease! The temptation is to treat it like a rolling element bearing and fill it until it weeps from the end. This will cause greater friction and binding.

- The rule of thumb for the bearing liner that “thin is better” applies to the use of grease also.
- If grease is used and does not work in the application, it is possible to salvage the bearing with minimal work and to continue to operate. Follow the steps below:
- 1. If possible, remove the bearing from the housing, wipe the grease from the liner, use a 3-in-1 type oil to clean the excess remaining grease, and reinstall.
- 2. If it is not possible to remove the bearing, wipe as much grease as possible away from the ends of the bearing, then start to fill with a 3-in-1 type oil for cleaning the liner. To speed the cleaning process, apply forced air to the bearing through the zerk hole and continue using oil lubrication.

Effects of Lubrication

Lubrication can greatly increase the performance of a bearing when applied properly as noted earlier. Actual performance results for specific applications are difficult to predict due to the number of elements involved (temperature change with lube, useable life, or aging of lubricant, etc.). Specific application testing is recommended to establish specific performance parameters.

Load Capacity Simplicity® Plain Bearings

Load Capacity (Pressure)

Depending upon the material used, a plain bearing's load capacity can greatly exceed a rolling element bearing. There are three basic reasons for this:

- 1. The area of surface contact with the shaft is far greater than rolling element bearings, which have point-to-point contact with a given number of balls.
- 2. A rolling element bearing must be oriented properly for the ball tracks to carry the load adequately, while a Plain bearing can be mounted in any orientation.
- 3. Only one or two of the tracks in a rolling element bearing will actually carry any of the load applied.

Simplicity bearings have a thin liner that is bonded to a metal shell at the molecular level, allowing the load to be transferred throughout the bearing. This gives it an advantage over other Plain bearings of solid plastic or polymer materials. These other materials will tend to "cold flow" under pressure. "Cold flow" means to deform or lose shape. The idea is similar to pressing your finger into a bar of soap – material will move or deform as pressure is applied.

Linear Surface Speeds (Velocity)

In typical applications, speed is a known quantity and easily converted. Typically feet per minute or meters per minute are used. The most important factor that speed (along with friction) produces is heat buildup. This is not a critical factor in most linear applications because the heat is dissipated over the length of travel, and it does not affect the bearing. Short stroke or extremely high speed applications may see the effects of heat buildup in thermal expansion and the bearing ID locking on the shaft. A compensated ID bearing (FLC) is recommended in these applications.

Factors that Contribute to Wear Life

Plain bearings are rated by the wear rate of the bearing material. Wear is greatly dependent upon the proper application of the bearing and material used.

- Proper mating of shaft and liner materials.
- Surface finish 8-16 Ra (.20-.40 mm) is required. Peaks in the surface that are polished to a radius provide the best running surface. Sharp peaks in the finish will be like a fine lapping compound wearing the I.D. of the bearing.

Note: Shafting damaged by use with ball bearings can be salvaged and used with Simplicity bearings. Spin in a lathe and polish with sand papers in this order: 120 grit, 180 grit, and 300 grit. This will also remove sharp peaks in the surface finish.

- **Surface speed** - at high speeds, heat buildup will affect liner wear.
- **Break-in transfer** - proper transfer process of the liner to the shaft.
- **Lubrication** - proper lubrication can greatly improve the wear rate of a bearing. At the same time, improper lubrication can increase wear and failure.
- **Load & Wear Relationship** - wear rate is proportional to load to the third power: wear rate x $(load)^3$.

If load is reduced to ½, wear will be reduced to $(½)^3$.

- **Contamination** - while migrating into the bearing and embedding into the liner, certain types of contamination may, over time, cause increased wear to the liner.

Note: This is not an all inclusive list. There are many more factors within an application that can affect wear to different degrees. These are the major issues and the first things to address in a design.

Wear Rate Simplicity® Plain Bearings

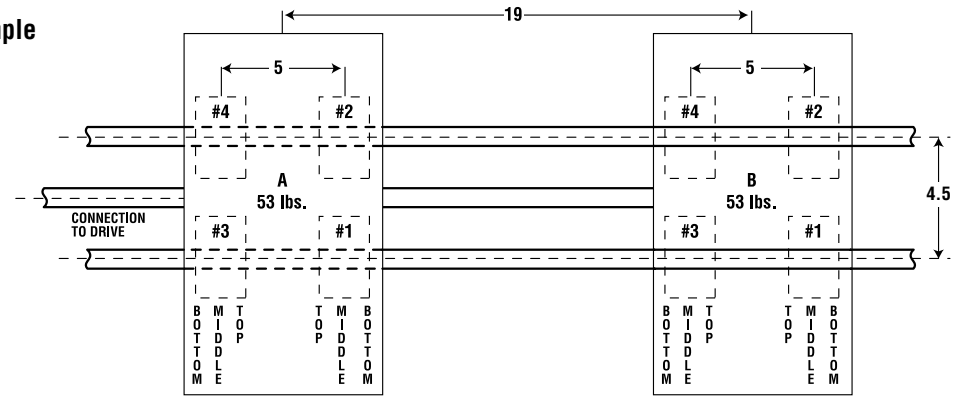
Wear Rate vs. Life Expectancy

A rolling element linear bearing's life expectancy is usually expressed in total inches or meters. A rolling element rotary bearing's life expectancy is expressed in hours of operation. Both are also rated for average (L-50) and minimum (L-10) life. L-50 life is the average life that can be expected from 50% of rolling element bearings. In other words, 50% will not reach the average life expectancy. L-10 life is the minimum life (1/5 the average life) expected from 90% of rolling element bearings. In other words, 10% will not reach the minimum life expectancy. Theoretically they could fail upon installation.

Plain bearings are not rated by a life expectancy but by the wear rate of the bearing material. Wear is greatly dependent upon the proper application of the bearing and material used.If it is not properly applied, it will fail. Failure, however, is subjective and dependent upon specific application requirements. 0.002" running clearance may not be acceptable in one application while another may be able to run a bearing until the liner is completely worn through. The user may then rotate it 30 degrees and continue to run it. This broad range of acceptability makes it difficult to determine life expectancy.

The first step is to determine what wear is acceptable for your application. Then utilizing the test data below, you can estimate the wear expected for your given application.

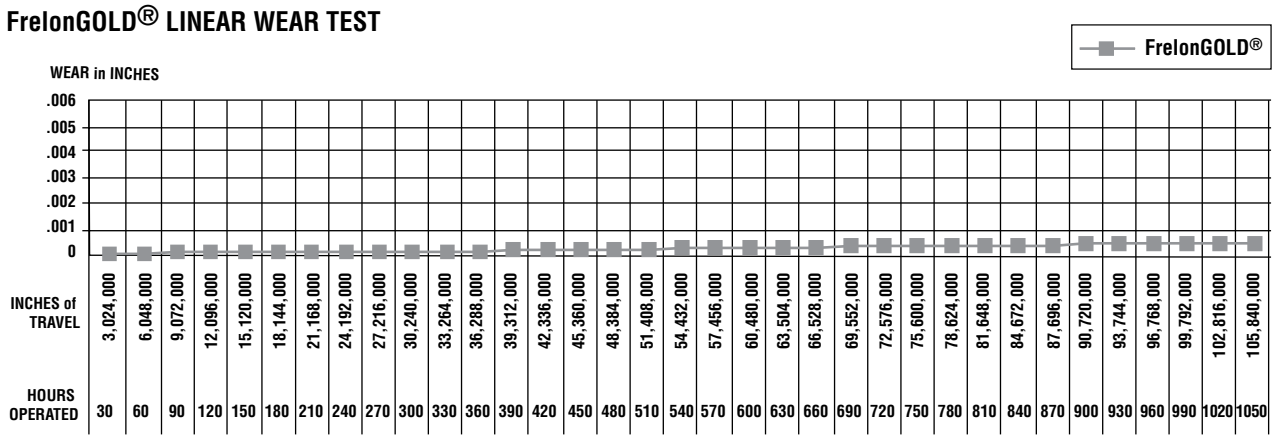
Wear Test Sample



- **CONDUCTED BY:** Pacific Bearing® Company
- **BEARING MATERIAL:** Frelon GOLD®
- **SHAFT MATERIAL:** Standard RC60 steel shafting
- **SURFACE FINISH:** 8-12 Ra
- **SPEED:** 140 fpm (70 cycles/min.; 1,680"/min.; 100,800"/hour; 2,419,200"/day)
- **STROKE:** 12"
- **LOAD:** 10.87 psi (53 lbs.)
- **BEARINGS USED:** FLN12 (3/4" open style bearings)
- **LUBRICATION:** None
- **TOTAL WEAR TO BEARING MATERIAL:** Frelon GOLD® = .00042"

Note: Wear is an average of totals taken from 4 bearings per carriage.

FrelonGOLD® LINEAR WEAR TEST



TECHNICAL Plain Bearing

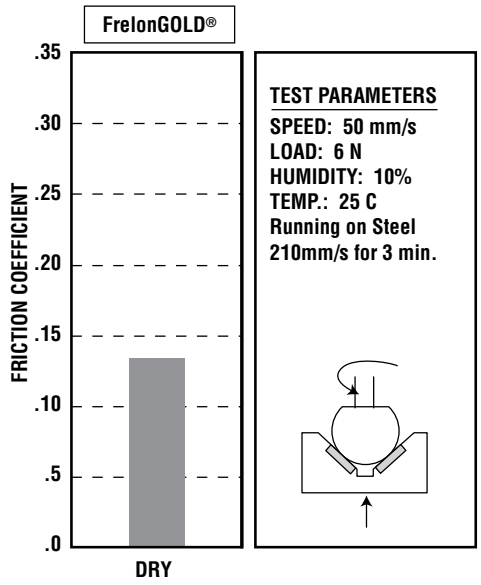
Coefficient of Friction Simplicity® Plain Bearings

Coefficient of Friction

A frequent misconception of Plain bearings is that wear and friction are basically synonymous, in that, high friction equals high wear or that low friction equals low wear. While there can be a relation between the two, they should be addressed as separate issues in the design process.

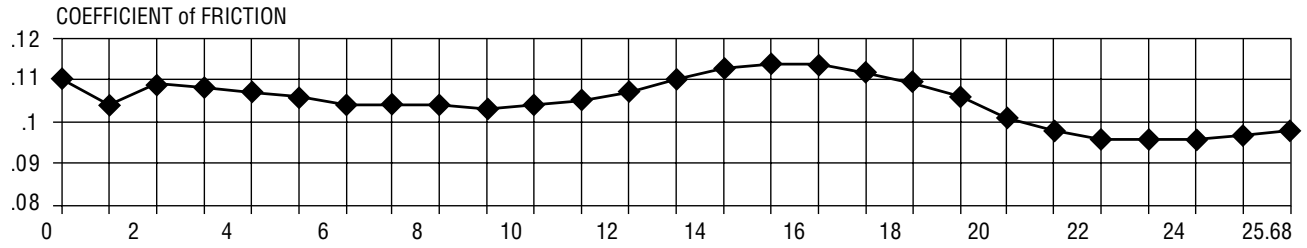
For example, dry running virgin (unfilled) Teflon® on steel's coefficient of friction (c.o.f.) is approximately .1 while filled Teflon's c.o.f. can range from .125 to .4 depending on the fillers used. By comparison, however, the virgin Teflon will wear at a much greater rate.

Friction Test Sample #1



- **CONDUCTED BY:** Dr. Tillwich GmbH
- **MANAGING DIRECTOR:** Mr. Werner Stehr (World leading tribologist with a seat on the ISOTC123 Committee establishing standards for tribological testing)
- **BEARING MATERIAL:** Frelon GOLD®
- **SHAFT MATERIAL:** Standard RC60 steel shafting
- **SURFACE FINISH:** 8-12 Ra
- **SPEED:** 50 mm/sec.
- **LOAD:** 6 N
- **TEMPERATURE:** 25° C
- **LUBRICATION:** None
- **AVERAGE COEFFICIENT OF FRICTION:** Frelon GOLD = .125

Friction Test Sample #2



- **CONDUCTED BY:** Frelon GOLD material processor
- **BEARING MATERIAL:** Frelon GOLD
- **SHAFT MATERIAL:** CRS 1018
- **SPEED:** 100 fpm
- **LOAD:** 100 psi
- **DURATION:** 25.68 hours
- **LUBRICATION:** None
- **SURFACE FINISH:** 8 Ra
- **AVERAGE COF:** 0.10
- **MAX COF:** 0.15
- **MIN COF:** 0.08
- **AVERAGE RUNNING TEMPERATURE:** 95.40° F

Cantilevered Loads Simplicity® Plain Bearings

Cantilevered Loads

- Maximum 2:1 ratio
- 1x = bearing separation on same shaft
- 2x = distance from shaft to load or force

Example: If 2x equals 10" then 1x must be at least 5"

CAUTION *Binding will occur if the 2:1 ratio is exceeded!!*

This principle is NOT load dependent. It is NOT due to edge loading. It is also NOT dependent on the driving force used. The bearings will bind whether hand or mechanically driven. This principle is a product of friction.

Working through the following equation will explain why this is a product of friction:

P = force being applied

L = distance out from shaft that P is being applied

s = center to center spacing of bearings

f = resultant force on bearings by shaft

F = friction force on each bearing

μ = coefficient of friction (about .25 when not moving)

Balance the moments: $f \bullet s = L \bullet P$

$L / s = f / P$

Compute friction force: $F = f \bullet \mu$

Note: Total friction force pushing up is 2 * F. To lock up the slide, the total friction force must be equal to (or greater than) P.

$P = 2 \bullet F = 2 \bullet f \bullet \mu$

Substitute for P:

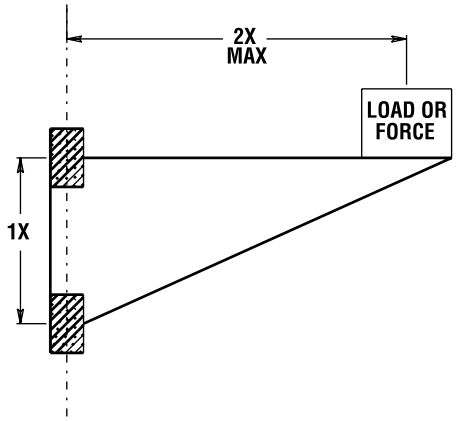
$L / s = f / (2 \bullet f \bullet \mu) = 1 / (2 \bullet \mu) = > L / s = 1 / (2 \bullet \mu)$

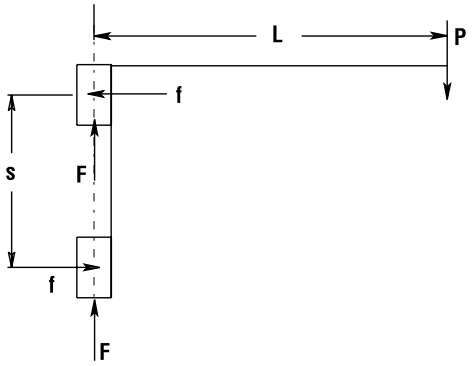
Note: The forces drop out of the equation.

Assume static coefficient of friction is .25 (μ = .25) then L / s = 2 That is the 2:1 ratio.

There may be other factors that add to the braking effect, but the coefficient of friction is the main cause.

Note: Proper lubrication can help to drop friction and extend the 2:1 ratio.





Cantilevered Loads Simplicity® Plain Bearings

Counterbalance

If holding the 2:1 ratio is not possible, one method of preventing binding problems is using a counter balance.

For efficient counter balances in horizontal applications, use this formula: M • Y = W • Z

Note: To avoid problems when running without mass:

(M) Z = 1-1/2 s

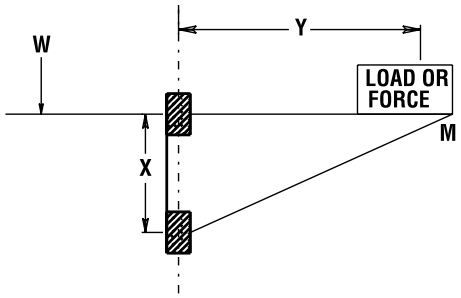
W can be calculated. Load on bearing will be:

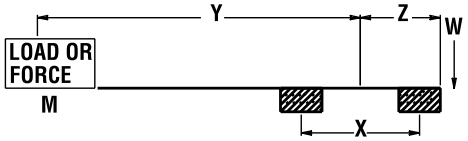
$$\frac{M + W}{\text{\# of bearings}}$$

Example: 50 • 24 = W • Z (Z = 1-1/2 • 6 = 9)

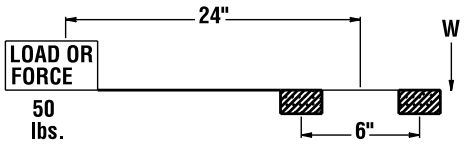
$$W = \frac{50 \bullet 24}{9} = 133 \text{ lbs.}$$

Load per bearing: $\frac{50 + 133}{4} = 45.75$ lbs. / bearing





EXAMPLE:



Cantilever Loads and Drive Force Location without Counterbalance

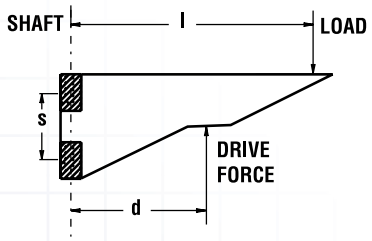
d = distance from shaft to Drive Force

l = distance from shaft to the load center of gravity

s = center-to-center spacing of the bearings on the shaft (If non-self-aligning, then outside to outside distance should be used.)

L = l / s = Load Force Ratio

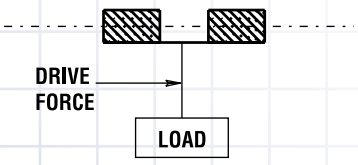
D = d / s = Drive Force Ratio



Hanging or "Top Heavy" Horizontal Applications with High Acceleration Rates:

If your application will have high acceleration forces, use this formula for the value of the Drive Force Ratio:

D = 0.8 • L x $\sqrt{a}$ where a is acceleration in g's.



General Rules:

1. Drive Force Ratio (D) should never be larger than 2. A Drive Force Ratio (D) larger than 2 can cause the slide to lock up.
2. Load Force Ratio (L) can be larger than 2, but as this ratio increases, the drive force required to move the slide increases dramatically. A Load Force Ratio (L) larger than 4 is not recommended.
3. If the slide is occasionally operated unloaded, use the distance to the slide's center of gravity as the distance to the load (l).

Vertical Applications:

1. If L is between 0 and 2, the lowest drive forces occur when the value of D is about 90% of L (D = .9 • L). However, D values between 0 and L will work fine.
2. If L is between 2 and 4, use this equation: D = 4 - L

Horizontal Applications:

For best results, the drive force should be applied as close to the shaft as possible no matter what the value of the Load Force Ratio (L) is.

Installation Simplicity® Linear Plain Bearings

Installing Simplicity® Bearings

Applies to standard linear bearing series.

For sleeve and flange bearings, see product pages 38–39, 60–62, 70–71, and 78–80.

STRAIGHT BORE HOUSING – PRESS FIT BEARING

This type of configuration is NOT recommended for the vast majority of applications using Simplicity bearings.

It does NOT allow for any misalignment or shaft deflection.

Misalignment or shaft deflection will cause the bearing to bind on the shafting.

Extremely high precision applications may be able to employ this type of mounting. Typically the shafting has been aligned with a laser or some other highly precise equipment.

Due to bore closure in the pressing process, use a "C" series (compensated I.D.) bearing.

Example: FLC24, FMC30, FJC30.

The recommended installation procedure is to freeze the bearings at 0°F (-17.75°C) for 30-45 minutes. Using gloves, remove the bearings from the freezer and slip them into the housing. As they heat to room temperature, full contact between bearing and housing will be achieved. The greatest advantage to this technique over traditional pressing is greater accuracy in alignment.

This type of mounting will not allow for misalignment or shaft deflection. Both are very critical in the smooth operation of Simplicity bearings. A rolling element bearing may appear to initially operate in this condition, but it is operating in an extremely preloaded condition and will prematurely fail and in most cases destroy the shafting. Simplicity bearings will indicate the problem immediately upon installation by failing to move due to the binding condition. There are alternative mounting options that work extremely well.

Part No.	MIN Housing I.D.	MAX Housing I.D.
	in.	in.
FLC03	0.3729	0.3737
FLC04	0.4978	0.4986
FLC06	0.6228	0.6236
FLC08	0.8725	0.8734
FLC10	1.1224	1.1234
FLC12	1.2474	1.2484
FLC16	1.5596	1.5607
FLC20	1.9970	1.9981
FLC24	2.3717	2.3729
FLC32	2.9965	2.9977
FLC40	3.7461	3.7473
FLC48	4.4953	4.4966
FLC64	5.9949	5.9963

Part No.	MIN Housing I.D.	MAX Housing I.D.
	mm	mm
FMC05	11.972	11.995
FMC08	15.954	15.972
FMC10	18.948	18.969
FMC12	21.944	21.965
FMC16	25.944	25.965
FMC20	31.940	31.961
FMC25	39.932	39.957
FMC30	46.932	46.957
FMC40	61.917	61.947
FMC50	74.917	74.947
FMC60	89.906	89.936
FMC80	119.886	119.921

Part No.	MIN Housing I.D.	MAX Housing I.D.
	mm	mm
FMTC06	11.954	11.972
FMTC08	14.954	14.972
FMTC10	16.954	16.972
FMTC12	18.948	18.969
FMTC14	20.944	20.965
FMTC16	23.944	23.965
FMTC20	27.944	27.965
FMTC25	34.940	34.961
FMTC30	39.932	39.957
FMTC40	51.932	51.957
FMTC50	61.917	61.947

Part No.	MIN Housing I.D.	MAX Housing I.D.
	mm	mm
FGC06	11.952	11.970
FGC08	14.952	14.970
FGC10	16.952	16.970
FGC12	21.945	21.966
FGC15	24.945	24.966
FGC16	25.945	25.966
FGC18	27.945	27.966
FGC20	31.945	31.966
FGC25	39.937	39.962
FGC30	44.937	44.962
FGC35	51.937	51.962
FGC40	59.927	59.957
FGC50	74.927	74.957

Part No.	MIN Housing I.D.	MAX Housing I.D.
	mm	mm
FJC06	11.961	11.979
FJHC08	14.961	14.979
FJC08	14.961	14.979
FJC10	18.952	18.973
FJC12	20.952	20.997
FJC13	22.952	22.973
FJC16	27.952	27.973
FJC20	31.950	31.971
FJC25	39.941	39.966
FJC30	44.941	44.966
FJC35	51.938	51.963
FJC38	56.938	56.963
FJC40	59.928	59.958
FJC50	79.922	79.952
FJC60	89.919	89.949
FJC80	119.899	119.934
FJC100	149.896	149.931
FJC120	179.875	179.915
FJC150	209.849	209.895

Installation Simplicity® Linear Plain Bearings

Straight Bore Housing - Slip Fit Bearing

There are three basic configurations that work well, depending on the misalignment and shaft deflection in the application:

1. Virtually No Misalignment

This method allows for NO or very little shaft deflection and misalignment. Standard I.D. bearings will need tighter alignment than a “C” series (compensated I.D.) bearing. Standard retention methods are acceptable.
Example: snap rings, epoxy, etc.

Note: If using epoxy, do not touch the bearing liner with the bonding agent.

This type of mounting will allow for minimum misalignment or shaft deflection. Both are very critical in the smooth operation of Simplicity bearings. A rolling element bearing may appear to initially operate in this condition, but it is operating in an extremely preloaded condition and will prematurely fail and in most cases destroy the shafting. Simplicity bearings will indicate the problem immediately upon installation by failing to move due to the binding condition.

Part No.	MIN Housing I.D.	MAX Housing I.D.
	in.	in.
FL03	0.3755	0.3764
FL04	0.5006	0.5017
FL06	0.6256	0.6267
FL08	0.8758	0.8771
FL10	1.1258	1.1271
FL12	1.2510	1.2525
FL16	1.5635	1.5650
FL20	2.0012	2.0030
FL24	2.3762	2.3780
FL32	3.0012	3.0030
FL40	3.7514	3.7535
FL48	4.5014	4.5035
FL64	6.0017	6.0042

Part No.	MIN Housing I.D.	MAX Housing I.D.
	mm	mm
FM05	12.016	12.043
FM08	16.016	16.043
FM10	19.020	19.053
FM12	22.020	22.053
FM16	26.020	26.053
FM20	32.025	32.064
FM25	40.025	40.064
FM30	47.025	47.064
FM40	62.030	60.076
FM50	75.030	75.076
FM60	90.036	90.090
FM80	120.036	120.090

Part No.	MIN Housing I.D.	MAX Housing I.D.
	mm	mm
FMT06	12.016	12.043
FMT08	15.016	15.043
FMT10	17.016	17.043
FMT12	19.020	19.053
FMT14	21.020	21.053
FMT16	24.020	24.053
FMT20	28.020	28.053
FMT25	35.025	35.064
FMT30	40.025	40.064
FMT40	52.030	52.076
FMT50	62.030	62.076

Part No.	MIN Housing I.D.	MAX Housing I.D.
	mm	mm
FG06	12.016	12.043
FG08	15.016	15.043
FG10	17.016	17.043
FG12	22.020	22.053
FG15	25.020	25.053
FG16	26.020	26.053
FG18	28.020	28.053
FG20	32.025	32.064
FG25	40.025	40.064
FG30	45.025	45.064
FG35	52.030	52.076
FG40	60.030	60.076
FG50	75.030	75.076

Part No.	MIN Housing I.D.	MAX Housing I.D.
	mm	mm
FJ06	12.016	12.043
FJH08	15.016	15.043
FJ08	15.016	15.043
FJ10	19.020	19.053
FJ12	21.020	21.053
FJ13	23.020	23.053
FJ16	28.020	28.053
FJ20	32.025	32.064
FJ25	40.025	40.064
FJ30	45.025	45.064
FJ35	52.030	52.076
FJ38	57.030	57.076
FJ40	60.030	60.076
FJ50	80.030	80.076
FJ60	90.036	90.090
FJ80	120.036	120.090
FJ100	150.043	150.106
FJ120	180.043	180.106
FJ150	210.050	210.122

Straight Bore Housing – Slip Fit Bearing

2. Standard Applications with Average Misalignment

A self-aligning O.D. bearing is recommended. **Example:** FLA24, FMA30, FJA30.

The recommended method of retention for this mounting is a snap ring at each end.

Note: Do not use epoxy in this configuration. It will lock the bearing in place not allowing it to self-align. Be sure to install the o-rings around the O.D. of the bearing to reduce noise while the bearing is in operation. FMT and FG series are NOT available with a self-aligning O.D.

Part No.	MIN Housing I.D. in.	MAX Housing I.D. in.
FLA03	0.3755	0.3764
FLA04	0.5006	0.5017
FLA06	0.6256	0.6267
FLA08	0.8758	0.8771
FLA10	1.1258	1.1271
FLA12	1.2510	1.2525
FLA16	1.5635	1.5650
FLA20	2.0012	2.0030
FLA24	2.3762	2.3780
FLA32	3.0012	3.0030
FLA40	3.7514	3.7535
FLA48	4.5014	4.5035
FLA64	6.0017	6.0042

Part No.	MIN Housing I.D. mm	MAX Housing I.D. mm
FMA05	12.016	12.043
FMA08	16.016	16.043
FMA10	19.020	19.053
FMA12	22.020	22.053
FMA16	26.020	26.053
FMA20	32.025	32.064
FMA25	40.025	40.064
FMA30	47.025	47.064
FMA40	62.030	60.076
FMA50	75.030	75.076
FMA60	90.036	90.090
FMA80	120.036	120.090

Part No.	MIN Housing I.D. mm	MAX Housing I.D. mm
FMT06	N/A	N/A
FMT08	N/A	N/A
FMT10	N/A	N/A
FMT12	N/A	N/A
FMT14	N/A	N/A
FMT16	N/A	N/A
FMT20	N/A	N/A
FMT25	N/A	N/A
FMT30	N/A	N/A
FMT40	N/A	N/A
FMT50	N/A	N/A

Part No.	MIN Housing I.D. mm	MAX Housing I.D. mm
FG06	N/A	N/A
FG08	N/A	N/A
FG10	N/A	N/A
FG12	N/A	N/A
FG15	N/A	N/A
FG16	N/A	N/A
FG18	N/A	N/A
FG20	N/A	N/A
FG25	N/A	N/A
FG30	N/A	N/A
FG35	N/A	N/A
FG40	N/A	N/A
FG50	N/A	N/A

Part No.	MIN Housing I.D. mm	MAX Housing I.D. mm
FJA06	12.016	12.043
FJHA08	15.016	15.043
FJA08	15.016	15.043
FJA10	19.020	19.053
FJA12	21.020	21.053
FJA13	23.020	23.053
FJA16	28.020	28.053
FJA20	32.025	32.064
FJA25	40.025	40.064
FJA30	45.025	45.064
FJA35	52.030	52.076
FJA38	57.030	57.076
FJA40	60.030	60.076
FJA50	80.030	80.076
FJA60	90.036	90.090
FJA80	120.036	120.090
FJA100	150.043	150.106
FJA120	180.043	180.106
FJA150	210.050	210.122

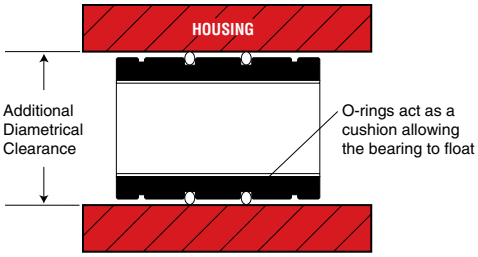
Straight Bore Housing – Slip Fit Bearing

3. Severe Misalignment

Possible Solutions for use with Standard "FL":

1. Undersize the bearing O.D. (see chart) and install o-rings.
2. Oversize the housing I.D. (see chart) and install the standard bearing with o-rings.

The additional clearance created by either method will allow the bearing to float in the housing and match the non-parallelism of the shafting.



CAUTION *This solution is only for SEVERE cases that the standard self-aligning will not accommodate.*

The recommended method of retention for this mounting is a snap ring at each end. Accessories, including o-rings can be found on page 17.

Note: Do not use epoxy in this configuration.
It will lock the bearing in place, not allowing it to self-align.

Part No.	MAX Additional Clearance in.
FL03	0.0070
FL04	0.0080
FL06	0.0080
FL08	0.0080
FL10	0.0100
FL12	0.0100
FL16	0.0120
FL20	0.0120
FL24	0.0120
FL32	0.0120
FL40	0.0160
FL48	0.0160
FL64	0.0200

Part No.	MAX Additional Clearance mm
FM05	0.203
FM08	0.203
FM10	0.203
FM12	0.203
FM16	0.254
FM20	0.254
FM25	0.305
FM30	0.305
FM40	0.305
FM50	0.305
FM60	0.406
FM80	0.508

Part No.	MAX Additional Clearance mm
FMT06	0.203
FMT08	0.203
FMT10	0.203
FMT12	0.203
FMT14	0.203
FMT16	0.254
FMT20	0.254
FMT25	0.254
FMT30	0.305
FMT40	0.305
FMT50	0.305

Part No.	MAX Additional Clearance mm
FG06	0.203
FG08	0.203
FG10	0.203
FG12	0.203
FG15	0.254
FG16	0.254
FG18	0.254
FG20	0.254
FG25	0.305
FG30	0.305
FG35	0.305
FG40	0.305
FG50	0.305

Part No.	MAX Additional Clearance mm
FJ06	0.203
FJH08	0.203
FJ08	0.203
FJ10	0.203
FJ12	0.203
FJ13	0.203
FJ16	0.254
FJ20	0.254
FJ25	0.305
FJ30	0.305
FJ35	0.305
FJ38	0.305
FJ40	0.305
FJ50	0.406
FJ60	0.406
FJ80	0.508
FJ100	0.610
FJ120	0.610
FJ150	0.610

Chemical Reaction Chart

The original Frelon® J has almost universal chemical inertness. Only molten sodium and fluorine at elevated temperatures and pressures show any signs of attack. It is approved for use with liquid oxygen, N202 hydrazine, UDMH, hydrocarbon fuels, high strength hydrogen peroxide, etc.

The Frelon GOLD® material is a composite of PTFE and a bearing filler. The PTFE is chemically inert. The chemical resistance shown in the chart below is defined by the compatibility of the filler with the various chemicals.

Other data in the chart below applies to the bearing shell and pillow block materials. The table is provided as a reference only. The data given will be affected by factors such as temperature, PV, degree of contact, strength of solution, etc. In each specific application, it is always advisable to conduct specific testing to determine suitability of use. This table only addresses general corrosion, NOT galvanic, SCC, or other types of corrosion. Corrosion rates are at room temperature unless otherwise noted.

Standard and hard coat data only apply when the coating is intact. If the coating is worn through or damaged, an area of galvanic and pitting corrosion will be created. Then use the bare aluminum data.

Standard Simplicity® products use aluminum alloy, which is known to have the best corrosion resistance of the high strength aluminum alloys. The sulfuric bath anodizing and nickel acetate sealing provide the best corrosion resistance available in anodized coatings. They can withstand a rigorous 14-day exposure in a 5% salt spray solution at 96°F per military specifications without significant damage. With the coating intact, it is considered to be inert in most fluids with a pH value between 5 and 8. Hard coat anodizing provides the same chemical resistance but is applied to a .002" thickness, providing a more durable surface that will stand up to greater abuse. However, if the coating is penetrated, the resistance is reduced.

Special stainless steel bearings use AISI 316 stainless, which has superior resistance over 303, 304, 420, 440, 17-4PH, and most other common stainless grades. 316 is generally considered to be the most corrosion resistant of conventional stainless steels.

Note: This information was compiled for Pacific Bearing® Company by Materials Engineering, Inc. of Virgil, IL. This specification information is believed to be accurate and reliable, however, no liability is assumed. Information is for reference only. User must test specific applications.

E = < .002" per year **G = < .020" per year** **S = <.050" per year** **U = > .050" per year**

Chemical	Frelon GOLD®	Bare Aluminum	Standard & Hard Coat Anodized Aluminum	316 Stainless Steel	Chemical	Frelon GOLD®	Bare Aluminum	Standard & Hard Coat Anodized Aluminum	.316 Stainless Steel
Acetic Acid, 20%	U	G	G	E	Hydrogen sulfide, dry	U	G	E	E
Acetone	G	E	E	E	JP-4	G	G	G	G
Ammonia, anhydrous	G	E	E	E	Kerosene	G	G	G	G
Ammonium hydroxide, 10%	U	U	U	E	Lacitic acid, 10%	G	G	G	E
Ammonium chloride, 10%	U	U	U	G	Magnesium chloride, 50%	G	U	U	G
Ammyl acetate (122°F / 50°C)	G	E	E	E	Mercury	U	U	U	E
Barium hydroxide	U	U	U	G	Methyl alcohol	G	G	G	G
Beer	G	E	E	E	Methyl ethyl ketone	G	G	G	G
Boric acid solutions	G	E	E	G	Methylene chloride	G	E	E	G
Butane	G	G	G	G	Mineral oil	G	G	G	G
Calcium chloride, 20%	G	G	G	G	Naptha	G	G	G	G
Calcium hydroxide, 10%	G	G	G	G	Nitric acid, 70%	U	U	U	E
Carbon dioxide	G	E	E	G	Phosphoric acid, 10%	U	U	U	E
Carbon monoxide	G	E	E	E	Sodium chloride	G	U	U	E
Chlorine gas, dry	G	G	G	G	Sodium hydroxide, 20%	G	U	U	G
Chlorine gas, wet	U	U	U	U	Sodium hypochlorite, 20%	U	G	G	U
Chromic acid, 10%	U	G	E	E	Sodium peroxide, 10%	U	G	G	G
Citric acid, 5%	G	E	E	E	Steam (see water)	-	-	-	-
Ethyl acetate	G	E	E	G	Sulfur dioxide, wet	U	U	U	G
Ethyl alcohol	G	E	E	G	Sulfur dioxide, dry	G	G	G	G
Ethylene glycol	G	E	E	G	Sulfur trioxide	U	G	G	G
Ferric chloride, 50%	U	U	U	U	Sulfuric acid, 50%	U	U	U	U
Formic acid - Anhydrous	U	E	E	E	Sulfurous acid	U	G	G	E
Gasoline, Unleaded	G	G	G	G	Toluene (122°F / 50°C)	G	E	E	E
Hydrochloric acid, 20%	U	U	U	U	Turpentine	G	G	E	E
Hydrochloric acid, 35%	U	U	U	U	Water, demineralized	U	G	E	E
Hydrocyanic acid, 10%	U	G	G	G	Water, distilled	G	U	S	G
Hydrofluoric acid - dilute	U	U	U	U	Sea Water	G	G	E	G
Hydrofluoric acid, 48%	I	U	U	U	Water, sewage	G	U	S	G
Hydrogen	G	E	E	E	Xylene	G	G	G	G
Hydrogen peroxide - dilute	U	E	E	G	Zinc chloride solutions	U	U	U	G

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