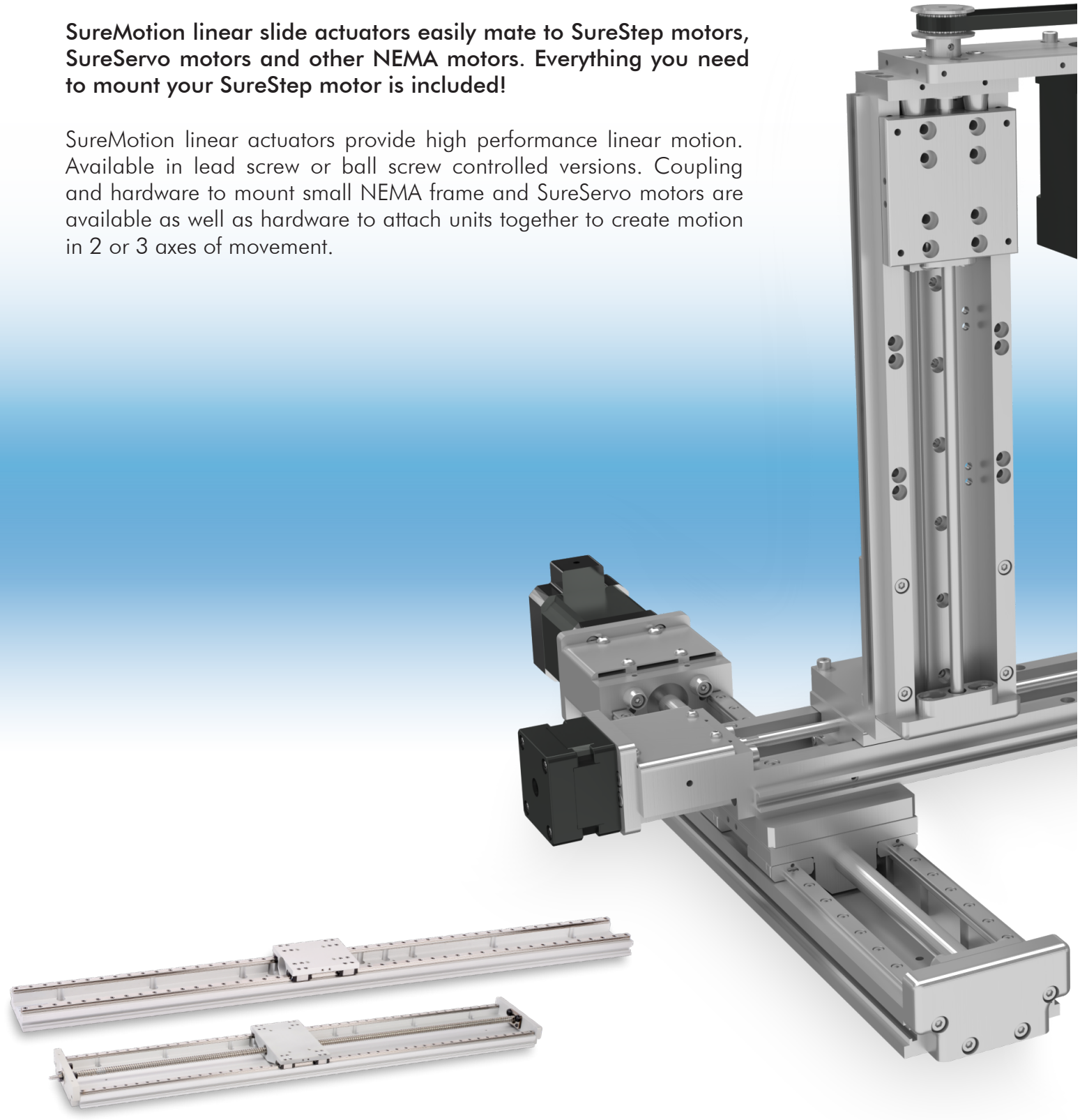
Linear Motion Slides and Components to Create up to 3 Axes of Motion

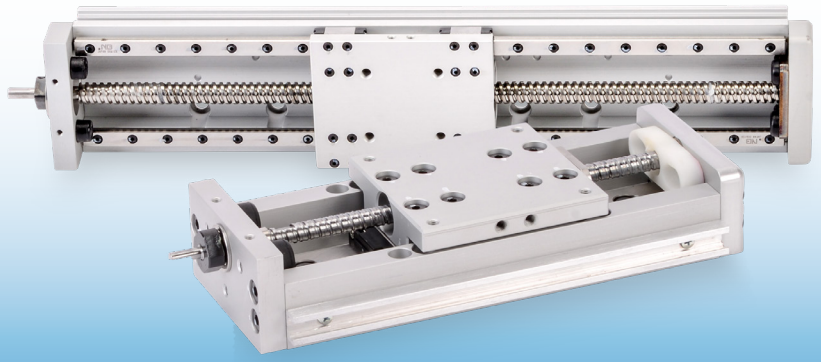
SureMotion linear slide actuators easily mate to SureStep motors, SureServo motors and other NEMA motors. Everything you need to mount your SureStep motor is included!

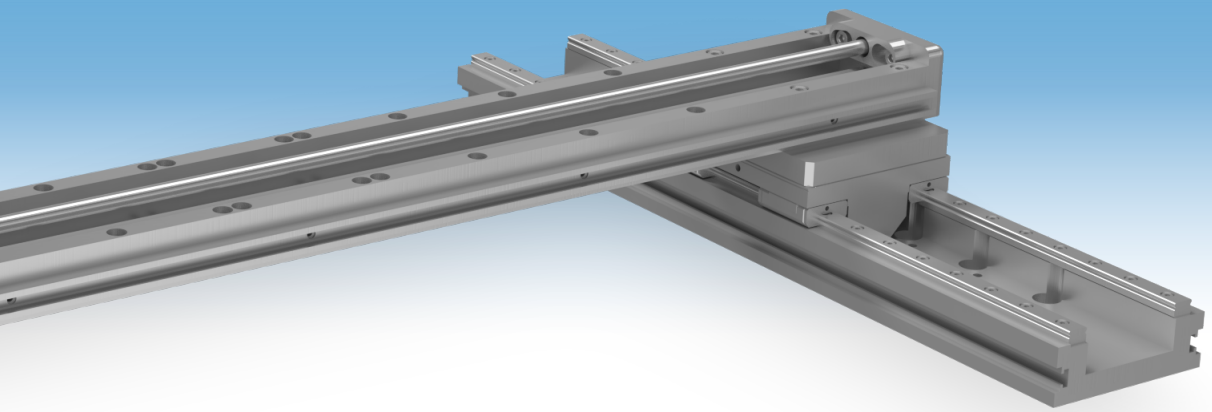
SureMotion linear actuators provide high performance linear motion. Available in lead screw or ball screw controlled versions. Coupling and hardware to mount small NEMA frame and SureServo motors are available as well as hardware to attach units together to create motion in 2 or 3 axes of movement.



Sure motion

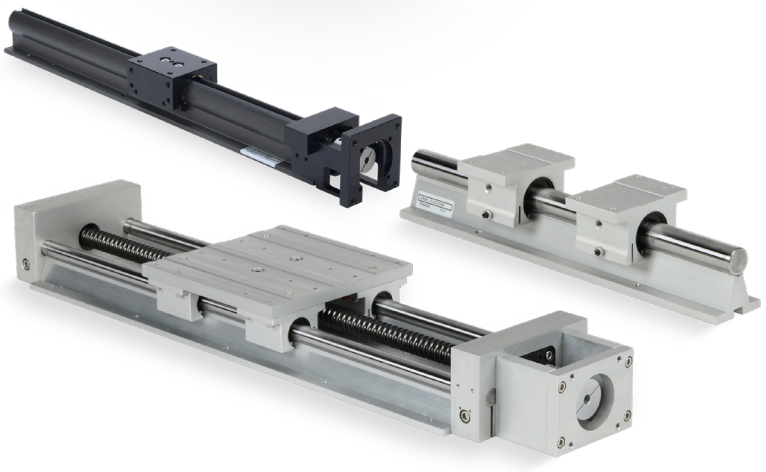
LAHP units can be attached to each other to provide up toa 3 axes of motion and from 52mm to 910mm of travel.





18 models, with travels from 6 to 36 inches

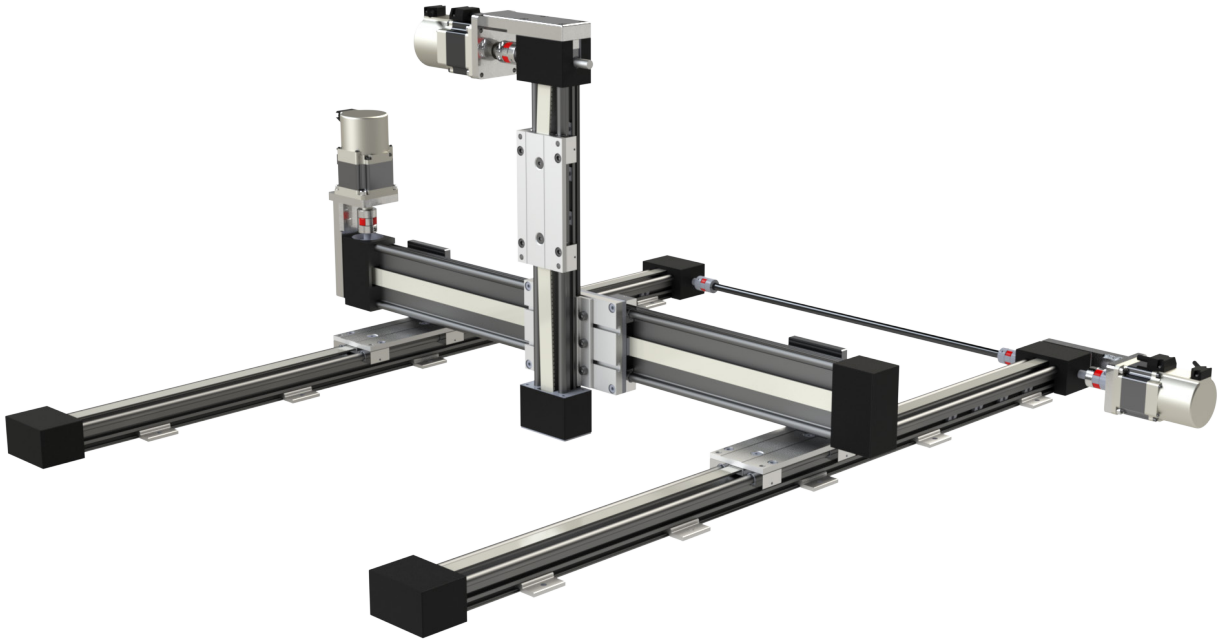
Ready to mount NEMA 17, 23 or 34 motors



igus XYZ Gantries Overview

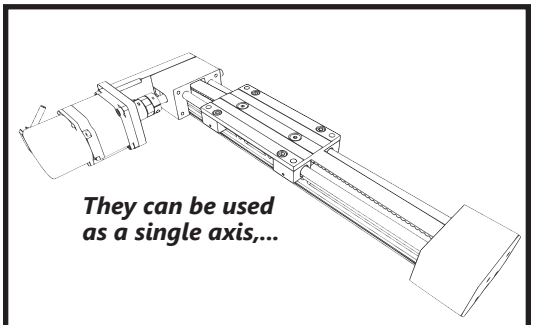
Features:

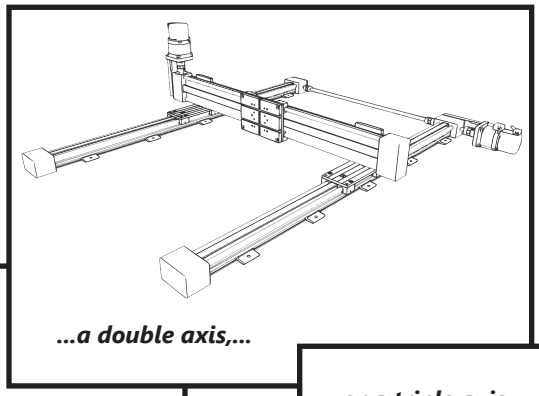
- Maintenance and Lubrication free
- Base/Rail material: 6061-T6 Aluminum with hard anodize finish
- Carriage Block Bushing Material: Drylin® iglide®-J
- Drive Type: Belt Drive or Lead Screw
- Adjustable Carriage Block Clearance
- Stackable and easy to assemble
- T-slots enable limit switches to be positioned anywhere
- Up to 1,000 mm Stroke
- Motor mounts for SureServo servo motors and SureStep stepper motors

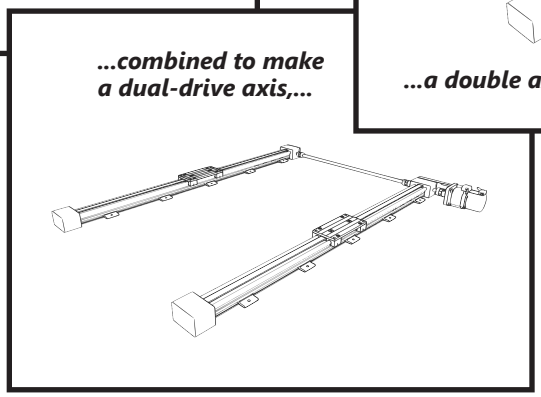


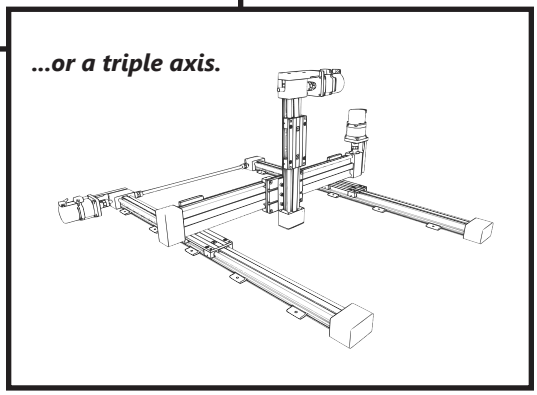
Configurations

igus linear actuators can be mounted in any orientation. However, overhead provides the best protection against contamination.





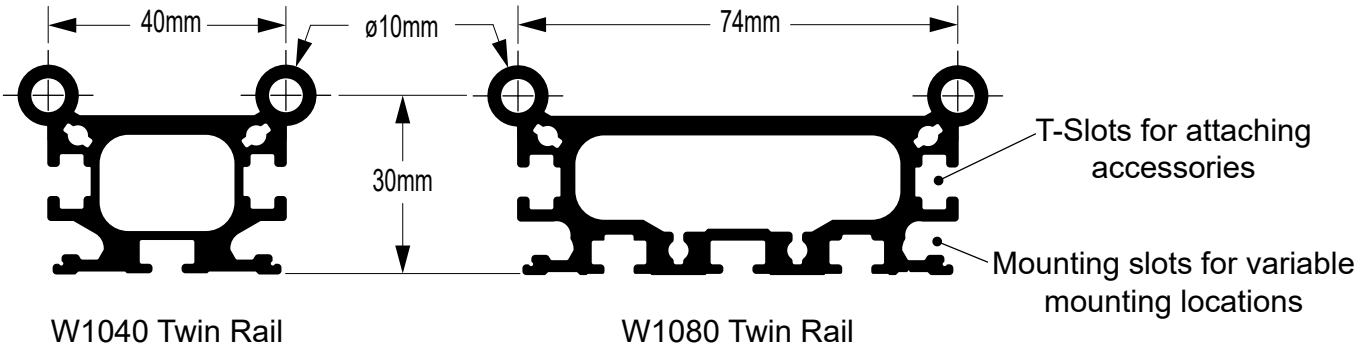




igus XYZ Gantries Overview

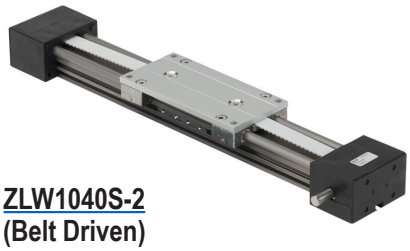
Rail Sizes

igus linear actuators are available in 2 rail sizes: W1040 and W1080.



Drive Types

igus linear actuators are available in 2 drive types: ZLW (Belt Driven) and SAW (Lead Screw Driven).



ZLW1040S-2
(Belt Driven)

ZLW1040 & ZLW1080

- Belt Drive
- Max Linear Speed: 1.5 m/s [4.92 ft/s]
- Max Stroke: 1000mm
- Available Accessories
  - Servo Motor Brackets
  - Stepper Motor Brackets
  - XY Plate
  - YZ Plate
  - Dual X connecting Drive Shaft
  - Sensor Bracket
  - Replacement Carriage Block Liners

SAW1040-2-B
(Lead Screw Driven)

SAW1040 & SAW1080

- Lead Screw Drive
- Max Linear Speed: 0.15 m/s [0.49 ft/s]
- Max Stroke: 750mm
- Available Accessories
  - Servo Motor Brackets
  - Stepper Motor Brackets
  - XY Plate
  - YZ Plate
  - Sensor Bracket
  - Replacement Carriage Block Liners
  - Replacement Lead Nut

ZLW Series (Belt Driven)

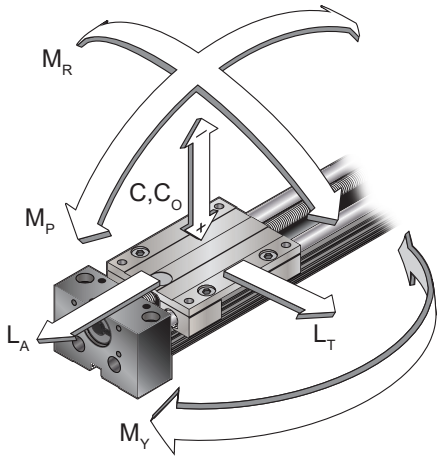
- Rail Material: 6061-T6 Aluminum, with Hard Anodize coating
- Carriage Block Bearing Material: iglide® J
- Belt Material: Polyurethane with steel cords, AT5 x 16mm wide
- ZLW1040 has Dual Input shafts, Ø10 mm
- ZLW1080 has Single Input shaft, Ø10 mm
- Adjustable clearance carriage blocks
- 8 T-slot nuts pre-installed, M5-0.8
- Mounting Clamps included

ZLW1040S-2

ZLW1080S-2

ZLW Series Linear Actuators (Belt Driven)											
Part Number	*Price*	*Stroke (mm)*	*Mass (kg)*	*Backlash (in [mm])*	*Efficiency*	*Pitch (in/rev [mm/ rev])*	*Max Linear Speed (ft/sec [m/sec])*	*Linear Position Accuracy (in [mm])*	*Linear Position Repeatability (in [mm])*	*Idle Torque (Nm)*	*Drawing Links*
ZLW1040S-2	$04o2q:	200	1.4	0.008 [0.2]	83%	2.76 [70]	4.92 [1.5]	0.008 [0.2]	0.008 [0.2]	0.3	PDF
ZLW1040S-3	$04o2s:	300	1.54								PDF
ZLW1040S-4	$;04o2t:	400	1.68								PDF
ZLW1040S-5	$04o2u:	500	1.82								PDF
ZLW1040S-6	$04o2v:	600	1.96								PDF
ZLW1040S-8	$04o2x:	800	2.24								PDF
ZLW1040S-10	$04o2y:	1,000	2.52								PDF
ZLW1080S-2	$04o2z:	200	1.8	0.008 [0.2]	85%	2.76 [70]	4.92 [1.5]	0.008 [0.2]	0.008 [0.2]	0.25	PDF
ZLW1080S-3	$;04o2]:	300	2.01								PDF
ZLW1080S-4	$;04o2[:	400	2.22								PDF
ZLW1080S-5	$04o2_:	500	2.43								PDF
ZLW1080S-6	$04o2#:	600	2.64								PDF
ZLW1080S-8	$;04o2!:	800	3.06								PDF
ZLW1080S-10	$04o2?:	1,000	3.48								PDF

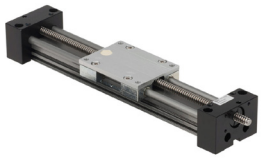
ZLW Series Linear Actuators (Belt Driven) Load Ratings		
Part Number	*ZLW1040S-xx*	*ZLW1080S-xx*
Dynamic Load Rating, C (lbf [N])	112.41 [500]	
Static Load Rating, C_0 (lbf [N])	1079.14 [4800]	
Reverse Static Load Rating, -C_0 (lbf [N])	224.82 [1000]	
Lateral Load Rating, L_T (lbf [N])	1079.14 [4800]	
Axial Load Rating, L_A (lbf [N])	16.86 [75]	
Pitch Moment Rating, M_P (lb·ft [N·m])	213.86 [290]	
Yaw Moment Rating, M_Y (lb·ft [N·m])	125.37 [170]	213.86 [290]
Roll Moment Rating, M_R (lb·ft [N·m])	70.8 [96]	131.27 [178]



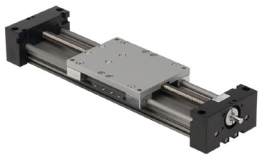
Note: The end blocks should not be used as a mechanical stop.
A buffer distance of 1 motor shaft revolution is recommended.

SAW Series (Lead Screw Driven)

- Rail Material: 6061-T6 Aluminum, with Hard Anodize coating
- Carriage Block Bearing Material: iglide® J
- Lead Screw Material: 300 series Stainless Steel
- Lead Nut Material: iglide® J
- Adjustable clearance carriage blocks
- 8 T-slot nuts pre-installed, M5-0.8
- Mounting Clamps included



SAW1040-2-B



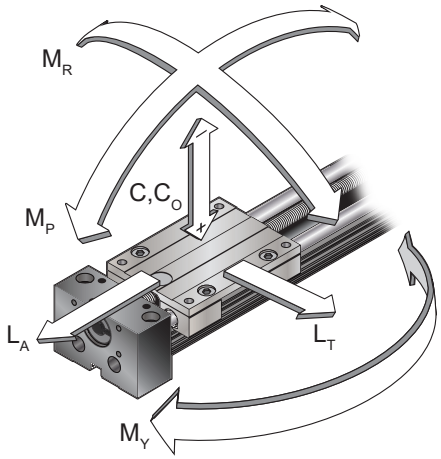
SAW1080-2-A

SAW Series Linear Actuators (Lead Screw Driven)

Part Number	Price	Stroke (mm)	Mass (kg)	Backlash (in [mm])	Efficiency	Pitch (in/rev [mm/rev])	Max Linear Speed (ft/sec [m/sec])	Linear Position Accuracy (in [mm])	Linear Position Repeatability (in [mm])	Idle Torque (Nm)	Drawing Links
SAW1040-05-B	$;04o3f:	50	1.05	0.004 [0.1]	67%	0.98 [25]	1.15 [0.35]	0.004 [0.1]	0.004 [0.1]	0.2	PDF
SAW1040-1-B	$04o3g:	100	1.1				1.31 [0.4]				PDF
SAW1040-1.5-B	$04o3h:	150	1.15								PDF
SAW1040-2-B	$-04o3i:	200	1.2				0.49 [0.15]				PDF
SAW1040-3-B	$-04o3j:	300	1.3								PDF
SAW1080-1-A	$04o35:	100	2.9	0.004 [0.1]	67%	0.98 [25]	0.49 [0.15]	0.004 [0.1]	0.004 [0.1]	0.3	PDF
SAW1080-1.5-A	$04o36:	150	3								PDF
SAW1080-2-A	$04o37:	200	3.1								PDF
SAW1080-3-A	$04o3a:	300	3.3								PDF
SAW1080-4-A	$04o3b:	400	3.5								PDF
SAW1080-5-A	$04o3c:	500	3.7								PDF
SAW1080-6-A	$04o3d:	600	3.9								PDF
SAW1080-7.5-A	$04o3e:	750	4.1								PDF

SAW Series Linear Actuators (Lead Screw Driven) Load Ratings

Part Number	SAW1080-xx	SAW1040-xx
Dynamic Load Rating, C (lbf [N])	168.62 [750]	
Static Load Rating, C_0 (lbf [N])	1079.14 [4800]	
Reverse Static Load Rating, $-C_0$ (lbf [N])	224.82 [1000]	
Lateral Load Rating, L_T (lbf [N])	1079.14 [4800]	
Axial Load Rating, L_A (lbf [N])	44.96 [200]	56.21 [250]
Pitch Moment Rating, M_P (lb·ft [N·m])	213.86 [290]	125.37 [170]
Yaw Moment Rating, M_Y (lb·ft [N·m])	213.86 [290]	125.37 [170]
Roll Moment Rating, M_R (lb·ft [N·m])	131.27 [178]	70.8 [96]



Note: The end blocks should not be used as a mechanical stop. A buffer distance of 1 motor shaft revolution is recommended.

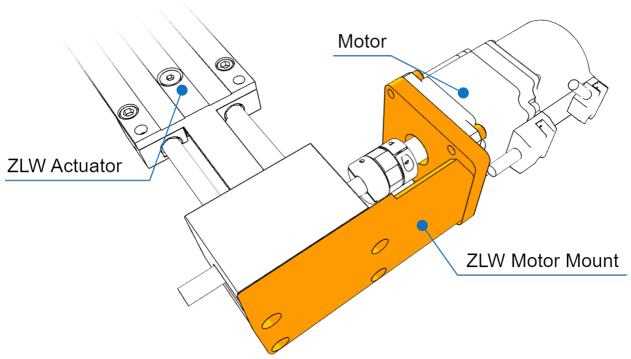
Motor Brackets

- Material: Aluminum
- Open frame for ease of assembly
- Available sizes for Stepper and Server motors

igus ZLW Motor Brackets					
Part Number	Price	Fits Motor	Recommended ADC Coupling Parts*		Drawing Links
			1040	1080	
STP17-ZLW	$04o3#:	NEMA 17 stepper motors	SJCA-30C-5 SJCA-30C-10 SJC-30-RD-SLEEVE		PDF
STP23-ZLW	$;04o3!:	NEMA 23 stepper motors	SJCA-30C-6.35 SJCA-30C-10 SJC-30-RD-SLEEVE		PDF
SVL201-ZLW	$;04o3[:	SVL-201 SVL-201B SV2L-201B SV2L-201N	SJCA-30C-8 SJCA-30C-10 SJC-30-RD-SLEEVE		PDF
SVL202-ZLW	$04o3_:	SVL-202 SVL-202B SV2L-202B SV2L-202N	SJCA-30C-14 SJCA-30C-10 SJC-30-RD-SLEEVE		PDF

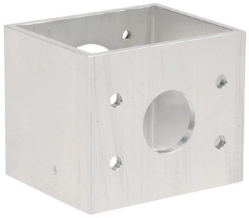
Includes Mounting Hardware.
***Drive coupling parts sold separately. 2 coupling jaws and 1 spider required for complete coupling subassembly.**

SVL201-ZLW

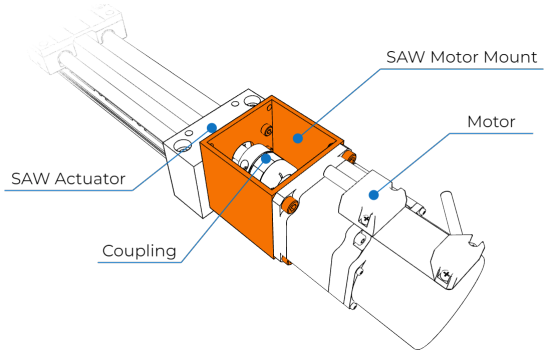


igus SAW Motor Brackets					
Part Number	Price	Fits Motor	Recommended ADC Coupling Parts*		Drawing Links
			1040	1080	
STP17-SAW	$04o41:	NEMA 17 stepper motors	SJCA-30C-5 SJCA-30C-10 SJC-30-RD-SLEEVE	SJCA-30C-5 SJCA-30C-8 SJC-30-RD-SLEEVE	PDF
STP23-SAW	$04o42:	NEMA 23 stepper motors	SJCA-30C-6.35 SJCA-30C-10 SJC-30-RD-SLEEVE	SJCA-30C-6.35 SJCA-30C-8 SJC-30-RD-SLEEVE	PDF
SVL201-SAW	$04o43:	SVL-201 SVL-201B SV2L-201B SV2L-201N	SJCA-30C-8 SJCA-30C-10 SJC-30-RD-SLEEVE	SJCA-30C-8 (x2) SJC-30-RD-SLEEVE	PDF
SVL202-SAW	$;04o3,:	SVL-202 SVL-202B SV2L-202B SV2L-202N	SJCA-30C-10 SJCA-30C-14 SJC-30-RD-SLEEVE	SJCA-30C-14 SJCA-30C-8 SJC-30-RD-SLEEVE	PDF

Includes Mounting Hardware.
***Drive coupling parts sold separately. 2 coupling jaws and 1 spider required for complete coupling subassembly.**



SVL201-SAW



Mounting Brackets

- Material: Aluminum
- Mounts directly to Carriage Plate

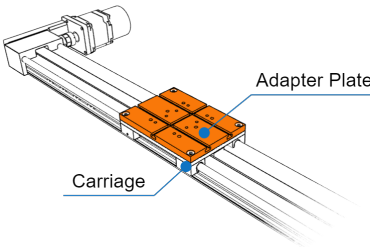
igus Mounting Brackets					
Part Number	***Price***	***Description***	***Holds Linear Actuator***	***Fits Linear Actuator Carriage Plate***	***Drawing Links***
A-SWY108003150	$05c1u:	Y or Z Adapter Plate (Qty. 2)	ZLW1040 and SAW1040	ZLW1080 and SAW1080 series actuators.	PDF
A-AK-0026	$04o33:	Y Mounting Bracket (Qty. 2)	ZLW080 and SAW1080	ZLW1040 and SAW1040 series actuators.	PDF
A-ZSY-104026	$5c1y:	Mounting Clamp (Qty. 2)*	All ZLW and SAW series actuators.	All ZLW and SAW series actuators.	PDF

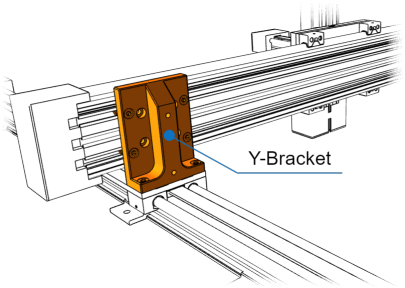
Includes Mounting Hardware.
***Mounts to Y or Z Adapter Plate.**

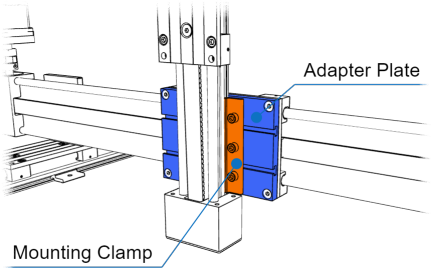
A-SWY108003150

A-AK-0026

A-ZSY-104026



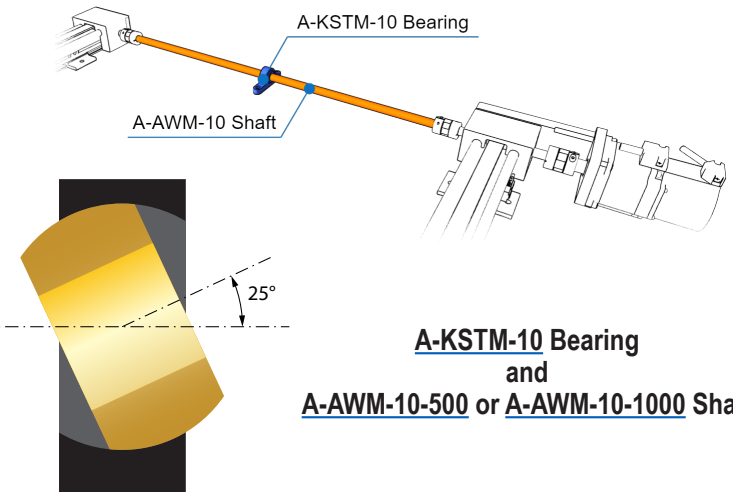




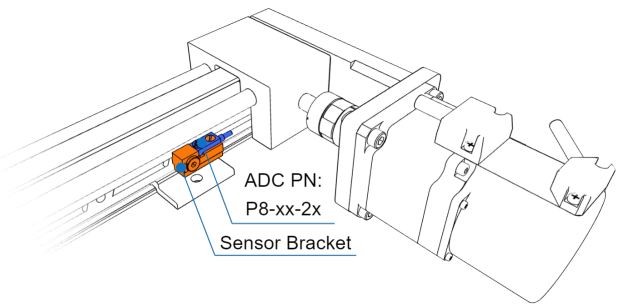
Accessories

igus Accessories							
Part Number	*Price*	*Description*	*Material*	*For Use With*	*Qty*	*Photo*	*Drawing Links*
A-AWM-10-1000	$4o30:	Drylin R Series Shaft: round connecting, 10mm diameter, 1000mm length	6060/6061 aluminum	All ZLW series actuators	1		PDF
A-AWM-10-500	$4o31:	Drylin R Series Shaft: round connecting, 10mm diameter, 500mm length	6060/6061 aluminum	All ZLW series actuators	1		PDF
A-KSTM-10	$4o32:	Igubal K Series Mounted Spherical Bearing: 10mm inside diameter, pillow block	Ball: Type L280 polymer Housing:	Drylin R series 10mm shafts	1		PDF
A-JUME-01-10	$4o38:	Bearing Liner: for ZLW1040 and ZLW1080 series actuators	iglide® J	ZLW1040 and ZLW1080 series actuators	4		N/A
A-NOR-20634	$;4o2,:	M5 Slot Nut: for all ZLW and SAW series actuators	zinc plated steel	All ZLW and SAW series actuators	8		PDF
IGUS-SENSBKT	$4o44:	Sensor Bracket: for all ZLW and SAW series actuators	anodized aluminum	All ZLW and SAW series actuators Compatible Sensors: P8-AN-2A, P8-AP-2F, P8-CP-2F	1		PDF
NUT1040-25	$5c1x:	Lead Nut: for SAW1040 series actuators	iglide® J	SAW1040 series actuators	1		N/A
NUT1080-25	$5c1v:	Lead Nut: for SAW1080 series actuators	iglide® J	SAW1080 series actuators	1		N/A

Includes Mounting Hardware.



A-KSTM-10 Bearing and A-AWM-10-500 or A-AWM-10-1000 Shaft



IGUS-SENSBKT

SureMotion® XYZ Gantries

SureMotion® XYZ Gantry Features

The SureMotion® XYZ Gantry offers high-performance linear positioning at an economical price. This system uses recirculating ball linear guides which offer smooth motion and high load capacity. A ball screw version is available for higher speeds and duty cycles.

- Rigid linear bearings
- Lightweight precision aluminum base
- Stackable and easy to assemble
- High-Precision
- Customizable
- Lead or ball screw options
- Wide base available for maximum stiffness
- Up to 910mm stroke
- Anti-backlash leadscrew nut
- Proximity or photoelectric sensor kits available
- Motor mounts available for SureServo® servo motors and SureStep® stepper motors

SureMotion® XYZ Gantries

LAHP-25 Series Linear Actuators

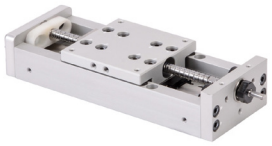
Part Number	Price	Stroke	Type	Efficiency	Pitch	Max Linear Speed	Linear Position Accuracy	Linear Position Repeatability	Drawing Links
LAHP-25TM52B3M	$;004oq?:	52mm	ball screw	90%	3mm	0.150 m/s	±0.039 mm	±0.05 mm	PDF
LAHP-25TM52LP25	$;004oqy:	52mm	lead screw	60%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-25TM102B3M	$;;004oq,:	102mm	ball screw	90%	3mm	0.150 m/s	±0.0765 mm	±0.05 mm	PDF
LAHP-25TM102LP25	$;004oqz:	102mm	lead screw	60%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-25TM152B3M	$;004os0:	152mm	ball screw	90%	3mm	0.150 m/s	±0.114 mm	±0.05 mm	PDF
LAHP-25TM152LP25	$;;004oq]:	152mm	lead screw	60%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-25TM220B3M	$;004os1:	220mm	ball screw	90%	3mm	0.150 m/s	±0.165 mm	±0.05 mm	PDF
LAHP-25TM220LP25	$;;004oq[:	220mm	lead screw	60%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-25TM304B3M	$;004os2:	304mm	ball screw	90%	3mm	0.140 m/s	±0.228 mm	±0.05 mm	PDF
LAHP-25TM304LP25	$;004oq_:	304mm	lead screw	60%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-25TM404B3M	$;004os3:	404mm	ball screw	90%	3mm	0.085 m/s	±0.303 mm	±0.05 mm	PDF
LAHP-25TM404LP25	$;004oq#:	404mm	lead screw	60%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-25TM504B3M	$;004os4:	504mm	ball screw	90%	3mm	0.060 m/s	±0.378 mm	±0.05 mm	PDF
LAHP-25TM504LP25	$;;004oq!:	504mm	lead screw	60%	0.25in	0.085 m/s		±0.013 mm	PDF

LAHP 25 Series Linear Slides

Part Number	Price	Stroke	Max Linear Speed	Drawing Links
LAHP-25TM52SF	$04os5:	52mm	1.5 m/s	PDF
LAHP-25TM102SF	$04os6:	102mm		PDF
LAHP-25TM152SF	$04os7:	152mm		PDF
LAHP-25TM220SF	$04os8:	220mm		PDF
LAHP-25TM304SF	$04os9:	304mm		PDF
LAHP-25TM404SF	$;004osa:	404mm		PDF
LAHP-25TM504SF	$;004osb:	504mm		PDF

LAHP 25 Series Linear Actuators Specifications

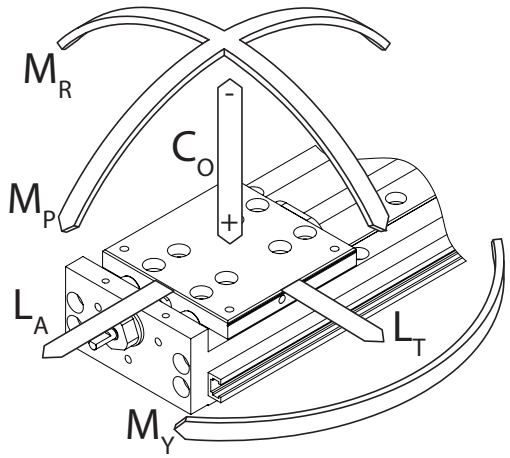
Max Lateral Load, L_T	480N	108 lbf
Max Axial Load, L_A	350N	78.7 lbf
Roll Moment Rating , M_R	36N·m	26.6 lb·ft
Pitch Moment Rating, M_P	48N·m	35.4 lb·ft
Yaw Moment Rating, M_Y	20N·m	14.6 lb·ft
Static Radial Load Rating, C_0	5060N	1138 lbf
Reverse Static Radial Load Rating, $-C_0$	5060N	1138 lbf
Dynamic Load Rating, C	3420N	769 lbf



Linear Actuator
LAHP-25TM52B3M

Linear Slide
LAHP-25TM52SF

*Same mechanical design as Linear Actuator, not driven



SureMotion® XYZ Gantries

LAHP 33 Series Linear Actuators

Part Number	Price	Stroke	Type	Efficiency	Pitch	Max Linear Speed	Linear Position Accuracy	Linear Position Repeatability	Drawing Links
LAHP-33TM210B10M	$;-004osj:	210mm	ball screw	90%	10mm	0.500 m/s	±0.158 mm	±0.05 mm	PDF
LAHP-33TM210LP25	$;004osc:	210mm	lead screw	58%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-33TM310B10M	$;004osk:	310mm	ball screw	90%	10mm	0.500 m/s	±0.233 mm	±0.05 mm	PDF
LAHP-33TM310LP25	$;004osd:	310mm	lead screw	58%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-33TM410B10M	$;-004osl:	410mm	ball screw	90%	10mm	0.467 m/s	±0.308 mm	±0.05 mm	PDF
LAHP-33TM410LP25	$;004ose:	410mm	lead screw	58%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-33TM510B10M	$;004osn:	510mm	ball screw	90%	10mm	0.333 m/s	±0.383 mm	±0.05 mm	PDF
LAHP-33TM510LP25	$;;004osf:	510mm	lead screw	58%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-33TM610B10M	$;004oso:	610mm	ball screw	90%	10mm	0.250 m/s	±0.458 mm	±0.05 mm	PDF
LAHP-33TM610LP25	$;004osg:	610mm	lead screw	58%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-33TM810B10M	$;004osp:	810mm	ball screw	90%	10mm	0.133 m/s	±0.608 mm	±0.05 mm	PDF
LAHP-33TM810LP25	$;004osh:	810mm	lead screw	58%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-33TM910B10M	$;004osq:	910mm	ball screw	90%	10mm	0.122 m/s	±0.683 mm	±0.05 mm	PDF
LAHP-33TM910LP25	$;-004osi:	910mm	lead screw	58%	0.25in	0.077 m/s		±0.013 mm	PDF

LAHP 33 Series Linear Slides

Part Number	Price	Stroke	Max Linear Speed	Drawing Links
LAHP-33TM210SF	$04oss:	210mm	1.5 m/s	PDF
LAHP-33TM310SF	$;;004ost:	310mm		PDF
LAHP-33TM410SF	$;004osu:	410mm		PDF
LAHP-33TM510SF	$;004osv:	510mm		PDF
LAHP-33TM610SF	$;004osx:	610mm		PDF
LAHP-33TM810SF	$;004osy:	810mm		PDF
LAHP-33TM910SF	$;004osz:	910mm		PDF

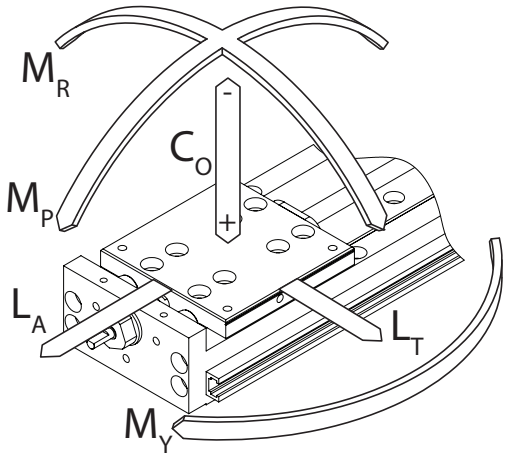
LAHP 33 Series Linear Actuators Specifications

Max Lateral Load, L_T	480N	108 lbf
Max Axial Load, L_A	890N	200 lbf
Roll Moment Rating , M_R	109N·m	80.4 lb·ft
Pitch Moment Rating, M_P	133N·m	98.1 lb·ft
Yaw Moment Rating, M_Y	25N·m	18.4 lb·ft
Static Radial Load Rating, C_0	6760N	1520 lbf
Reverse Static Radial Load Rating, $-C_0$	6760N	1520 lbf
Dynamic Load Rating, C	5120N	1151 lbf

Linear Actuator
LAHP-33TM210B10M

Linear Slide*
LAHP-33TM210SF

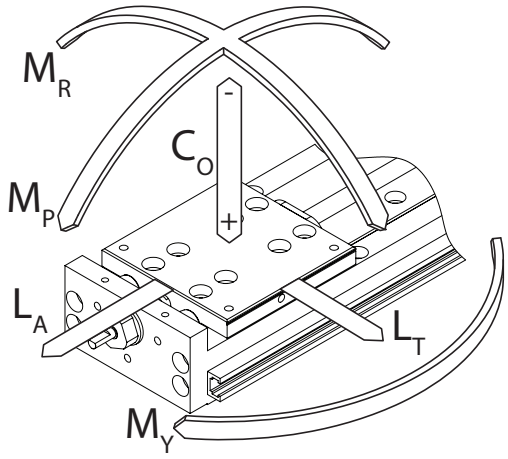
*Same mechanical design as Linear Actuator, not driven

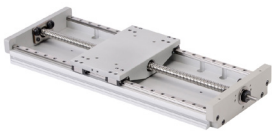


SureMotion® XYZ Gantries

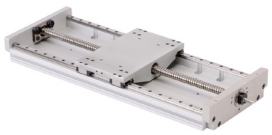
LAHP 33W (Wide) Series Linear Actuators									
Part Number	*Price*	*Stroke*	*Type*	*Efficiency*	*Pitch*	*Max Linear Speed*	*Linear Position Accuracy*	*Linear Position Repeatability*	*Drawing Links*
LAHP-33WTM210B10M	$;;004ot0:	210mm	ball screw	90%	10mm	0.500 m/s	±0.158 mm	±0.05 mm	PDF
LAHP-33WTM210LP25	$;;004os]:	210mm	lead screw	58%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-33WTM310B10M	$;;004ot1:	310mm	ball screw	90%	10mm	0.500 m/s	±0.233 mm	±0.05 mm	PDF
LAHP-33WTM310LP25	$;;004os[:	310mm	lead screw	58%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-33WTM410B10M	$;;004ot2:	410mm	ball screw	90%	10mm	0.467 m/s	±0.308 mm	±0.05 mm	PDF
LAHP-33WTM410LP25	$;004os_:	410mm	lead screw	58%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-33WTM510B10M	$;;004ot3:	510mm	ball screw	90%	10mm	0.333 m/s	±0.383 mm	±0.05 mm	PDF
LAHP-33WTM510LP25	$;004os#:	510mm	lead screw	58%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-33WTM610B10M	$;;004ot4:	610mm	ball screw	90%	10mm	0.250 m/s	±0.458 mm	±0.05 mm	PDF
LAHP-33WTM610LP25	$;;004os!:	610mm	lead screw	58%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-33WTM810B10M	$;;004ot5:	810mm	ball screw	90%	10mm	0.133 m/s	±0.608 mm	±0.05 mm	PDF
LAHP-33WTM810LP25	$;004os?:	810mm	lead screw	58%	0.25in	0.085 m/s		±0.013 mm	PDF
LAHP-33WTM910B10M	$;;004ota:	910mm	ball screw	90%	10mm	0.122 m/s	±0.683 mm	±0.05 mm	PDF
LAHP-33WTM910LP25	$;;004os,:	910mm	lead screw	58%	0.25in	0.077 m/s		±0.013 mm	PDF

LAHP 33W Series Linear Actuators Specifications		
Max Lateral Load, L_T	480N	108 lbf
Max Axial Load, L_A	890N	200 lbf
Roll Moment Rating , M_R	218N·m	160.8 lb·ft
Pitch Moment Rating, M_P	133N·m	98.1 lb·ft
Yaw Moment Rating, M_Y	25N·m	18.4 lb·ft
Static Radial Load Rating, C_O	6760N	1520 lbf
Reverse Static Radial Load Rating, $-C_O$	6760N	1520 lbf
Dynamic Load Rating, C	5120N	1151 lbf





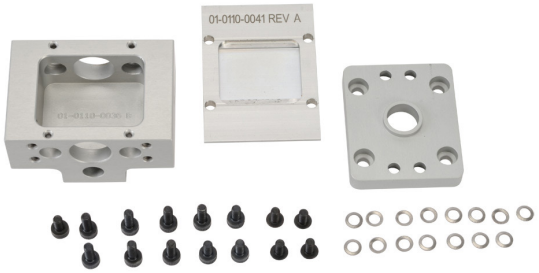
Linear Actuator (Wide)
LAHP-33WTM210B10M



Lead Screw Actuator (Wide)
LAHP-33WTM210LP25

SureMotion® XYZ Gantries

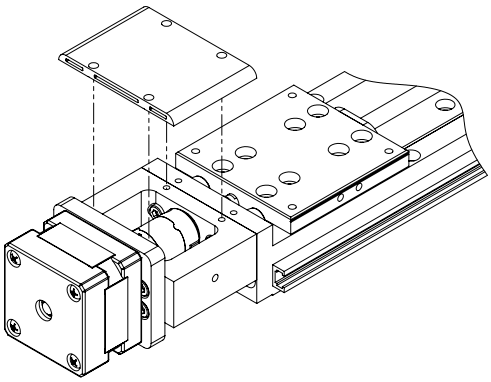
LAHP Series Motor Brackets					
Part Number	*Price*	*Bracket Type*	*Actuator Compatilibility*	*Motor Compatibility*	*Drawing Links*
LAHP-201-25MTRBKT	$;;04otf:	axial	LAHP-25	SureServo® SV2L-201B and SV2L-201N	PDF
LAHP-201-33MTRBKT	$;04otg:	axial	LAHP-33/33W	SureServo® SV2L-201B and SV2L-201N	PDF
LAHP-202-33MTRBKT	$;04oth:	axial	LAHP-33/33W	SureServo® SV2L-202B, SV2L-202N, SV2L-204B, and SV2L-204N	PDF
LAHP-N14-25MTRBKT	$;04ot6:	axial	LAHP-25	SureStep® NEMA 14 stepper motors	PDF
LAHP-N14-25WRPBKT	$;04ot7:	parallel	LAHP-25	SureStep® NEMA 14 stepper motors	PDF
LAHP-N17-25MTRBKT	$;04ot8:	axial	LAHP-25	SureStep® NEMA 17 stepper motors	PDF
LAHP-N17-25WRPBKT	$;04ot9:	parallel	LAHP-25	SureStep® NEMA 17 stepper motors	PDF
LAHP-N17-33MTRBKT	$;04otb:	axial	LAHP-33/33W	SureStep® NEMA 17 stepper motors	PDF
LAHP-N17-33WRPBKT	$;04otc:	parallel	LAHP-33/33W	SureStep® NEMA 17 stepper motors	PDF
LAHP-N23-33MTRBKT	$;04otd:	axial	LAHP-33/33W	SureStep® NEMA 23 stepper motors	PDF
LAHP-N23-33WRPBKT	$;04ote:	parallel	LAHP-33/33W	SureStep® NEMA 23 stepper motors	PDF

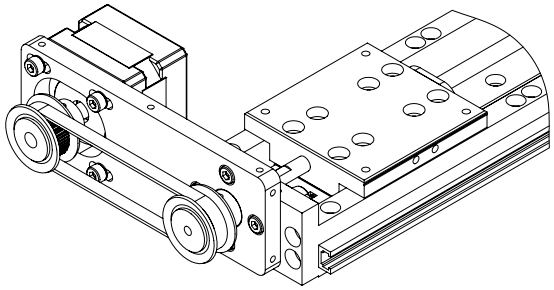


NEMA 14 Axial Motor Bracket*
LAHP-N14-25MTRBKT

NEMA 14 Parallel Motor Bracket
LAHP-N14-25WRPBKT

***Coupling Sold Separately**

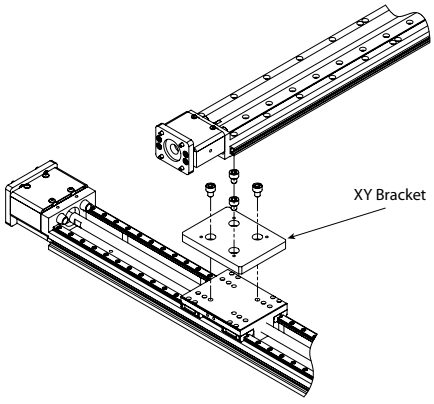


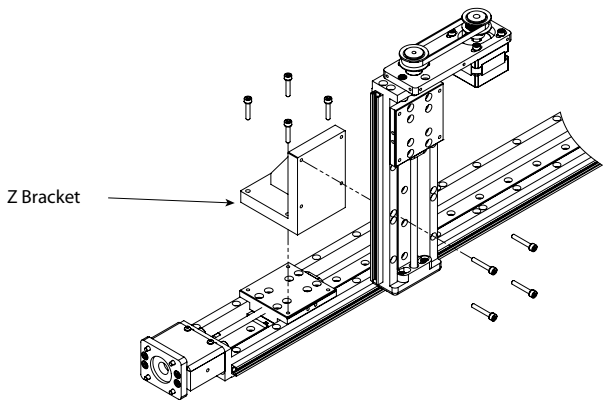


LAHP Series Drive Couplings						
Part Number	*Price*	*Actuator Side Bore*	*Motor Side Bore*	*Actuator Compatibility*	*Motor Compatibility*	*Drawing Links*
LAHP-25-CPL-201	$;4oto:	3mm	8mm	LAHP-25	SureServo® SV2L-201B and SV2L-201N	PDF
LAHP-25-CPL-N1417	$;-4oti:	3mm	5mm	LAHP-25	SureStep® NEMA 14/17	PDF
LAHP-33-CPL-201	$;4otp:	5mm	8mm	LAHP-33/33W	SureServo® SV2L-201B and SV2L-201N	PDF
LAHP-33-CPL-202	$;4otq:	5mm	14mm	LAHP-33/33W	SureServo® SV2L-202B, SV2L-202N, SV2L-204B, and SV2L-204N	PDF
LAHP-33-CPL-N17	$;-4otj:	5mm	5mm	LAHP-33/33W	SureStep® NEMA 17	PDF
LAHP-33CPL-N23	$;4otk:	5mm	1/4in	LAHP-33/33W	SureStep® NEMA 23	PDF

Stepper Motor Coupling (NEMA 14 & 17)
LAHP-25-CPL-N1417

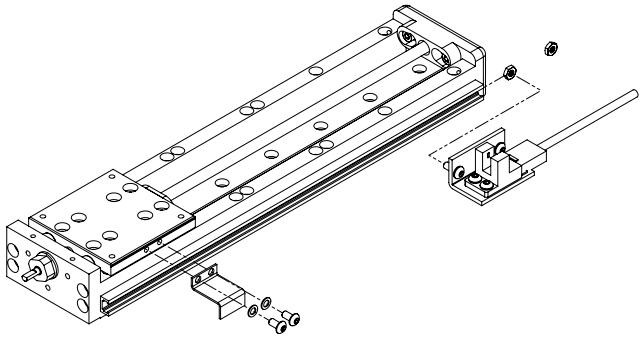
LAHP Series XY and Z Brackets				
Part Number	*Price*	*Bracket Type*	*Description*	*Drawing Links*
LAHP-XYB-25-33	$;04otx:	XY bracket	SureMotion® mounting bracket, anodized aluminum, XY bracket. For use with LAHP-25 to LAHP-33 series actuators.	PDF
LAHP-XYB-25-33W	$;04otv:	XY bracket	SureMotion® mounting bracket, anodized aluminum, XY bracket. For use with LAHP-25 to LAHP-33W series actuators.	PDF
LAHP-XYB-33-33W	$;04otu:	XY bracket	SureMotion® mounting bracket, anodized aluminum, XY bracket. For use with LAHP-33 to LAHP-33W series actuators.	PDF
LAHP-ZB-25-25	$;04ot_:	Z bracket	SureMotion® mounting bracket, anodized aluminum, Z bracket. For use with LAHP-25 to LAHP-25 series actuators.	PDF
LAHP-ZB-25-33	$;;04ot[:	Z bracket	SureMotion® mounting bracket, anodized aluminum, Z bracket. For use with LAHP-25 to LAHP-33 series actuators.	PDF
LAHP-ZB-25-33W	$;04otz:	Z bracket	SureMotion® mounting bracket, anodized aluminum, Z bracket. For use with LAHP-25 to LAHP-33W series actuators.	PDF
LAHP-ZB-33-33	$;;04ot]:	Z bracket	SureMotion® mounting bracket, anodized aluminum, Z bracket. For use with LAHP-33 to LAHP-33 series actuators.	PDF
LAHP-ZB-33-33W	$;04oty:	Z bracket	SureMotion® mounting bracket, anodized aluminum, Z bracket. For use with LAHP-33 to LAHP-33W series actuators.	PDF



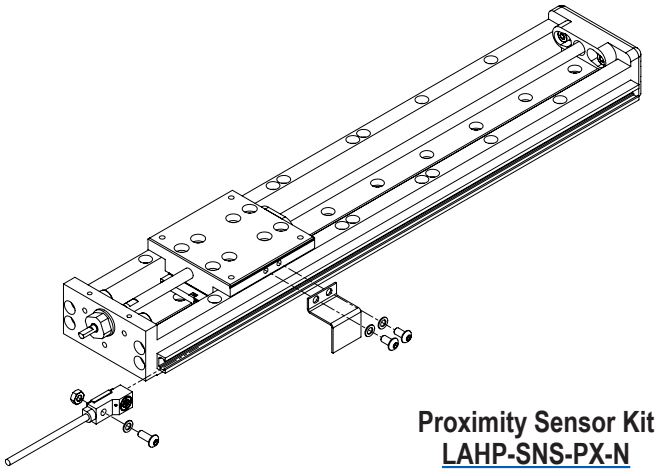


LAHP Series Sensors				
Part Number	*Price*	*Sensor Type*	*Output*	*Drawing Links*
LAHP-SNS-PH-N	$;-04otl:	photoelectric sensor	NPN	PDF
LAHP-SNS-PH-P	$;04otn:	photoelectric sensor	PNP	PDF
LAHP-SNS-PX-N	$;04ots:	proximity sensor	NPN	PDF
LAHP-SNS-PX-P	$;;04ott:	proximity sensor	PNP	PDF

NOTE: 3 Sensors included in each kit



Photoelectric Sensor Kit
LAHP-SNS-PH-N



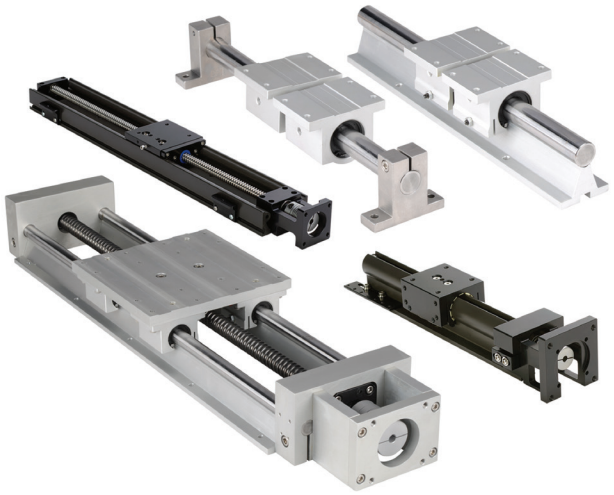
Proximity Sensor Kit
LAHP-SNS-PX-N

LAHP Lead Nut Replacement Kit		
Part Number	*Price*	*Description*
LAHP-25-NUT-LP25	$04ou2:	SureMotion® lead nut, replacement, 0.25in pitch. For use with LAHP-25 series actuators.
LAHP-33-NUT-LP25	$04ou3:	SureMotion® lead nut, replacement, 0.25in pitch. For use with LAHP-33 series actuators.

Product Overview

Actuator Overview

SureMotion linear motion offers both motor-ready actuator assemblies, and a versatile assortment of sliding components and accessories to provide a wide variety of motion control solutions.

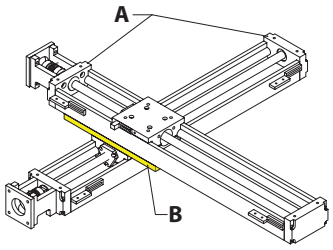


Linear Slide Actuator Comparisons

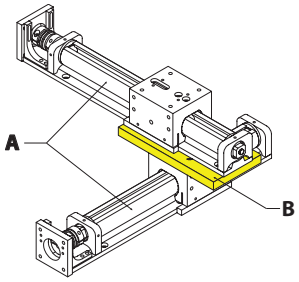
Actuator Series Comparisons						
Actuator Series	*Actuator Type*	*Drive Type*	*Max Load Capacity (lb)*	*Max Speed (in/s)*	*Travel (in)*	*Relative Price*
LARSD2	Twin Round Shaft	Ball Screw	920	6	12, 24	$$$$
LACP2	Compact Slide	Lead Screw	125	20	6, 12, 24, 36	$$
LAVL2	Value Slide	Lead Screw	110	15	6, 12, 18, 24	$

Available Multi-Axis Configurations

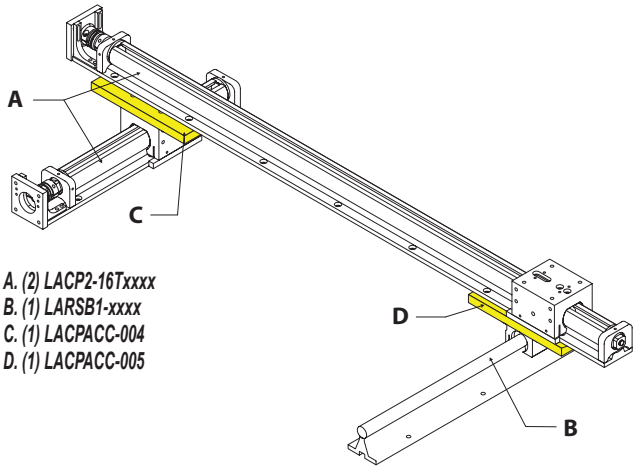
X-Y Axis Configurations



A. (2) LAVL2-60Txxxx
B. (1) LAVLACC-004

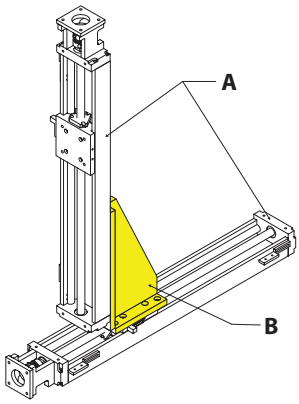


A. (2) LACP2-16Txxxx
B. (1) LACPACC-004



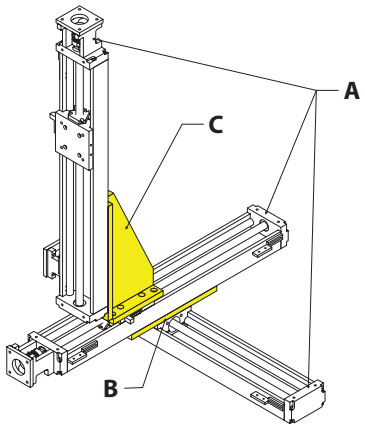
A. (2) LACP2-16Txxxx
B. (1) LARSB1-xxxx
C. (1) LACPACC-004
D. (1) LACPACC-005

X-Z Axis Configuration

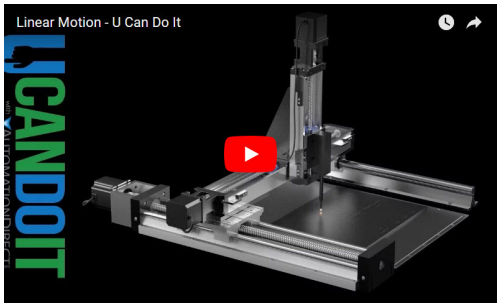


A. (2) LAVL2-60Txxxx
B. (1) LAVLACC-005

X-Y-Z Axis Configuration

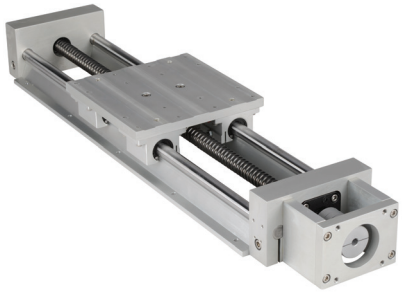


A. (3) LAVL2-60Txxxx
B. (1) LAVLACC-004
C. (1) LAVLACC-005



Click on the above video link for a short visual example of how our products can be used.

Twin Round Shaft Slide Actuators



LARSD2-08T12BP2C

Description

Continuously-supported round rail slide with ball screw actuation provides a very robust precision linear motion. Units are complete except for a drive motor.

Features

- High-accuracy ball screw
- Continuously-supported guide rails
- Replacement components available
- Ready for NEMA 23 motor
- AISI 1566 Carbon Steel, 60 RC Round Shafts
- AISI 1045 Carbon Steel , 56 RC Ball Screw

Applications

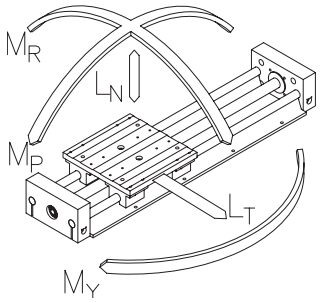
- Positioning systems
- Heavy loads

Twin Round Shaft Slide Actuator Specifications

Part Number	Price	Drive Type	Drive Pitch	Drive Screw Efficiency (%)	Payload Inertia Factor (in2)	Constant System Inertia (lbm-in2)	Travel	Weight (lb)	Fits Motor
LARSD2-08T12BP2C	$;-0010j1:	Ball screw	0.2 in	83	0.001	0.11	12in	10.5	NEMA 23
LARSD2-08T24BP2C	$;-0010j2:					0.16	24in	14.0	

System Inertia Calculation:

- To calculate the inertia reflected to the motor in a particular actuator, multiply the carriage payload by the payload inertia factor and then add the constant system inertia value for that actuator. The constant system inertia value for each system includes the inertia of the shaft coupler, carriage, and lead/ball screw.
- The payload must be in units of lb_m.



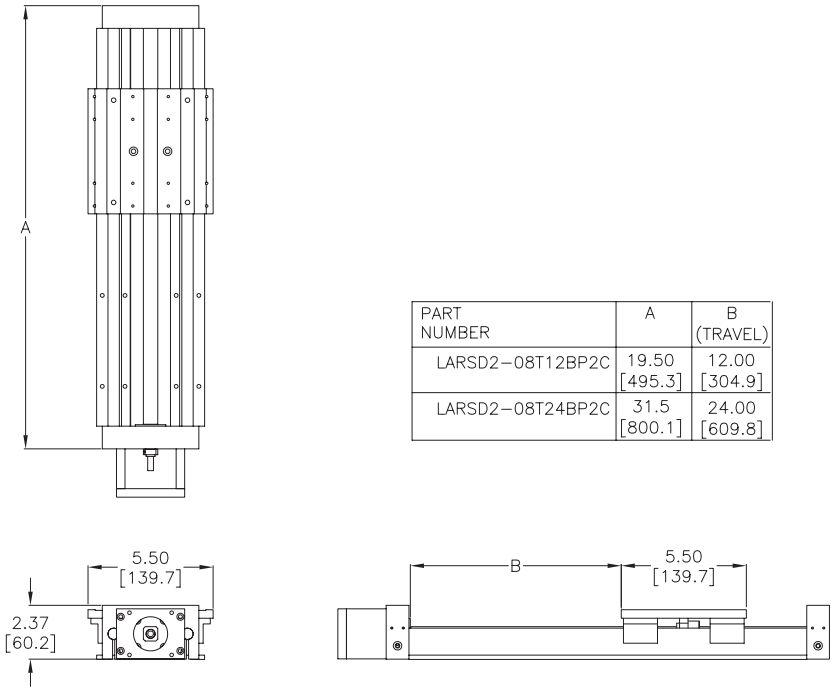
Load rating diagram

Twin Round Shaft Slide Actuator Load/Moment Ratings

Part Number	Load (lb)				Moment (lb·in)		
	Actuator Thrust	Normal – LN		Transverse	Roll	Pitch	Yaw
		Down	Up	LT	MR	MP	MY
LARSD2-08TxxBP2C	200	920	644	920	1046	1210	1730

Twin Round Shaft Slide Actuators

Dimensions (in [mm])



PART NUMBER	A	B (TRAVEL)
LARSD2–08T12BP2C	19.50 [495.3]	12.00 [304.9]
LARSD2–08T24BP2C	31.5 [800.1]	24.00 [609.8]

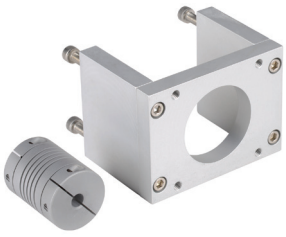
LARSD2-08TxxBP2C

See our website www.AutomationDirect.com for complete Engineering drawings.

Accessories

Twin Round Shaft Slide Actuator Accessories			
Part Number	***Price***	***Description***	***Weight (lb)***
LARSACC-010	$10ss:	SureMotion linear ball bushing, open type, 1/2 inch inside diameter, with seals, self-aligning.	0.5
LARSACC-013*	$;010s!:	SureMotion repair kit, for use with LARSD2-08T12BP2C actuators. Ballscrew, ballnut, end bearings and grease tube included.	3.0
LARSACC-014*	$010s?:	SureMotion repair kit, for use with LARSD2-08T24BP2C actuators. Ballscrew, ballnut, end bearings and grease tube included.	5.0
LARSACC-015*	$010sv:	SureMotion motor adapter, NEMA 23 frame. For use with LARSD2-08 series actuators. 1/4 x 1/4 inch coupler included.	1.0
LARSACC-016*	$010sx:	SureMotion motor adapter, NEMA 34 frame. For use with LARSD2-08 series actuators. 1/2 x 1/4 inch coupler included.	1.0

*** Repair kits and NEMA 23/34 motor adapter contain replacement components that are the same as the original components in the actuator assemblies.**



LARSACC-015(16)

LARSACC-013(014)

Some accessories not shown see www.AutomationDirect.com for additional product photos.

Compact Slide Actuators - Generation 2

LACP2-16T06LP5

Description

Self-contained linear actuator designed for light loads in a very small package. The base is a single piece design with integrated slide surfaces, and is hard anodized all over.

Generation 2 actuators have a reduced part count for more reliable operation, integral wireway through the body and more robust motor mount that fits both NEMA 17 and 23 motors.

Features

- Compact design
- Replacement components available
- Ready for NEMA 17 motor (NEMA 23 motor requires new coupling)
- End-of-travel switch mounts
- AISI 6061-T6 Aluminum Alloy base, Hard Anodized on all surfaces to a depth of 0.0005 to 0.0015"
- AISI 303 Stainless Steel Lead Screw

Applications

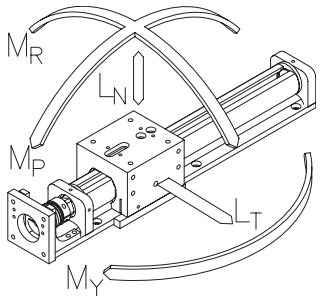
- Space-limiting applications
- Light loads
- Speeds up to 20 inches per second

Compact Slide Actuator Specifications

Part Number	Price	Drive Type	Drive Pitch	Drive Screw Efficiency (%)	Payload Inertia Factor (in2)	Constant System Inertia (lbm-in2)	Travel	Weight (lb)	Fits Motor
LACP2-16T06LP5	$;;001oa[:	Lead screw	0.5 in	52	0.0063	0.016	6in	1.8	NEMA 17
LACP2-16T12LP5	$;001oa_:					0.017	12in	2.3	
LACP2-16T24LP5	$;001oa#:					0.020	24in	3.5	
LACP2-16T36LP5	$;;001oa!:					0.024	36in	4.5	
LACP2-16T06L1	$;001oa?:		1in	44	0.025	0.022	6in	1.8	
LACP2-16T12L1	$;;001oa,:					0.023	12in	2.3	
LACP2-16T24L1	$;001ob0:					0.026	24in	3.5	
LACP2-16T36L1	$;001ob1:					0.030	36in	4.5	

System Inertia Calculation:

- To calculate the inertia reflected to the motor in a particular actuator, multiply the carriage payload by the payload inertia factor and then add the constant system inertia value for that actuator. The constant system inertia value for each system includes the inertia of the shaft coupler, carriage, and lead/ball screw.
- The payload must be in units of lb_m.



Load rating diagram

Compact Slide Actuator Load/Moment Ratings

Part Number	Load (lb)*				Moment (lb·in)**		
	Actuator Thrust	Normal – LN		Transverse	Roll	Pitch	Yaw
		Down	Up	LT	MR	MP	MY
LACP2-16TxxLP5	51	125	60	125	12	15	33
LACP2-16TxxL1	28	125	60	125	12	15	33

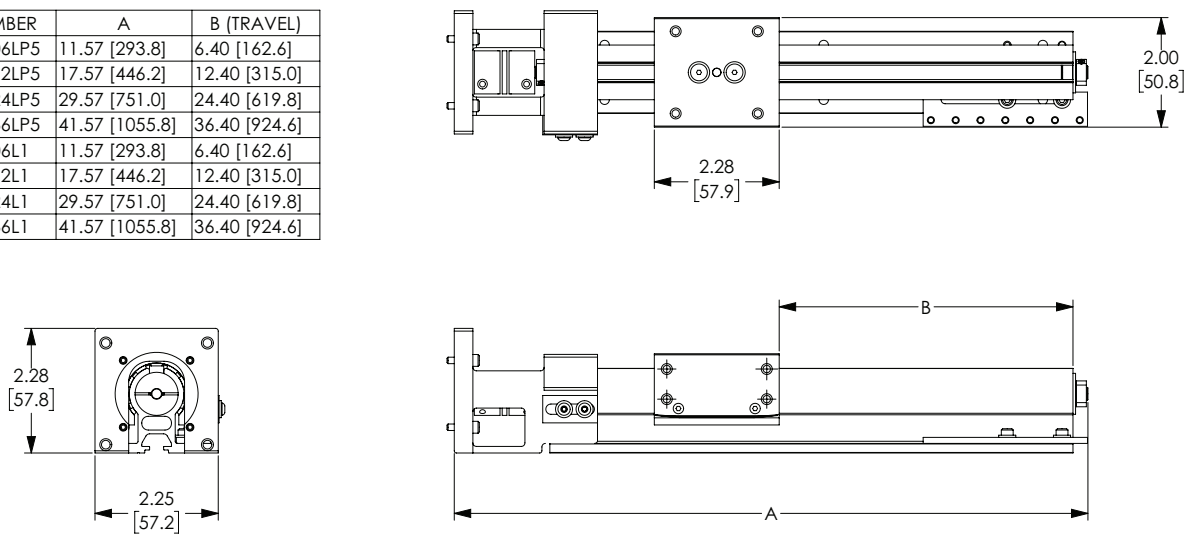
*** 30lb is the recommended maximum load capacity if the carriage is not externally supported against rolling. The higher load capacities are possible if the carriage is externally supported.**

**** It is recommended that offset loads be located 5 inches or less from the center of the carriage. When the loads are offset at greater distances, the carriage can vibrate during travel.**

Compact Slide Actuators - Generation 2

Dimensions (in [mm])

PART NUMBER	A	B (TRAVEL)
LACP2-16T06LP5	11.57 [293.8]	6.40 [162.6]
LACP2-16T12LP5	17.57 [446.2]	12.40 [315.0]
LACP2-16T24LP5	29.57 [751.0]	24.40 [619.8]
LACP2-16T36LP5	41.57 [1055.8]	36.40 [924.6]
LACP2-16T06L1	11.57 [293.8]	6.40 [162.6]
LACP2-16T12L1	17.57 [446.2]	12.40 [315.0]
LACP2-16T24L1	29.57 [751.0]	24.40 [619.8]
LACP2-16T36L1	41.57 [1055.8]	36.40 [924.6]



LACP2-16TxxLxx

See our website www.AutomationDirect.com for complete Engineering drawings.

Accessories

Compact Slide Actuator Accessories			
Part Number	***Price***	***Description***	***Weight (lb)***
LAVLACC-003*	$010sy:	SureMotion motor adapter, NEMA 23 frame. For use with LAVL2-60 series actuators. 1/4 inch x 5 mm coupler included.	1.0
LACPACC-0021	$;010t1:	SureMotion repair kit, for use with LACP-16TxxLP5 actuators. Nut, bushings, end bearings and oil syringe included.	0.5
LACPACC-0031	$;010t2:	SureMotion repair kit, for use with LACP-16TxxL1 actuators. Nut, bushings, end bearings and oil syringe included.	0.5
LACPACC-004	$10s_:	SureMotion mounting plate, XY type. For use with LACP2-16 series actuators.	0.5
LACPACC-005	$010s#:	SureMotion mounting plate, XY type. For use with LACP2-16 and LARSB1 series actuators.	0.5
LACPACC-0062	$01ob5:	SureMotion repair kit, for use with LACP2-16TxxLP5 actuators. Nut, bushings, end bearings and oil syringe included.	1.0
LACPACC-0072	$01ob6:	SureMotion repair kit, for use with LACP2-16TxxL1 actuators. Nut, bushings, end bearings and oil syringe included.	1.0

*** Use the coupling and motor mount screws from this kit to adapt any LACP2 actuator assembly to accept a NEMA 23 motor.**
[1] These repair kits contain parts to rebuild Generation 1 (LACP series) acutator assemblies.
[2] These repair kits contain parts to rebuilt current Generation 2 (LACP2 series) actuator assemblies.

LAVLACC-003

LACPACC-002(003)

LACPACC-004(005)

Some accessories not shown see www.AutomationDirect.com for additional product photos.

Value Linear Slide Actuators - Generation 2

LAVL2-60T06LP2

Description

Low-cost linear actuator using the latest in sliding element technology. The base is a single piece design with integrated slide surfaces, and is hard anodized all over. This versatile unit can be mounted horizontally, vertically, or inverted without loss of load capacity.

Generation 2 actuators have a reduced part count for more reliable operation, integral sensor mount grooves on both sides and a more robust motor mount.

Features

- Maintenance-free Rails and Rail Bushings
- Small footprint
- Adjustable carriage pre-load
- Replacement components available
- Ready for NEMA 17 motor
- T-slots enable limit switches to be positioned anywhere
- AISI 6061-T6 Aluminum Alloy base, hard anodized on all surfaces to a depth of 0.0005 to 0.0015"
- AISI 304 Stainless Steel Lead Screw
- Acetal NTA3 Lead Nut
- Drylin® Rail Bushings

Applications

- Harsh or wet environments
- X-Y-Z positioning systems

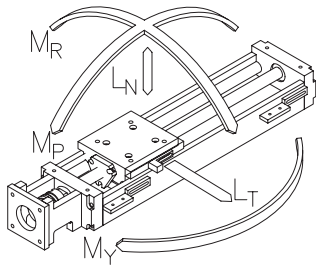
Value Linear Slide Actuator Specifications

Part Number	Price	Drive Type	Drive Pitch	Drive Screw Efficiency (%)	Payload Inertia Factor (in2)	Constant System Inertia (lbm-in2)	Travel	Weight (lb)	Fits Motor
LAVL2-60T06LP2	$;001oas:	Lead screw	0.2 in	47	0.001	0.017	6in	2.0	NEMA 17
LAVL2-60T12LP2	$;;001oat:					0.020	12in	2.8	
LAVL2-60T18LP2	$;001oau:					0.023	18in	3.5	
LAVL2-60T24LP2	$;001oav:					0.027	24in	4.2	
LAVL2-60T06LP5	$;001oax:		0.5 in	57	0.0063	0.019	6in	2.0	
LAVL2-60T12LP5	$;001oay:					0.022	12in	2.8	
LAVL2-60T18LP5	$;001oaz:					0.025	18in	3.5	
LAVL2-60T24LP5	$;;001oa]:					0.028	24in	4.2	

NOTE: The Lead Screw is lubricated at the factory with PTFE oil. It should be re-lubed peridocially. Rails and bushing lubrication not required.

System Inertia Calculation:

- To calculate the inertia reflected to the motor in a particular actuator, multiply the carriage payload by the payload inertia factor and then add the constant system inertia value for that actuator. The constant system inertia value for each system includes the inertia of the shaft coupler, carriage, and lead/ball screw.
- The payload must be in units of lb_m.



Load rating diagram

Value Linear Slide Actuator Load/Moment Ratings

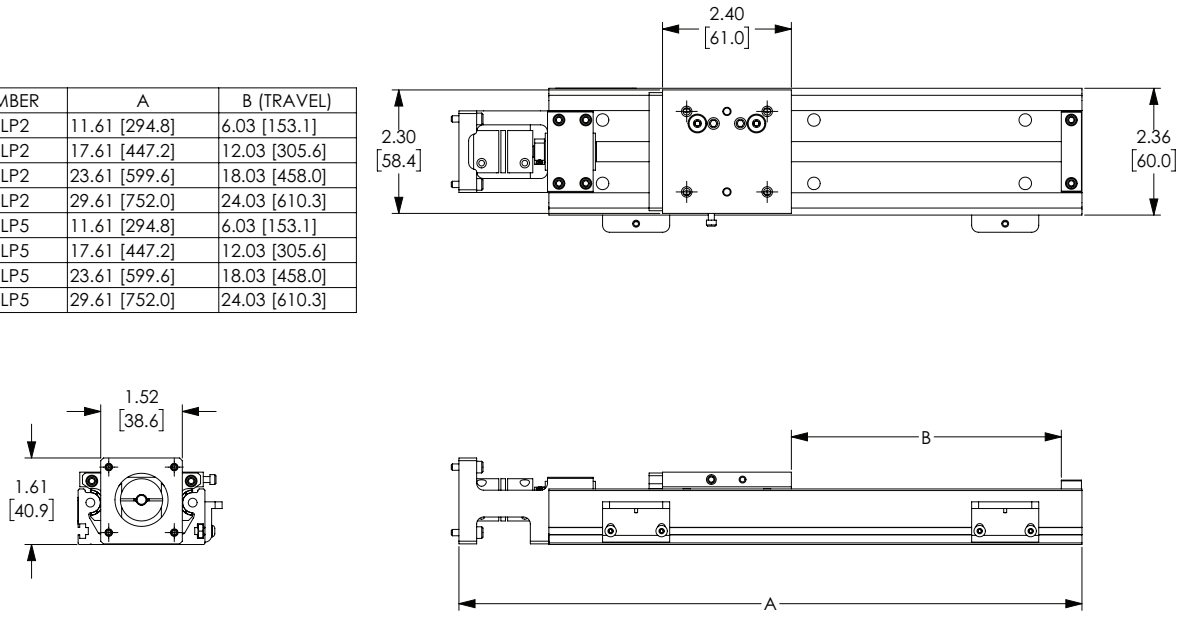
Part Number	Load (lb)				Moment (lb·in)*		
	Actuator Thrust	Normal – LN		Transverse	Roll	Pitch	Yaw
		Down	Up	LT	MR	MP	MY
LAVL2-60TxxLP2	70	110	110	110	50	32	32
LAVL2-60TxxLP5	50	110	110	110	50	32	32

* It is recommended that offset loads be located 5 inches or less from the center of the carriage. When the loads are offset at greater distances, the carriage can vibrate during travel.

Value Linear Slide Actuators - Generation 2

Dimensions (in [mm])

PART NUMBER	A	B (TRAVEL)
LAVL2-60T06LP2	11.61 [294.8]	6.03 [153.1]
LAVL2-60T12LP2	17.61 [447.2]	12.03 [305.6]
LAVL2-60T18LP2	23.61 [599.6]	18.03 [458.0]
LAVL2-60T24LP2	29.61 [752.0]	24.03 [610.3]
LAVL2-60T06LP5	11.61 [294.8]	6.03 [153.1]
LAVL2-60T12LP5	17.61 [447.2]	12.03 [305.6]
LAVL2-60T18LP5	23.61 [599.6]	18.03 [458.0]
LAVL2-60T24LP5	29.61 [752.0]	24.03 [610.3]



LAVL2-60TxxLPx

See our website www.AutomationDirect.com for complete Engineering drawings.

Accessories

Value Linear Slide Actuator Accessories			
Part Number	***Price***	***Description***	***Weight (lb)***
LAVLACC-001*	$;010s,:	SureMotion repair kit, for use with LAVL-60TxxLP2 actuators. Nut, bushings, end bearings and oil syringe included.	0.5
LAVLACC-002*	$;010t0:	SureMotion repair kit, for use with LAVL-60TxxLP5 actuators. Nut, bushings, end bearings and oil syringe included.	0.5
LAVLACC-003	$010sy:	SureMotion motor adapter, NEMA 23 frame. For use with LAVL2-60 series actuators. 1/4 inch x 5 mm coupler included.	1.0
LAVLACC-004	$;010s]:	SureMotion mounting plate, XY type. For use with LAVL2-60 series actuators.	0.5
LAVLACC-005	$;010s[:	SureMotion mounting plate, XZ type. For use with LAVL2-60 series actuators.	1.0
LAVLACC-006*	$01ob3:	SureMotion repair kit, for use with LAVL2-60TxxLP2 actuators. Nut, bushings, end bearings and oil syringe included.	1.0
LAVLACC-007*	$01ob4:	SureMotion repair kit, for use with LAVL2-60TxxLP5 actuators. Nut, bushings, end bearings and oil syringe included.	1.0

*** Repair kits contain replacement components that are the same as the original components in the actuator assemblies.**

LAVLACC-003

LAVLACC-001(002)

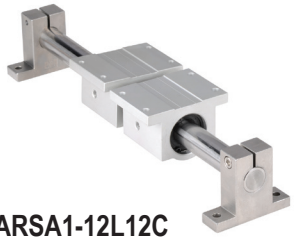
LAVLACC-004

LAVLACC-005

Some accessories not shown see www.AutomationDirect.com for additional product photos.

Linear Motion Products

Round-Shaft Slide Elements



LARSA1-12L12C

LARSB1-12L12C

Description

Round-shaft sliding elements can be combined with other elements to build a huge variety of machine mechanisms. Available in both end- and continuously-supported shafts.

Features

- Linear ball bearings
- High quality clear anodized aluminum blocks
- AISI 1566 Carbon Steel, 60 RC Round Shafts

NOTE: Pillow blocks are shipped without lubrication and should be lubricated prior to use. A lubrication port is available.

Slide Rail Systems Load Ratings

Part Number	Normal (lb)		Transverse (lb)
	Down	Up	
Pillow Blocks / Bushings for LARSA1			
LARSACC-001/007	230		
LARSACC-002/008	470		
LARSACC-003/009	850		
LARSA1 Linear Slide Assemblies			
LARSA1-08LxxC	460		
LARSA1-12LxxC	940		
LARSA1-16LxxC	1700		
Pillow Blocks / Bushings for LARSB1			
LARSACC-004/010	230	161	230
LARSACC-005/011	470	268	470
LARSACC-006/012	850	485	850
LARSB1 Linear Slide Assemblies			
LARSB1-08LxxC	460	322	460
LARSB1-12LxxC	940	536	940
LARSB1-16LxxC	1700	970	1700

End-Supported Slide Rail Systems

Part Number	Price	Shaft Diameter	Overall Length (in)	Weight (lb)
LARSA1-08L12C	$-010io:	1/2	12	1.5
LARSA1-08L24C	$-010ip:	1/2	24	2.0
LARSA1-08L36C	$-010iq:	1/2	36	2.7
LARSA1-12L12C	$-010is:	3/4	12	3.0
LARSA1-12L24C	$;-010it:	3/4	24	4.5
LARSA1-12L36C	$-010iu:	3/4	36	6.0
LARSA1-16L12C	$-010iv:	1	12	6.0
LARSA1-16L24C	$-010ix:	1	24	8.5
LARSA1-16L36C	$-010iy:	1	36	11.0

(2) single pillow blocks included
*** Bushings and pillow blocks are replacement components that are the same as the original components in the slide assemblies.**

Closed Type Pillow Blocks and Bushings

Part Number	Price	Fits Shaft Diameter (in)	Weight (lb)	Image
LARSACC-001	$;10t3:	1/2	0.3	
LARSACC-002	$;10t4:	3/4	0.6	
LARSACC-003	$;010t5:	1	1.2	
LARSACC-007	$10so:	1/2	0.1	
LARSACC-008	$10sp:	3/4	0.2	
LARSACC-009	$10sq:	1	0.3	

Continuously-Supported Slide Rail Systems

Part Number	Price	Shaft Diameter	Overall Length (in)	Weight (lb)
LARSB1-08L12C	$-010iz:	1/2	12	2.0
LARSB1-08L24C	$;-010i]:	1/2	24	3.0
LARSB1-08L36C	$;-010i[:	1/2	36	4.5
LARSB1-12L12C	$-010i_:	3/4	12	4.0
LARSB1-12L24C	$-010i#:	3/4	24	6.2
LARSB1-12L36C	$;-010i!:	3/4	36	9.0
LARSB1-16L12C	$-010i?:	1	12	6.5
LARSB1-16L24C	$;-010i,:	1	24	10.5
LARSB1-16L36C	$-010j0:	1	36	14.5

(2) single pillow blocks included
*** Bushings and pillow blocks are replacement components that are the same as the original components in the slide assemblies.**

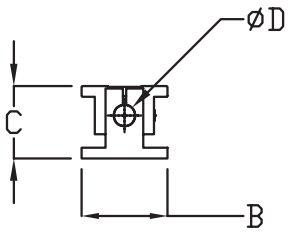
Open Type Pillow Blocks and Bushings

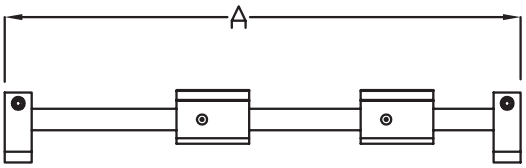
Part Number	Price	Fits Shaft Diameter (in)	Weight (lb)	Image
LARSACC-004*	$;10t6:	1/2	0.3	
LARSACC-005*	$;10t7:	3/4	0.6	
LARSACC-006*	$;010t8:	1	1.2	
LARSACC-010	$10ss:	1/2	0.1	
LARSACC-011	$;10st:	3/4	0.2	
LARSACC-012	$10su:	1	0.3	

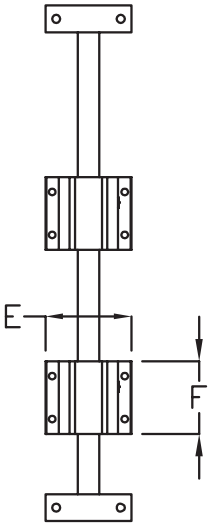
***Preload Adjustment available**

Round-Shaft Slide Elements

Dimensions (in [mm])







LARSA1-xxLxxC & LARSB1-xxLxxC*

PART #	A	B	C	ØD	E	F
LARSA1-08L12C	12.0 [304.8]	2.00 [50.8]	1.70 [42.9]	0.50 [12.7]	2.00 [50.8]	1.69 [42.9]
LARSA1-08L24C	24.0 [609.6]					
LARSA1-08L36C	36.0 [914.4]					
LARSA1-12L12C	12.0 [304.8]	2.50 [63.5]	2.19 [55.6]	0.75 [19.0]	2.75 [69.9]	2.06 [52.4]
LARSA1-12L24C	24.0 [609.6]					
LARSA1-12L36C	36.0 [914.4]					
LARSA1-16L12C	12.0 [304.8]	3.06 [77.8]	2.69 [68.3]	1.00 [25.4]	3.25 [82.6]	2.81 [71.5]
LARSA1-16L24C	24.0 [609.6]					
LARSA1-16L36C	36.0 [914.4]					
LARSB1-08L12C	12.0 [304.8]	1.50 [38.1]	1.81 [46.0]	0.50 [12.7]	2.00 [50.8]	1.50 [38.1]
LARSB1-08L24C	24.0 [609.6]					
LARSB1-08L36C	36.0 [914.4]					
LARSB1-12L12C	12.0 [304.8]	1.75 [44.5]	2.44 [61.9]	0.75 [19.0]	2.75 [69.9]	1.88 [47.6]
LARSB1-12L24C	24.0 [609.6]					
LARSB1-12L36C	36.0 [914.4]					
LARSB1-16L12C	12.0 [304.8]	2.13 [54.0]	2.94 [74.6]	1.00 [25.4]	3.25 [82.6]	2.63 [66.7]
LARSB1-16L24C	24.0 [609.6]					
LARSB1-16L36C	36.0 [914.4]					

***LARSA1-xxLxxC is shown in drawing. LARSB1-xxLxxC has different appearance, but same dimensions as shown in this table.**

See our website www.AutomationDirect.com for complete Engineering drawings.

Precision Ground Linear Shafts

1060 Steel and 440C Stainless Steel

Features

- C1060 steel
- RC60-65 Hardness
- 10RMS Surface Finish
- Tolerance: Class L
  ± 1/32" length tolerance
  + 0.0000" / - 0.0005" diameter tolerance

Linear Shafts - 1060 Steel				
Part Number	*A*	*ØB*	*Price*	*Weight (lb)*
LPCS08-12	12.0	0.50	Retired	0.71
LPCS08-24	24.0	0.50	Retired	2.41
LPCS08-36	36.0	0.50	Retired	3.41
LPCS12-12	12.0	0.75	Retired	1.52
LPCS12-24	24.0	0.75	Retired	4.03
LPCS12-36	36.0	0.75	Retired	5.84
LPCS16-12	12.0	1.0	Retired	2.71
LPCS16-24	24.0	1.0	Retired	6.41
LPCS16-36	36.0	1.0	Retired	9.41

Note: All measurements in inches

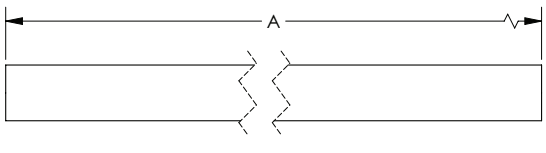
Features

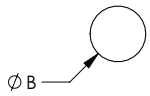
- 440C Stainless steel
- RC50-55 Hardness
- 10RMS Surface Finish
- Tolerance: Class L
  ± 1/32" length tolerance
  + 0.0000" / - 0.0005" diameter tolerance

Linear Shafts - 440C Stainless Steel				
Part Number	*A*	*ØB*	*Price*	*Weight (lb)*
LPSS08-12	12.0	0.50	Retired	0.71
LPSS08-24	24.0	0.50	Retired	2.41
LPSS08-36	36.0	0.50	Retired	3.41
LPSS12-12	12.0	0.75	Retired	1.52
LPSS12-24	24.0	0.75	Retired	4.03
LPSS12-36	36.0	0.75	Retired	5.84
LPSS16-12	12.0	1.0	Retired	2.71
LPSS16-24	24.0	1.0	Retired	6.41
LPSS16-36	36.0	1.0	Retired	9.41

Note: All measurements in inches

Dimensions





See our website www.AutomationDirect.com for complete Engineering drawings.

SureMotion® Linear Guides LV Series

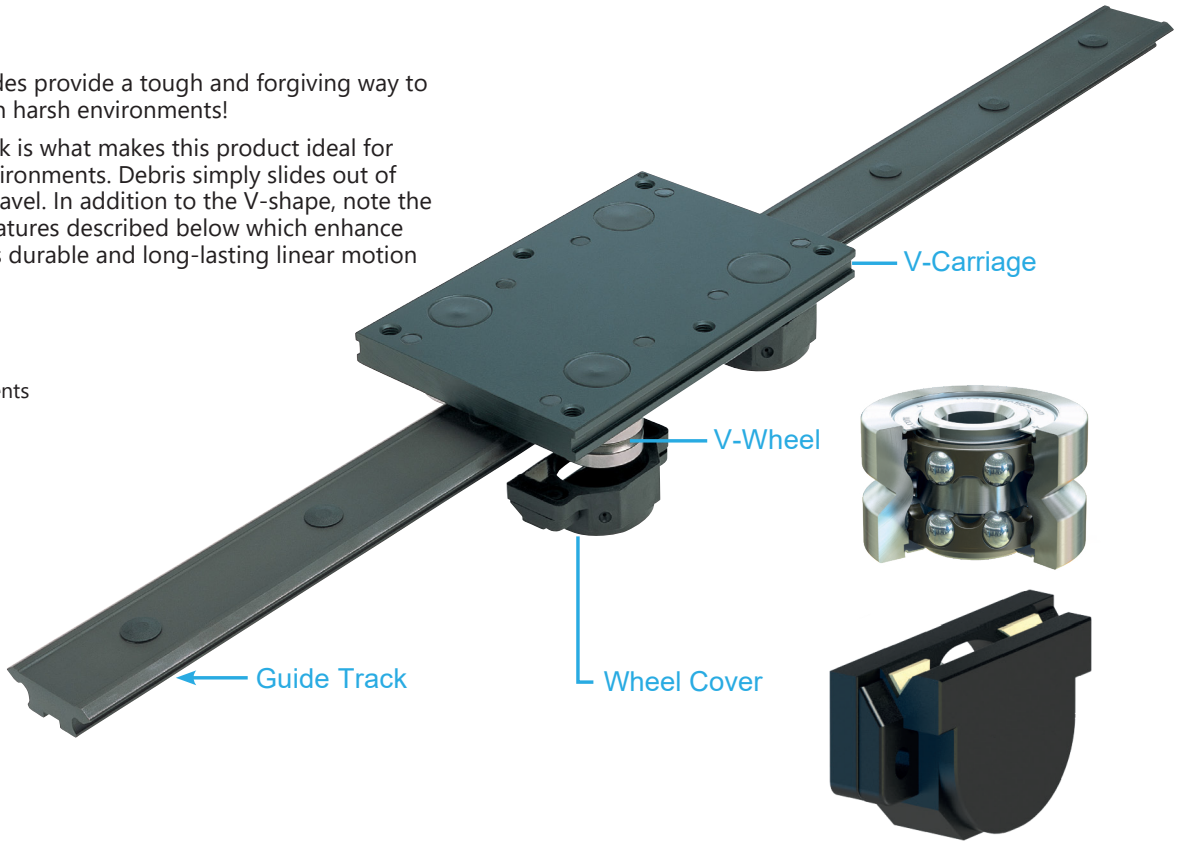
Overview

SureMotion Linear Guides provide a tough and forgiving way to achieve linear motion in harsh environments!

The V-shape guide track is what makes this product ideal for use in heavy debris environments. Debris simply slides out of the way during linear travel. In addition to the V-shape, note the carefully engineered features described below which enhance the effectiveness of this durable and long-lasting linear motion solution.

Applications

- Dirty, dusty environements



V-Carriage

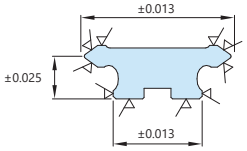
- Three sizes available
- Two concentric V-wheels
- Two adjustable eccentric V-wheels
- Four pre-lubricated wheel covers
- Speed rating: 8m/s
- Material: High-strength aluminum alloy
- Finish: Black anodized
- Plastic hole covers included

V-Wheel

- 70° V groove
- Double-row ball bearings
- Sealed
- V groove & raceways: Carbon-chromium bearing steel AISI 52100, hardened and tempered.
- Balls: Carbon-chromium bearing steel AISI 52100, hardened and tempered.
- Cage: Plastic
- Shield: Nitrile rubbber
- Mounting studs: High tensile steel with tensile strength = 695 N/mm^2.
- Temperature Range: -200°C to +1200°C
- Lifetime lubricated!

Guide Track

- Three sizes available matching the three V-Carriages offered
- Lengths up to 1256mm
- Double 70° V groove
- Precision Ground surfaces
- Material: High-carbon bearing steel AISI 52100
- Hardness: V-surface case hardened to 58-62 Rockwell C scale
- Finish: Chemical black
- Plastic hole covers included



√ Indicates precision ground surfaces

Wheel Cover

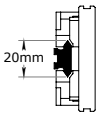
- Provides constant lubrication to the guide track
- End Seals: Felt
- Housing: Thermoplastic elastomer
- Temperature Range: -200°C to +600°C
- Lubrication: Preloaded with NLGI #2 grease

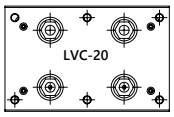
SureMotion® Linear Guides LV Series

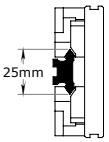
LVC Series V-Carriage

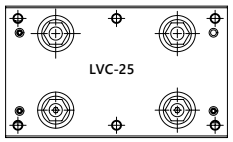
Part Number	Price	Size	Static (Co)	Lateral (Lt)	Pitch Moment (Mp)	Yaw Moment (My)	Roll Moment (Mr)	Required Adjustment Tool	Price	Drawing Link
LVC-20	$0676q:	20	435 N	685 N	12 N·m	19 N·m	4 N·m	LVCACC-1	$676n:	PDF
LVC-25	$0676s:	25	800 N	1500 N	30 N·m	56 N·m	9 N·m	LVCACC-2	$676o:	PDF
LVC-44	$;0676t:	44	2800 N	4700 N	146 N·m	243 N·m	57 N·m	LVCACC-3	$676p:	PDF

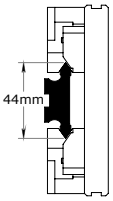
Note: Eight (8) small and four (4) large plastic caps included.

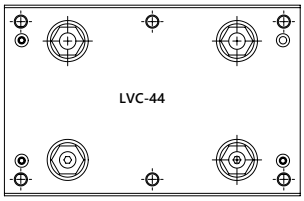




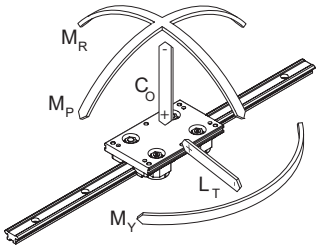








NOTES:
1. Load ratings are base on lubricated V-contact surfaces.
2. V-Carriages are supplied with LOOSE Eccentric wheels and must be adjusted to design conditions prior to operation. Adjustment Tool LVCACC-x is required for this adjustment



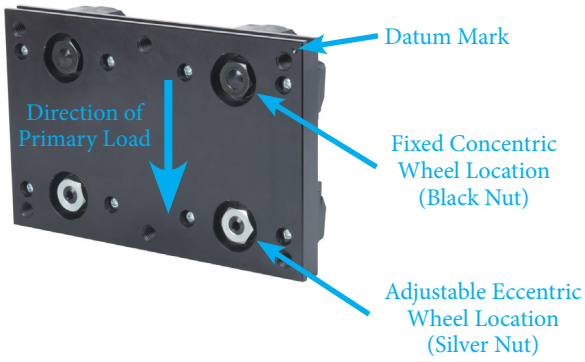
Coefficient of rolling friction = 0.02

Additional friction force from wheel cover wipers:

LVC-20 = 4N

LVC-25 = 7N

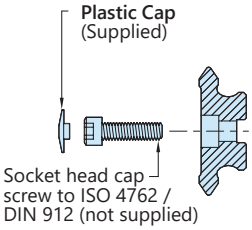
LVC-44 =15N



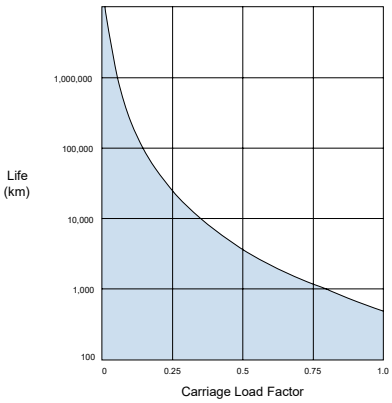
LVR Series Guide Track

Part Number	Price	Size	Length (mm)	Drawing Links
LVR-20-266	$6776:	20	266	PDF
LVR-20-536	$06777:		536	PDF
LVR-20-716	$06778:		716	PDF
LVR-20-1076	$06779:		1076	PDF
LVR-25-536	$0677a:	25	536	PDF
LVR-25-716	$0677b:		716	PDF
LVR-25-1076	$0677c:		1076	PDF
LVR-25-1256	$0677d:		1256	PDF
LVR-44-536	$0677e:	44	536	PDF
LVR-44-716	$;0677f:		716	PDF
LVR-44-1076	$0677g:		1076	PDF
LVR-44-1256	$06a7y:		1256	PDF

Note: Mounting screws not included, plastic caps for mounting holes are included.



$$\text{Carriage Load Factor} = \frac{\text{Applied Load}}{\text{Carriage Rating}} = \frac{\text{Applied } C_o}{C_o} + \frac{\text{Applied } L_t}{L_t} + \frac{\text{Applied } M_r}{M_r} + \frac{\text{Applied } M_y}{M_y} + \frac{\text{Applied } M_p}{M_p}$$

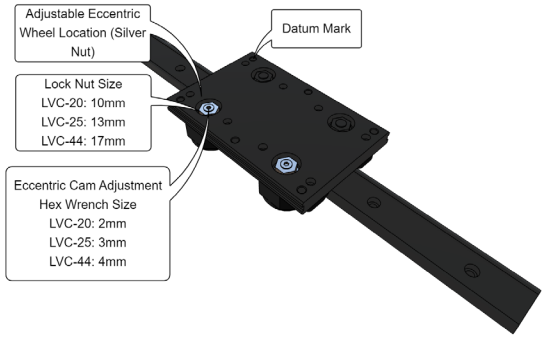


SureMotion® Linear Guides LV Series

Preloading and Adjustment

Step 1

Remove the two wheel covers. Using a socket wrench, loosen the two eccentric wheel lock nuts counterclockwise.

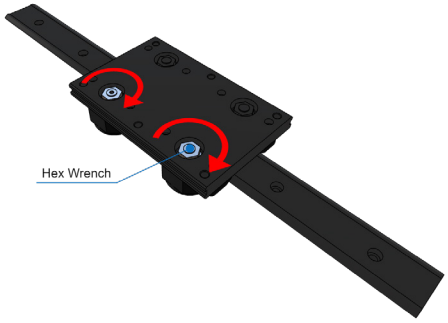


Step 2

Using the adjustment tool, rotate the two eccentric cam assemblies counterclockwise so the guide track will easily slide in. Then slide the carriage onto the guide track.

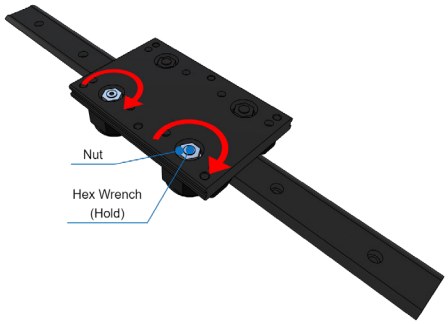
Step 3

Using the adjustment tool, slowly rotate the eccentric cam assembly clockwise until a slight resistance is felt. This indicates that the v wheel is contacting the guide track.



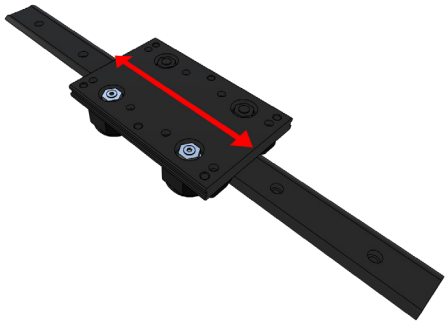
Step 4

Hold the adjustment tool in place while rotating the lock nut clockwise until it is snug. Repeat for the second eccentric wheel assembly.



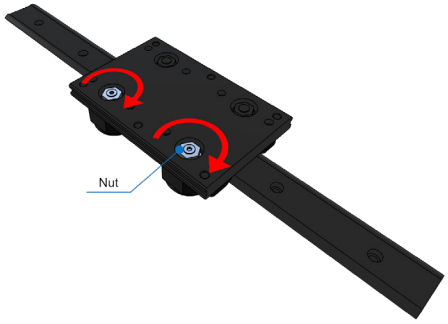
Step 5

Manually slide the carriage along the entire length of the guide track to determine if there are any noticeable rolling resistance variations or undesired carriage wiggle. If so, repeat steps 2-5.



Step 6

Hold the eccentric wheel in position with the adjustment tool while fully tightening the lock nut. Do both eccentric wheels. Remove the carriage from the rail. Reinstall the wheel covers. Reinstall the carriage to the rail.

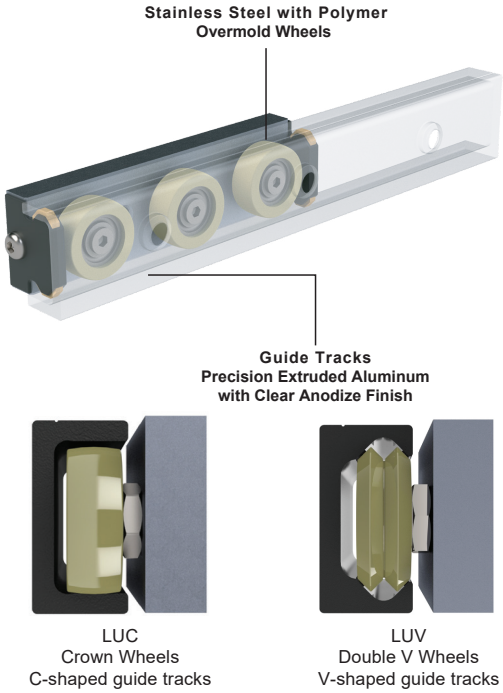


SureMotion® Linear Guides LU Series

Overview

Tough, forgiving and CLEAN Linear Motion!

The the crowned or double-V wheel shape feature, along with NO lubrication requirement, makes this product ideal for applications where there is process debris but no foreign mechanism oils are allowed. The Guide Tracks and Carriages come in two styles (LUC & LUV) and are intended to work in tandem with each other for better forgiveness when used in unaligned frames and components. See the full list of engineered features below.



Features

Carriages

- Available in three sizes that match Guide Track sizes
- Available with two wheel shapes: Crown (C) or Double-V (V)
- Available with three, four, or five wheels
- All carriages have one or two adjustable eccentric wheel(s)
- All have felt wiper ends
- Carriage Plate Material: Aluminum with anodize finish
- Wheel Bearings: Single row ball, shielded
- Wheel Bearing Grease: Kluberplex BEM034-132
- Wheel Hub Material: 440C stainless steel
- Wheel Tread: Polymer, over-molded
- Rated Speed: 1 m/s

Guide Tracks

- Available in three sizes that match carriage sizes
- Available in two cross-sectional shapes C or V
- Lengths up to 1520mm
- Can be butted end-to-end for longer travel
- Material: Aluminum with anodized finish

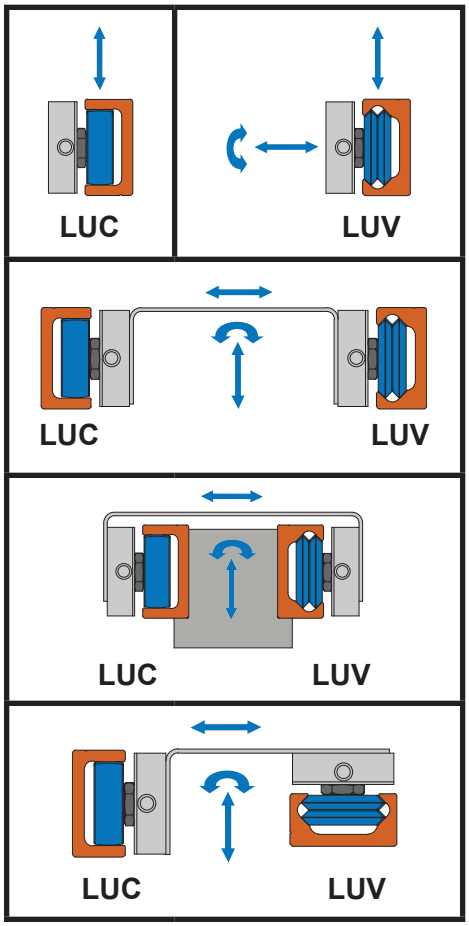
Applications

- Food processing
- Paper processing
- Fabric processing
- Clean room processes

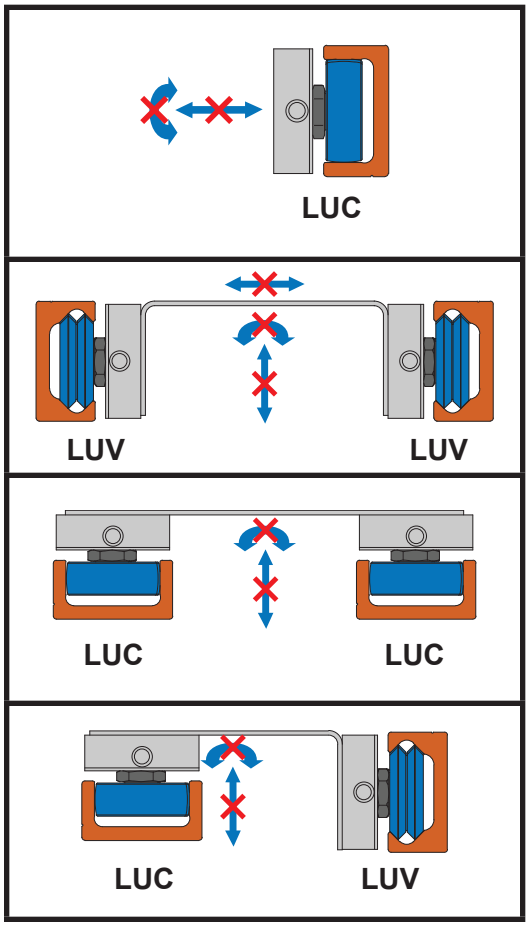
Range of Angular Misalignment

Series Size	LUC	LUV
0	±3°	0°
1	±4°	
2	±6°	

Recommended Applied Load Directions



Not Recommended Applied Load Directions



SureMotion® Linear Guides
LUC Series (Crown Wheel)

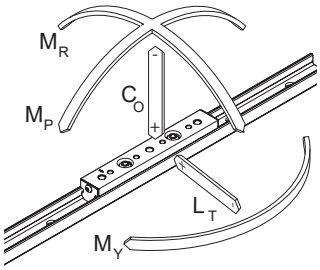
LUC-0-3W

LUC-0-4W

LUC-0-5W

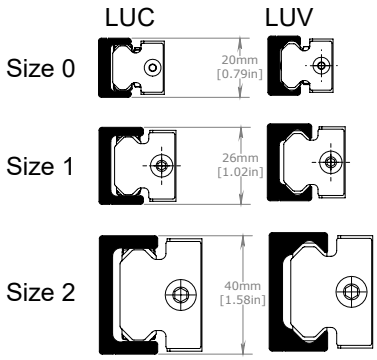
LUC Series Crown Carriage

Part Number	Price	Size	Wheel Count	Static (Co)	Lateral (Lt)	Pitch Moment (Mp)	Yaw Moment (My)	Roll Moment (Mr)	Required Adjustment Tool	Price	Drawing Link
LUC-0-3W	$;0676!:	0	3	0 N	53 N	0 N·m	0.6 N·m	0 N·m	LUACC-0	$6apo:	PDF
LUC-0-4W	$0676?:		4		53 N		1.8 N·m				PDF
LUC-0-5W	$;0676,:		5		63 N		1.8 N·m				PDF
LUC-1-3W	$06770:	1	3		107 N		2 N·m		LUACC-1	$6app:	PDF
LUC-1-4W	$06771:		4		107 N		5.1 N·m				PDF
LUC-1-5W	$06772:		5		127 N		5.1 N·m				PDF
LUC-2-3W	$06773:	2	3		142 N		3.2 N·m		LUACC-2	$6apq:	PDF
LUC-2-4W	$06774:		4		142 N		9.3 N·m				PDF
LUC-2-5W	$06775:		5		169 N		9.3 N·m				PDF



LUC-1-480 Track
LUC-1-4W Carriage

LU Series relative sizes



LUC Series Guide Track

Part Number	Price	Size	Length (mm [in])	Drawing Links
LUC-0-480	$;677,:	0	480 [18.9]	PDF
LUC-0-640	$6780:		640 [25.2]	PDF
LUC-0-800	$6781:		800 [31.5]	PDF
LUC-0-960	$6782:		960 [37.8]	PDF
LUC-0-1120	$6783:		1120 [44.1]	PDF
LUC-0-1280	$6784:		1280 [50.4]	PDF
LUC-0-1520	$6785:		1520 [59.8]	PDF
LUC-1-480	$6786:	1	480 [18.9]	PDF
LUC-1-640	$6787:		640 [25.2]	PDF
LUC-1-800	$6788:		800 [31.5]	PDF
LUC-1-960	$6789:		960 [37.8]	PDF
LUC-1-1120	$678a:		1120 [44.1]	PDF
LUC-1-1280	$678b:		1280 [50.4]	PDF
LUC-1-1520	$678c:		1520 [59.8]	PDF
LUC-2-480	$678d:	2	480 [18.9]	PDF
LUC-2-640	$678e:		640 [25.2]	PDF
LUC-2-800	$;678f:		800 [31.5]	PDF
LUC-2-960	$678g:		960 [37.8]	PDF
LUC-2-1120	$678h:		1120 [44.1]	PDF
LUC-2-1280	$-678i:		1280 [50.4]	PDF
LUC-2-1520	$-0678j:		1520 [59.8]	PDF

SureMotion® Linear Guides
LUV Series (Double V Wheel)

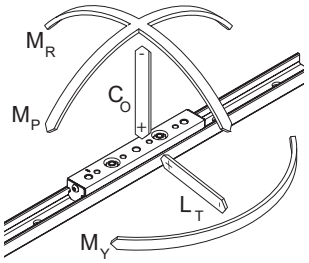
LUV-0-3W

LUV-0-4W

LUV-0-5W

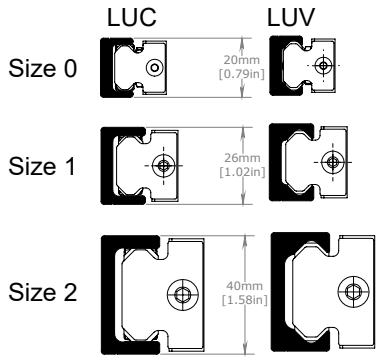
LUV Series V-Carriage

Part Number	Price	Size	Wheel Count	Static (Co)	Lateral (Lt)	Pitch Moment (Mp)	Yaw Moment (My)	Roll Moment (Mr)	Required Adjustment Tool	Price	Drawing Link
LUV-0-3W	$0676u:	0	3	38 N	53 N	0.6 N·m	0.6 N·m	0.2 N·m	LUACC-0	$6apo:	PDF
LUV-0-4W	$0676v:		4	46 N	53 N	21.1 N·m	1.8 N·m	0.4 N·m			PDF
LUV-0-5W	$0676x:		5	54 N	63 N	21.1 N·m	1.8 N·m	0.4 N·m			PDF
LUV-1-3W	$0676y:	1	3	76 N	107 N	2 N·m	2 N·m	0.5 N·m	LUACC-1	$6app:	PDF
LUV-1-4W	$0676z:		4	91 N	107 N	61.5 N·m	5.1 N·m	1 N·m			PDF
LUV-1-5W	$;0676]:		5	107 N	127 N	61.5 N·m	5.1 N·m	1 N·m			PDF
LUV-2-3W	$;0676[:	2	3	94 N	142 N	3.6 N·m	3.2 N·m	1.2 N·m	LUACC-2	$6apq:	PDF
LUV-2-4W	$0676_:		4	116 N	142 N	124.9 N·m	9.3 N·m	2.3 N·m			PDF
LUV-2-5W	$0676#:		5	133 N	169 N	124.9 N·m	9.3 N·m	2.3 N·m			PDF



LUV-1-480 Track
LUV-1-4W Carriage

LU Series relative sizes

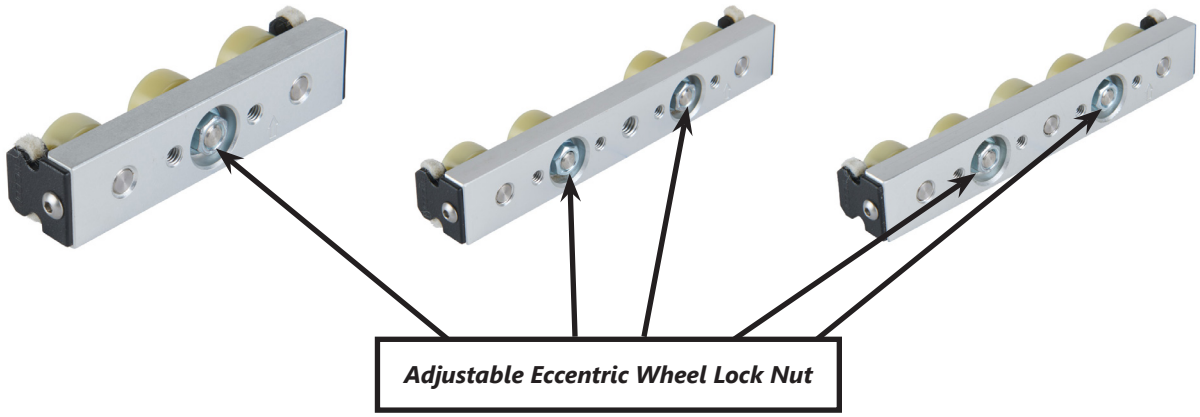


LUV Series Guide Track

Part Number	Price	Size	Length (mm [in])	Drawing Links
LUV-0-480	$-677i:	0	480 [18.9]	PDF
LUV-0-640	$-677j:		640 [25.2]	PDF
LUV-0-800	$677k:		800 [31.5]	PDF
LUV-0-960	$-677l:		960 [37.8]	PDF
LUV-0-1120	$677n:		1120 [44.1]	PDF
LUV-0-1280	$677o:		1280 [50.4]	PDF
LUV-0-1520	$677p:		1520 [59.8]	PDF
LUV-1-480	$677q:	1	480 [18.9]	PDF
LUV-1-640	$677s:		640 [25.2]	PDF
LUV-1-800	$;677t:		800 [31.5]	PDF
LUV-1-960	$677u:		960 [37.8]	PDF
LUV-1-1120	$677v:		1120 [44.1]	PDF
LUV-1-1280	$677x:		1280 [50.4]	PDF
LUV-1-1520	$677y:		1520 [59.8]	PDF
LUV-2-480	$677z:	2	480 [18.9]	PDF
LUV-2-640	$;677]:		640 [25.2]	PDF
LUV-2-800	$;677[:		800 [31.5]	PDF
LUV-2-960	$677_:		960 [37.8]	PDF
LUV-2-1120	$677#:		1120 [44.1]	PDF
LUV-2-1280	$;677!:		1280 [50.4]	PDF
LUV-2-1520	$0677?:		1520 [59.8]	PDF

SureMotion® Linear Guides LUC and LUV Series

Preloading and Adjustment

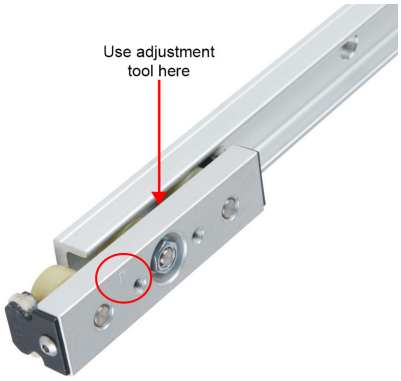


Step 1

Using a socket wrench, loosen the adjustable eccentric wheel lock nut counterclockwise

Step 2

Install the carriage into the guide track with the embossed arrow pointing in the same direction as the primary load. Using the adjusting tool, slowly turn the eccentric cam nut clockwise until a slight resistance is felt. This indicates wheel contact with the track.



NOTE: Adjustment tool LUACC-x (shown above) is required for this adjustment. See carriage chart for sizing.

Step 3

Using the adjustment tool to hold the eccentric cam nut in place, use the socket wrench to slight tighten the adjustable eccentric wheel lock nut (clockwise).

Step 4

Manually move the carriage along the entire length of the guide track to determine whether there are any noticable resistance variations. If so, repeat 1-3

Step 5

Using the adjustment tool to hold the eccentric cam nut in place, use the socket wrench to fully tighten the adjustable eccentric wheel lock nut (clockwise).

iglide® Plastic Plain Bearings

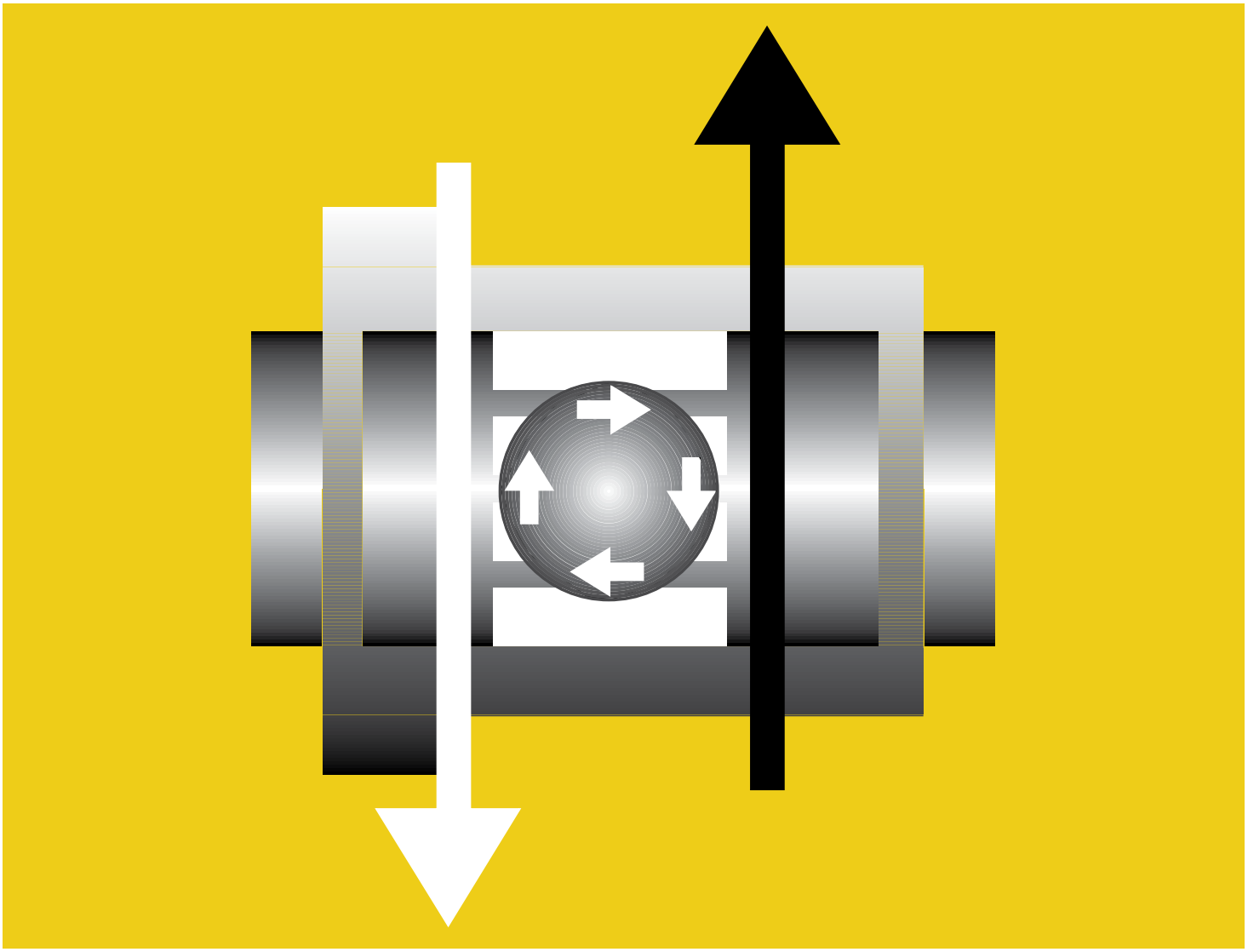
igus® iglide® plastic bearings are economical, dry-running and maintenance-free. Offered in three of the most popular materials with or without flanges, these plain bearings are an excellent choice for a wide range of motion applications.

Features

- 3 popular materials - J (low friction), G300 (general purpose), T500 (high temp)
- Sleeve and flange bearings
- Fits shafts from 1/4" to 1"
- Good chemical resistance
- Link to selection guide materials

CE

igus® iglide® Plain Bearings									
Item Photo	Part Number	Material	Size I.D. (inch)	Size O.D. (inch)	Flange	Qty. per Package	Weight (lb)	Price	Drawing Link
	A-JSI-0406-04	J	1/4	3/8	No	10	0.19	$2a6b:	PDF
	A-JSI-0810-08		1/2	5/8		10	0.04	$2a6c:	PDF
	A-JSI-1214-12		3/4	7/8		5	0.03	$2a6d:	PDF
	A-JSI-1618-16		1	1-1/8		2	0.44	$2a6e:	PDF
	A-JFI-0406-04		1/4	3/8	Yes	10	0.02	$;2a6f:	PDF
	A-JFI-0810-08		1/2	5/8		10	0.49	$2a66:	PDF
	A-JFI-1214-12		3/4	7/8		5	0.49	$2a67:	PDF
	A-JFI-1618-16		1	1-1/8		2	0.04	$2a68:	PDF
	A-GSI-0405-04	G300	1/4	5/16	No	10	0.02	$2a69:	PDF
	A-GSI-0809-08		1/2	9/16		10	0.03	$2a6a:	PDF
	A-GSI-1214-12		3/4	7/8		5	0.04	$2a6g:	PDF
	A-GSI-1618-16		1	1-1/8		2	0.04	$2a6h:	PDF
	A-GFI-0405-04		1/4	5/16	Yes	10	0.02	$-2a6i:	PDF
	A-GFI-0809-08		1/2	9/16		10	0.04	$-2a6j:	PDF
	A-GFI-1214-12		3/4	7/8		5	0.05	$2a6k:	PDF
	A-GFI-1618-16		1	1-1/8		2	0.03	$-2a6l:	PDF
	A-TSI-0405-04	T500	1/4	5/16	No	5	0.02	$2a6n:	PDF
	A-TSI-0809-08		1/2	9/16		5	0.02	$2a6o:	PDF
	A-TSI-1214-12		3/4	7/8		2	0.03	$2a6p:	PDF
	A-TSI-1618-16		1	1-1/8		2	0.03	$2a6q:	PDF
	A-TFI-0405-04		1/4	5/16	Yes	5	0.01	$2a6s:	PDF
	A-TFI-0809-08		1/2	9/16		5	0.02	$;2a6t:	PDF
	A-TFI-1214-12		3/4	7/8		2	0.02	$2a6u:	PDF
	A-TFI-1618-16		1	1-1/8		2	0.04	$2a6v:	PDF

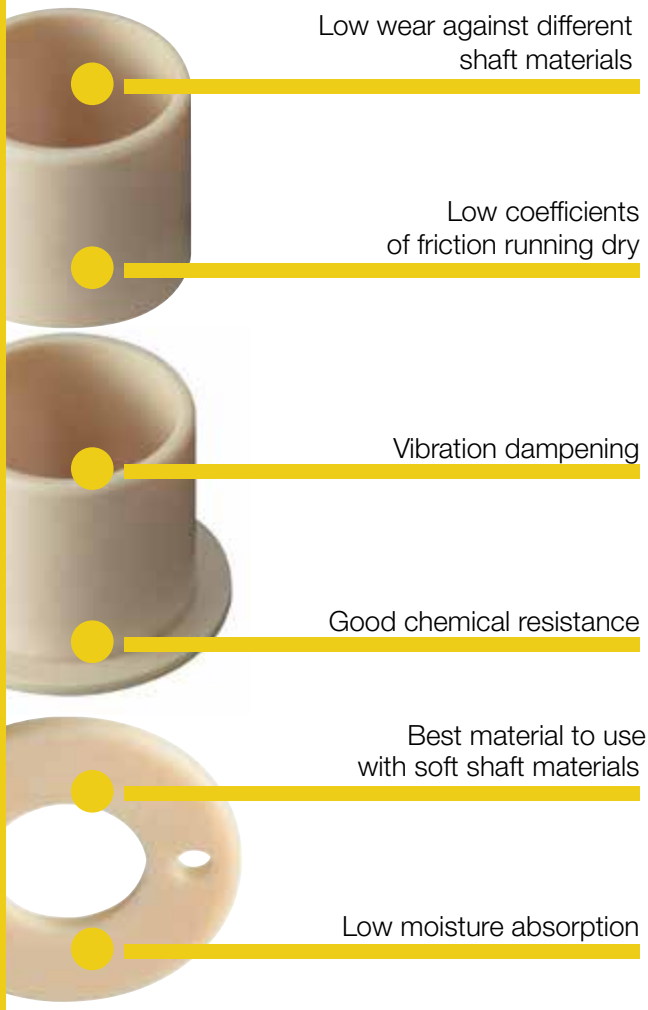


iglide® J

- Low wear against different shaft materials
- Low coefficients of friction running dry
- Vibration dampening
- Good chemical resistance
- Low moisture absorption

iglide® J - The fast and slow motion specialist

Low friction, low wear



The iglide® J plain bearings are designed for the lowest coefficients of friction while running dry and their low stick-slip tendency. With a maximum permissible surface pressure of 5,076 psi iglide® J bearings are not suitable for extreme loads.

Best Applications

- For high speeds
- For highest wear resistance at low to medium pressures
- When very low coefficients of friction are necessary
- When a cost effective bearing for low pressure loads is needed

Not For Use In Applications

When high pressure loads occur
➤ iglide® G300
When short-term temperatures occur that are greater than 248°F
➤ iglide® G300
When a low-cost bearing for occasional movements is necessary
➤ iglide® G300

Typical application areas

- Automation
- Printing industry
- Cleanroom
- Aerospace engineering
- Beverage technology
- Automation

max. +194°F
min. –58°F

Ø 1/4 to 1 inch
more sizes available from igus

Ø 1.5 to 110 mm
metric sizes available from igus

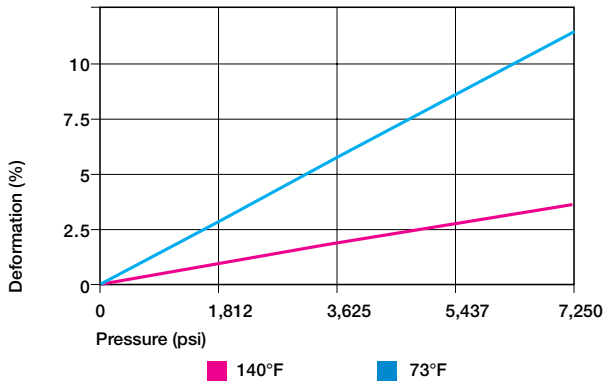
iglide® J - Technical data

Material Properties Table

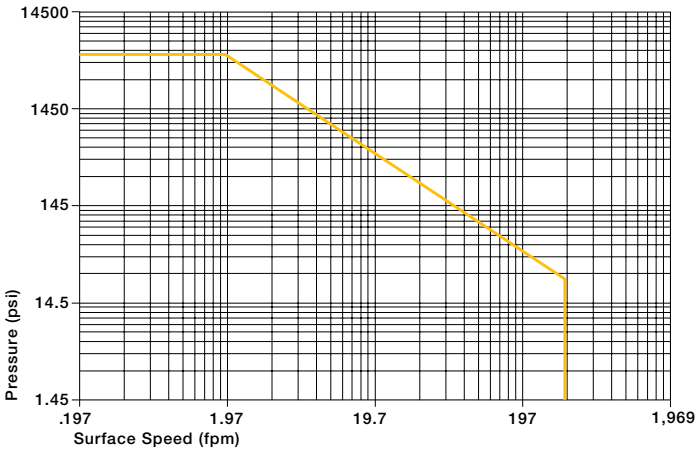
General Properties	Unit	iglide® J	Testing Method
Density	g/cm³	1.49	
Color		yellow	
Max. moisture absorption at 73°F / 50% r.h.	% weight	0.3	DIN 53495
Max. moisture absorption	% weight	1.3	
Coefficient of friction, dynamic against steel	µ	0.06 - 0.18	
pv value, max. (dry)	psi x fpm	9,700	
Mechanical Properties			
Modulus of elasticity	psi	348,100	DIN 53457
Tensile strength at 68°F	psi	10,590	DIN 53452
Compressive strength	psi	8,702	
Permissible static surface pressure (68°F)	psi	5,076	
Shore D-hardness		74	DIN 53505
Physical and Thermal Properties			
Max. long-term application temperature	°F	194	
Max. application temperature, short-term	°F	248	
Min. application temperature	°F	-58	
Thermal conductivity	W/m x K	0.25	ASTM C 177
Coefficient of thermal expansion	$K^{-1} \times 10^{-5}$	10	DIN 53752
Electrical Properties			
Specific volume resistance	Ωcm	$> 10^{13}$	DIN IEC 93
Surface resistance	Ω	$> 10^{12}$	DIN 53482

Compressive Strength

With a maximum permissible surface pressure of 5,075 psi, iglide® J plain bearings are not suited for extreme loads. The graph shows the elastic deformation of iglide® J for radial loads. At the maximum permissible load of 5,075 psi, the deformation is less than 2.5%.



Deformation under load and temperature



Permissible pv value for iglide® J running dry against steel shaft, at 68°F

Permissible Surface Speeds

The low coefficient of friction and the extremely low stick-slip tendency of iglide® J plain bearings are especially important at very low speeds. However, iglide® J material can also be used for high speeds of over 197 fpm. In both cases,the static friction is very low and stick-slip does not occur. The maximum values given in the table can only be achieved at the lowest pressure loads. At the given speeds, friction can cause a temperature increase to maximum permissible levels. In practice, though, this temperature level is rarely reached, due to varying application conditions.

	Continuous fpm	Short Term fpm
Rotating	295	590
Oscillating	216	413
Linear	1574	1968

Maximum surface speeds

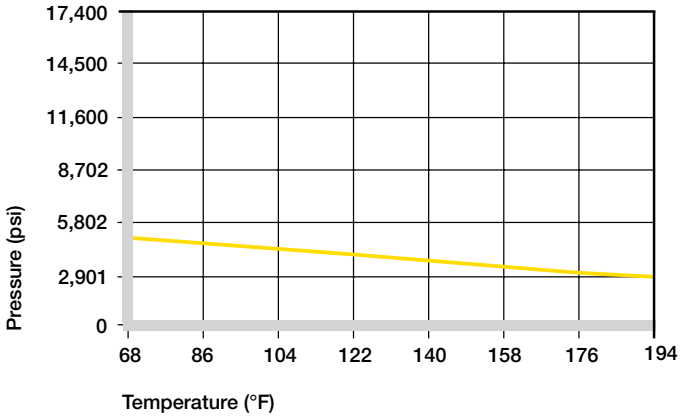
iglide® J - Technical data

Temperatures

iglide® J plain bearings can be used between -58°F and 194°F; the short-term maximum permissible temperature is 248°F. The graph shows that the compressive strength of iglide® J plain bearings decreases with increasing temperatures. Also, the wear increases significantly above 176°F

iglide® J	Application Temperature
Minimum	- 58°F
Max. long-term	+194°F
Max. short-term	+248°F
Additional axial securing	+140°F

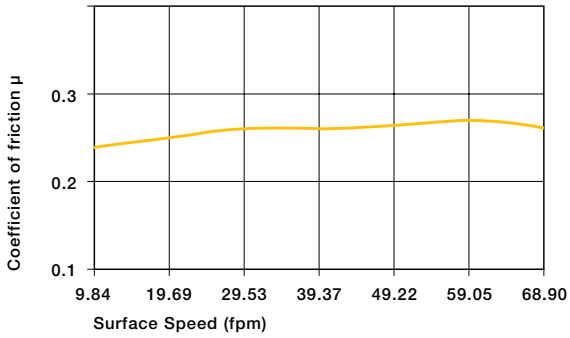
Temperature limits for iglide® J



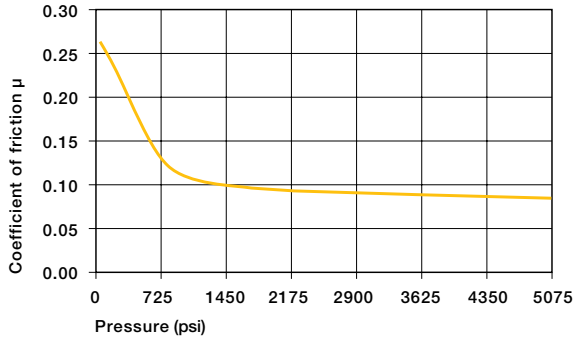
Recommended maximum permissible static surface pressure of iglide® J as a result of the temperature

Friction and Wear

The graph to the right shows the coefficients of friction for different loads. The coefficient of friction level is very good for all loads with iglide® J. Friction and wear are also dependent, to a large extent, on the shafting partner. With increasing shaft roughness, the coefficient of friction also increases. For iglide® J a ground surface with an average roughness range of 4 - 12 rms is recommended for the shaft.



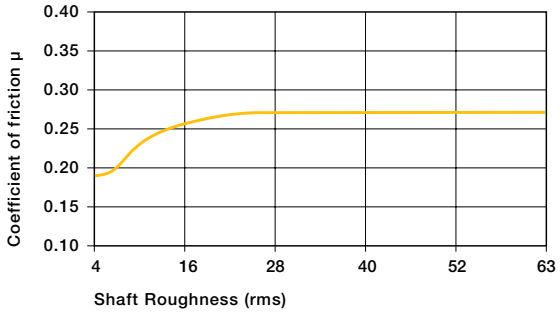
Coefficient of friction of iglide® J as a result of the surface speed; p = 108 psi



Coefficient of friction of iglide® J as a result of the load, v = 1.97 fpm

iglide® J	Coefficient of Friction
Dry	0.06 - 0.18
Grease	0.09
Oil	0.04
Water	0.04

Coefficients of friction for iglide® J against steel (Shaft finish = 40 rms, 50 HRC)

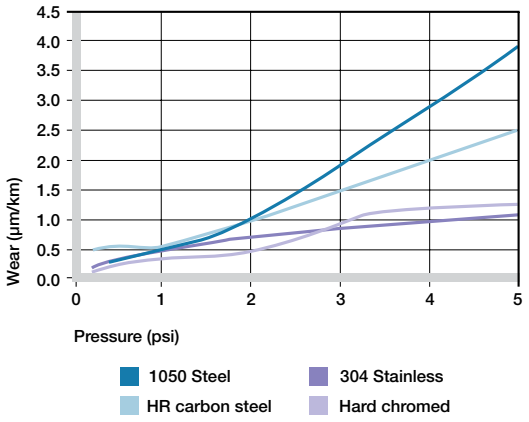


Coefficient of friction of iglide® J as a result of the shaft surface (1050 hard chromed)

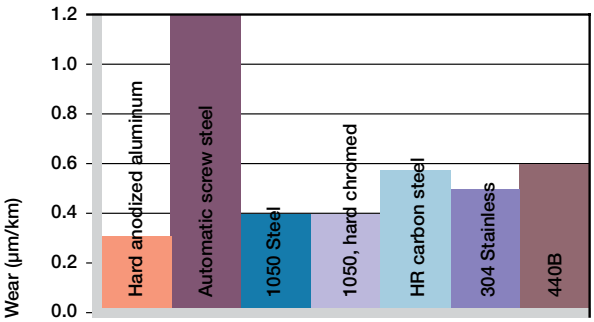
iglide® J - Technical data

Shaft Materials

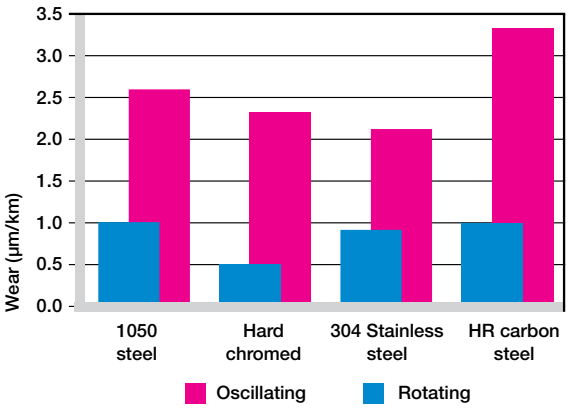
The graphs show results of testing different shaft materials with plain bearings made of iglide® J.
If iglide® J plain bearings are used in rotational applications with loads under 290 psi, several shaft materials are suitable. A Hard Chromed shaft provides the lowest wear in this range. When compared to most iglide® materials, iglide® J has very low wear results at low loads with all shaft materials tested.
Also, for increasing loads up to 725 psi, the wear resistance of iglide® J is excellent. Especially suitable is the combination of 303 stainless steel.
In oscillating operation with Cold Rolled Steel and HR Carbon Steel, the wear of iglide® J is slightly higher than for rotation. For oscillating movements with loads of 290 psi, iglide® J performs best with Cold Rolled Steel shaft.
As shown in the graph, the difference in wear between rotation and oscillating movements is most significant for 303 stainless steel shafts.
If the shaft material you plan to use is not contained in this list, please contact us.



Wear of iglide® J, rotating application with different shaft materials, depending on load



Wear of iglide® J, rotating application with different shaft materials, p = 108 psi, v = 98 fpm



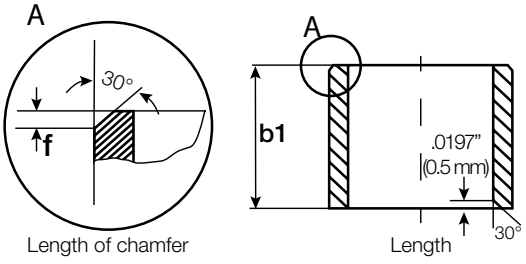
Wear for oscillating and rotating applications with different shaft materials under constant load p = 290 psi

Installation Tolerances

iglide® J plain bearings are oversized before being pressfit. After proper installation into a recommended housing bore, the inner diameter adjusts to meet our specified tolerances. Please adhere to the catalog specifications for housing bore and recommended shaft sizes. This will help to ensure optimal performance of iglide® plain bearings.

For Inch Size Bearings		
Length Tolerance (b1)		
Length (inches)	Tolerance (h13) (inches)	Length of Chamfer (f) Based on d1
0.1181 to 0.2362	-0.0000 /-0.0071	f = .012 → d_1 .040" - .236"
0.2362 to 0.3937	-0.0000 /-0.0087	f = .019 → d_1 > .236" - .472"
0.3937 to 0.7086	-0.0000 /-0.0106	f = .031 → d_1 > .472" - 1.18"
0.7086 to 1.1811	-0.0000 /-0.0130	f = .047 → d_1 > 1.18"
1.1811 to 1.9685	-0.0000 /-0.0154	
1.9685 to 3.1496	-0.0000 /-0.0181	

For Metric Size Bearings		
Length Tolerance (b1)		
Length (mm)	Tolerance (h13) (mm)	Length of Chamfer (f) Based on d1
1 to 3	-0 /-140	f = 0.3 → d_1 1 - 6 mm
> 3 to 6	-0 /-180	f = 0.5 → d_1 > 6 - 12 mm
> 6 to 10	-0 /-220	f = 0.8 → d_1 > 12 - 30 mm
>10 to 18	-0 /-270	f = 1.2 → d_1 > 30 mm
>18 to 30	-0 /-330	
>30 to 50	-0 /-390	
>50 to 80	-0 /-460	



iglide® J - Technical data

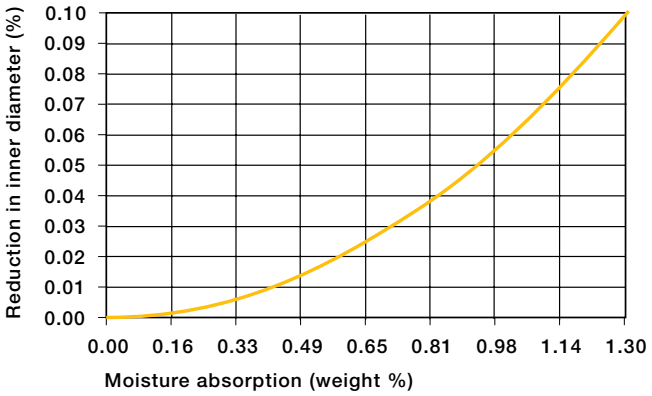
Chemical Resistance

iglide® J plain bearings are resistant to diluted lyes and very weak acids, as well as fuels and all types of lubricants. The low moisture absorption also permits use in wet or damp environments. Plain bearings made of iglide® J are resistant to common cleaning agents used in the food industry. The moisture absorption of iglide® J plain bearings is 0.3% in standard atmosphere. The saturation limit in water is 1.3%. These values are so low that possible design changes due to absorption are only necessary in extreme cases.

Medium	Resistance
Alcohol	+
Hydrocarbon	+
Greases, oils without additives	+
Fuels	+
Weak acids	0 to –
Strong acids	–
Weak alkaline	+
Strong alkaline	+ to 0

+ resistant, 0 conditionally resistant, – not resistant

Chemical resistance of iglide® J
All data given concerns the chemical resistance at room temperature (68°F).



Effect of moisture absorption on iglide® J plain bearings

Radiation Resistance

Plain bearings made from iglide® J are resistant to radiation up to an intensity of 3 x 10^2 Gy.

UV-Resistance

iglide® J plain bearings become discolored under UV radiation. However, hardness, compressive strength and the wear resistance of the material do not change.

Vacuum

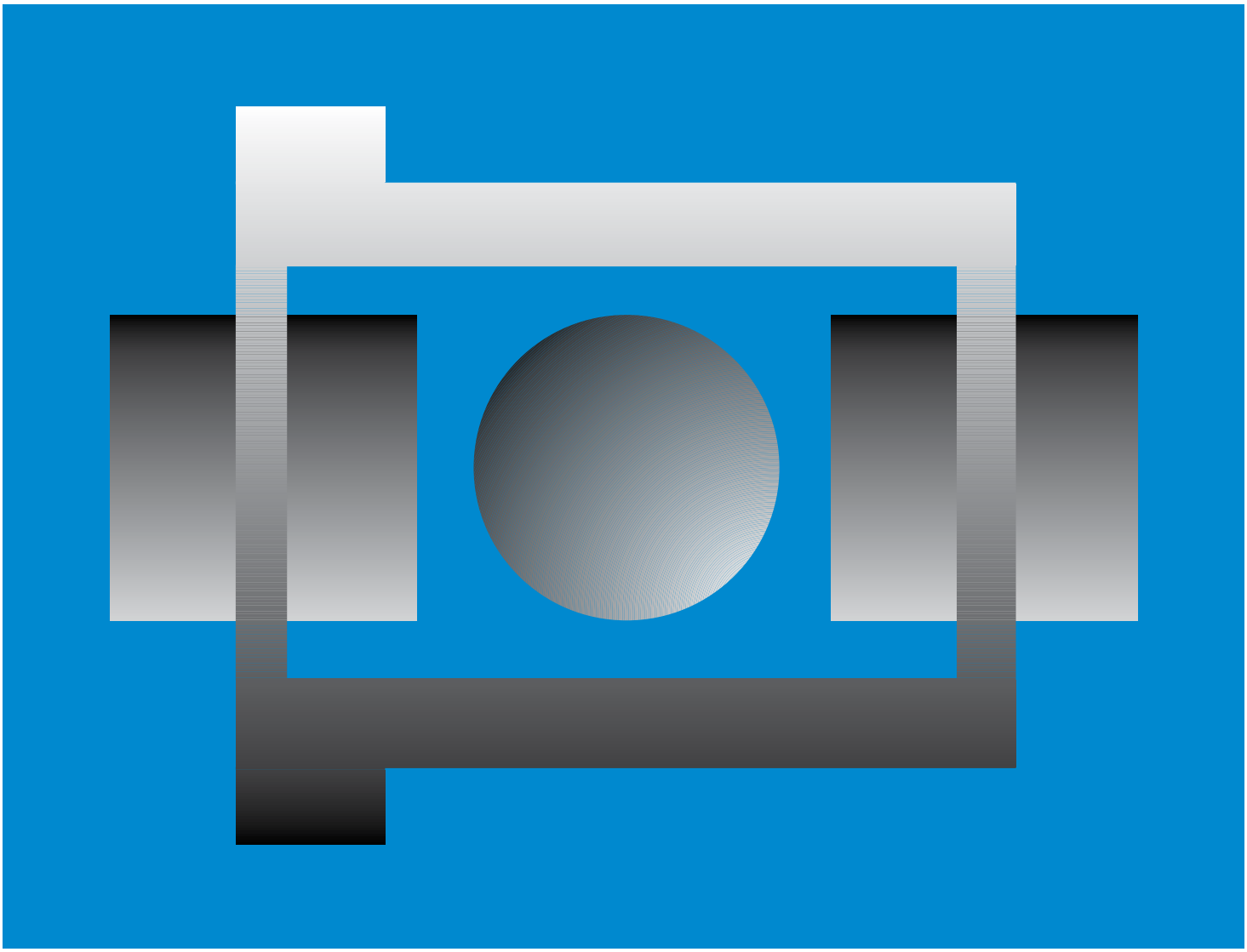
When used in a vacuum environment, the iglide® J plain bearings release moisture as a vapor. Therefore, only dehumidified bearings made of iglide® J are suitable for the vacuum environment.

Electrical Properties

iglide® J plain bearings are electrically insulating.

iglide® J	
Specific volume resistance	> 10^{13} Ωcm
Surface resistance	> 10^{12} Ω

Electrical properties of iglide® G300

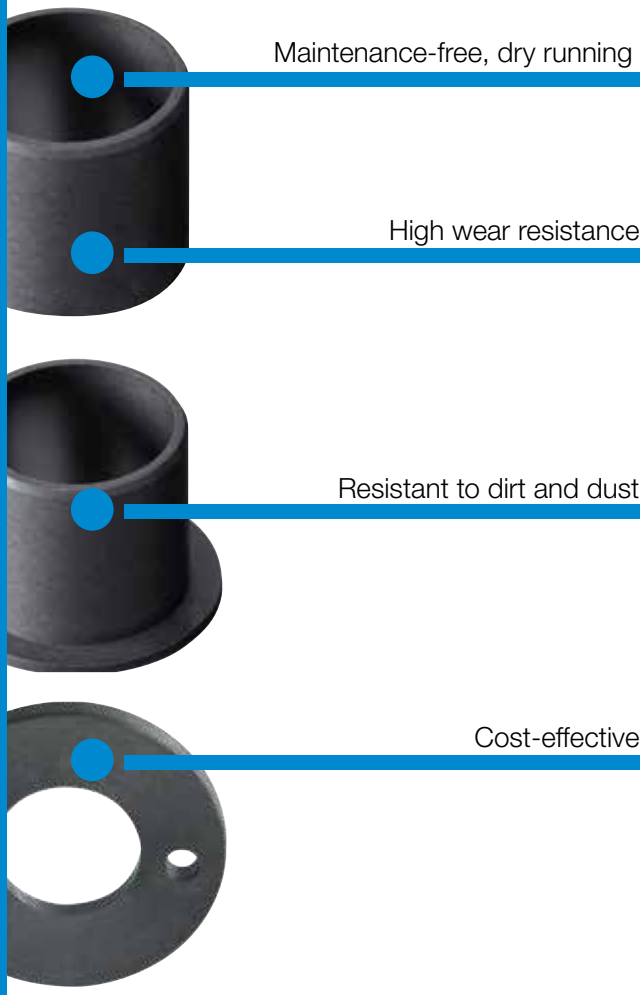


iglide® G300

- High wear resistance
- Resistance to dust and dirt
- Economic
- Self-lubricating and maintenance free

iglide® G300 - General Purpose

Most popular iglide® material worldwide



iglide® G300 bearings cover an extremely wide range of different requirements. Typical applications include medium to high loads, medium sliding speeds and medium temperatures. Typical applications include medium to high loads, medium sliding speeds and medium temperatures.

Best Applications

- When you need an economical all-around performance bearing
- For low to average surface speeds
- When the bearing needs to run on different shaft materials
- For oscillating and rotating movements

Not For Use In Applications

- When mechanical reaming of the wall surface is necessary
- When the highest wear resistance is necessary
- When universal chemical resistance is required
  ➤ iglide® T500
- If temperatures are constantly greater than +266°F
  ➤ iglide® T500
- For underwater use

Typical application areas

- Agricultural machines
- Machine building
- Sports and leisure
- Automotive
- Mechatronics
- Construction machinery

max. +266°F
min. –40°F

Ø 1/4 to 1 inch
more **sizes available from igus**

Ø 1.5 to 150 mm
metric sizes available from igus

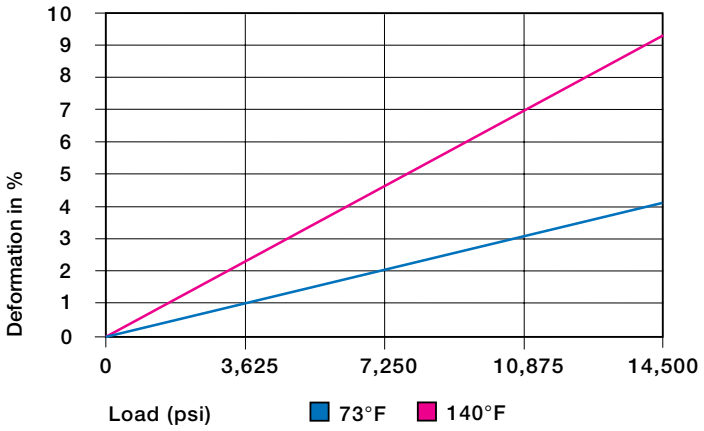
iglide® G300 - Technical Data

Material Properties Table

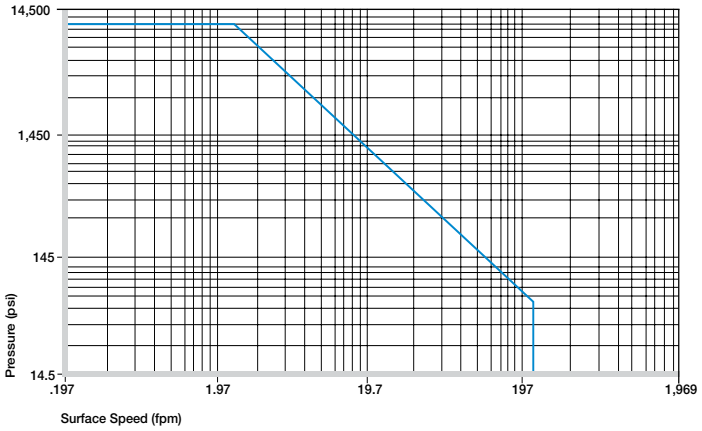
General Properties	Unit	iglide® G300	Testing Method
Density	g/cm³	1.46	
Color		dark gray	
Max. moisture absorption at 73°F / 50% r.h.	% weight	0.7	DIN 53495
Max. moisture absorption	% weight	4.0	
Coefficient of friction, dynamic against steel	µ	0.08 - 0.15	
pv value, max. (dry)	psi x fpm	12,000	
Mechanical Properties			
Modulus of elasticity	psi	1,131,000	DIN 53457
Tensile strength at 68°F	psi	30,460	DIN 53452
Compressive strength	psi	11,310	
Permissible static surface pressure (68°F)	psi	11,600	
Shore D-hardness		81	DIN 53505
Physical and Thermal Properties			
Max. long-term application temperature	°F	266	
Max. application temperature, short-term	°F	428	
Min. application temperature	°F	-40	
Thermal conductivity	W/m x K	0.24	ASTM C 177
Coefficient of thermal expansion	$K^{-1} \times 10^{-5}$	9	DIN 53752
Electrical Properties			
Specific volume resistance	Ωcm	$> 10^{13}$	DIN IEC 93
Surface resistance	Ω	$> 10^{11}$	DIN 53482

Compressive Strength

The graph shows the elastic deformation of iglide® G300 during radial loading. At the maximum permissible load of 11,600 psi, the deformation is less than 5%. The plastic deformation is minimal up to a pressure of approximately 14,500 psi. However, it is also a result of the cycle time.



Deformation under load and temperature



Permissible pv value for iglide® G300 running dry against a steel shaft, at 68°F

Permissible Surface Speeds

iglide® G300 has been developed for low to medium surface speeds. The maximum values shown in the table can only be achieved at low pressure loads. At the given speeds, friction can cause a temperature increase to maximum permissible levels. In practice, though, this temperature level is rarely reached, due to varying application conditions.

	Continuous fpm	Short Term fpm
Rotating	196	393
Oscillating	137	275
Linear	787	984

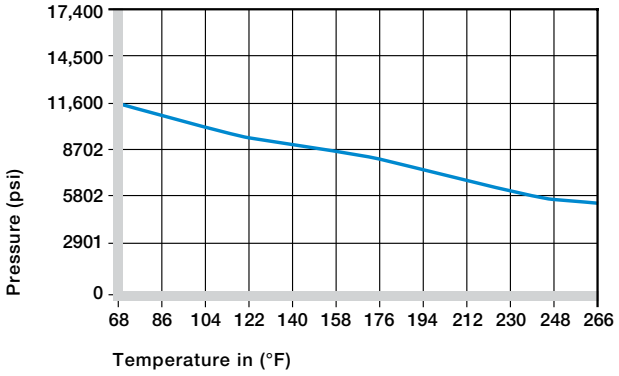
Maximum surface speeds

iglide® G300 - Technical Data

Temperatures

Application temperatures affect the properties of plain bearings greatly. The short-term maximum temperature is 428°F, this allows the use of iglide® G300 plain bearings in heat treating applications in which the bearings are not subjected to additional loading.

With increasing temperatures, the compressive strength of iglide® G300 plain bearings decreases. The graph shows this inverse relationship. However, at the long-term maximum temperature of 266°F, the permissible surface pressure is still above 5,800 psi.
The ambient temperatures that are prevalent in applications also has an effect on the bearing wear. With increasing temperatures, the wear increases and this effect is notable starting at the temperature of 248°F.



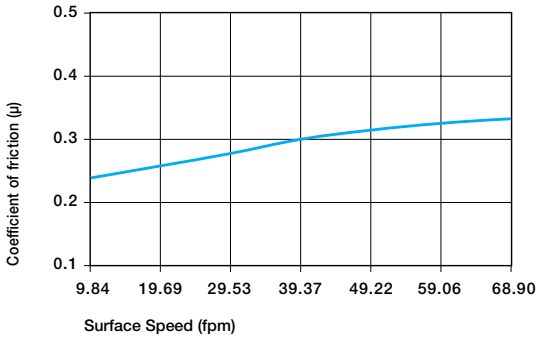
Recommended maximum permissible static surface pressure of iglide® G300 as a result of temperature

iglide® G300	Application Temperature
Minimum	- 40°F
Max. long-term	+266°F
Max. short-term	+428°F
Additional axial securing	+176°F

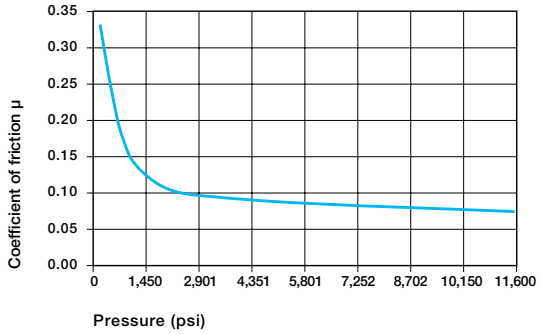
Temperature limits for iglide® G300

Friction and Wear

Similar to wear resistance, the coefficient of friction μ also changes with the load. The coefficient of friction decreases with increasing loads, whereas an increase in surface speed causes an increase of the coefficient of friction. This relationship explains the excellent results of iglide® G300 plain bearings for high loads and low speeds.
The friction and wear are also dependent, to a large degree, on the shaft partner. Shafts that are too smooth, increase both the coefficient of friction and the wear of the bearing. For iglide® G300, a ground surface with an average roughness Ra= 32 rms is recommended.



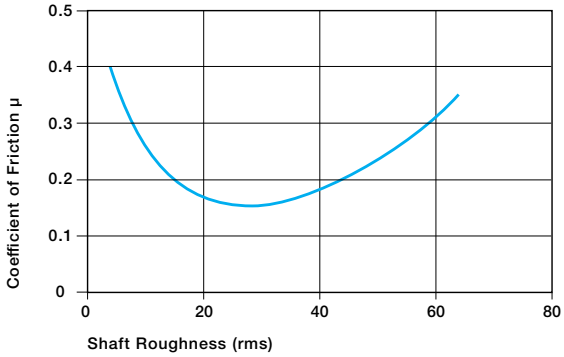
Coefficient of friction of iglide® G300 as a result of the running speed; p = 108 psi



Coefficient of friction of iglide® G300 as a result of the load, v = 1.96 fpm

iglide® G300	Coefficient of Friction
Dry	0.08 - 0.15
Grease	0.09
Oil	0.04
Water	0.04

Coefficient of friction for iglide® G300 against steel (Shaft finish = 40 rms, 50 HRC)



Coefficient of friction as result of the shaft surface (Shaft - 1050 hard chromed)

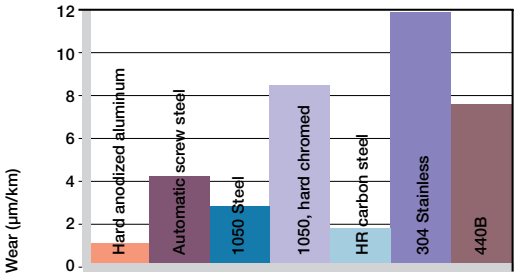
iglide® G300 - Technical Data

Shaft Materials

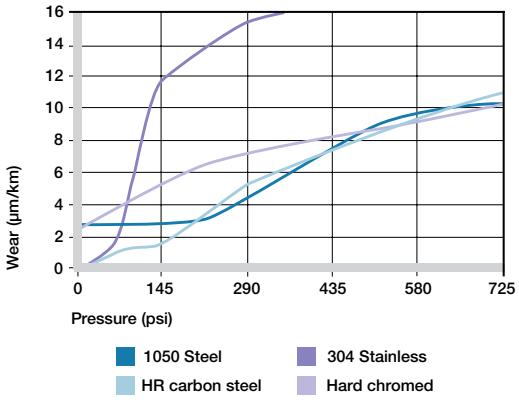
The graphs show results of testing different shaft materials with plain bearings made of iglide® G300. In the graph below it is observed that iglide® G300 can be combined with various shaft materials. The simple shaft materials of free-cutting steel and HR Carbon Steel have proven best at low loads. This helps to design cost-effective systems, since both iglide® G300 and the sliding partner are economically priced.

It is important to note that with increasing loads, the recommended hardness of the shaft increases. The “soft” shafts tend to wear more easily and thus increase the wear of the overall system. If the loads exceed 290 psi, it is important to recognize that the wear rate (the slope of the curves) clearly decreases with the hard shaft materials.

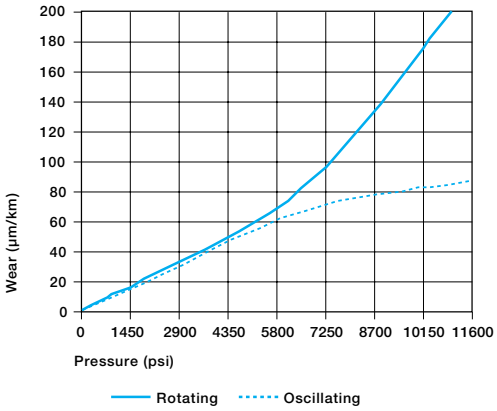
The comparison of rotational movements to oscillating movements shows that iglide® G300 can provide advantages in oscillating movements. The wear of the bearing is smaller for equivalent conditions. The higher the load, the larger the difference. This means that iglide® G300 can be used for oscillating movements that are well above the given maximum load of 11,600 psi. For these loads, the use of hardened shafts is recommended. In addition to the shaft materials presented here, many others have been tested. If the shaft material you plan on using is not contained in the test results presented here, please contact us.



Wear of iglide® G300, rotating with different shaft materials, load p = 145 psi, v = 59 fpm



Wear with different shaft materials in rotational operation, as a result of the load



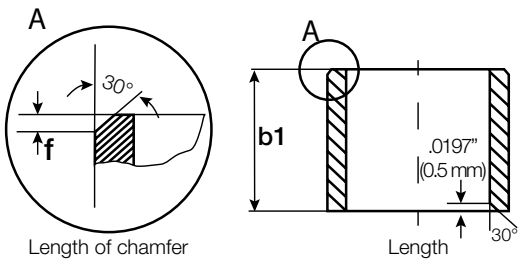
Wear for pivoting and rotating applications with shaft material 1050 hard chromed, as a result of the load

Installation Tolerances

iglide® G300 plain bearings are oversized before being pressfit. After proper installation into a recommended housing bore, the inner diameter adjusts to meet our specified tolerances. Please adhere to the catalog specifications for housing bore and recommended shaft sizes. This will help to ensure optimal performance of iglide® plain bearings.

For Inch Size Bearings		
Length Tolerance (b1)		
Length (inches)	Tolerance (h13) (inches)	Length of Chamfer (f) Based on d1
0.1181 to 0.2362	-0.0000 /-0.0071	f = .012 → d_1 .040” - .236”
0.2362 to 0.3937	-0.0000 /-0.0087	f = .019 → d_1 > .236” - .472”
0.3937 to 0.7086	-0.0000 /-0.0106	f = .031 → d_1 > .472” - 1.18”
0.7086 to 1.1811	-0.0000 /-0.0130	f = .047 → d_1 > 1.18”
1.1811 to 1.9685	-0.0000 /-0.0154	
1.9685 to 3.1496	-0.0000 /-0.0181	

For Metric Size Bearings		
Length Tolerance (b1)		
Length (mm)	Tolerance (h13) (mm)	Length of Chamfer (f) Based on d1
1 to 3	-0 /-140	f = 0.3 → d_1 1 - 6 mm
> 3 to 6	-0 /-180	f = 0.5 → d_1 > 6 - 12 mm
> 6 to 10	-0 /-220	f = 0.8 → d_1 > 12 - 30 mm
>10 to 18	-0 /-270	f = 1.2 → d_1 > 30 mm
>18 to 30	-0 /-330	
>30 to 50	-0 /-390	
>50 to 80	-0 /-460	



iglide® G300 - Technical Data

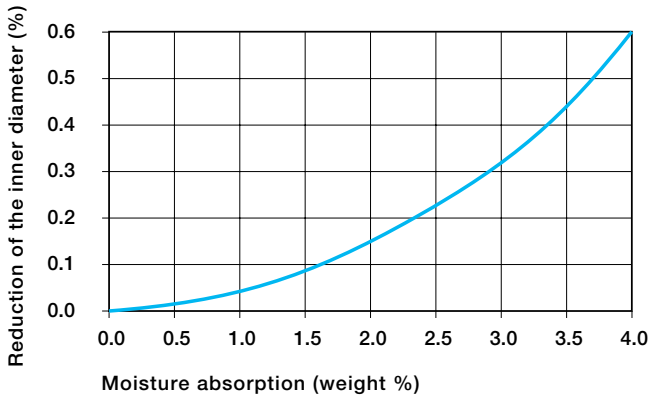
Chemical & Moisture Resistance

iglide® G300 plain bearings have strong resistance to chemicals. They are also resistant to most lubricants.
iglide® G300 plain bearings are not affected by most weak organic and inorganic acids.
The moisture absorption of iglide® G300 plain bearings is approximately 1% in the standard atmosphere. The saturation limit submerged in water is 4%. This must be taken into account for these types of applications.
➤ Chemical table, Page 1364

Medium	Resistance
Alcohol	+ to 0
Hydrocarbon	+
Greases, oils without additives	+
Fuels	+
Weak acids	0 to –
Strong acids	–
Weak alkaline	+
Strong alkaline	0

+ resistant, 0 conditionally resistant, – not resistant

Chemical resistance of iglide® G300
All data given concerns the chemical resistance at room temperature (68°F).



Effect of moisture absorption on iglide® G300 plain bearings

Radiation Resistance

Plain bearings made from iglide® G300 are resistant to radiation up to an intensity of 3 x 10^2 Gy.

UV-Resistance

iglide® G300 plain bearings are permanently resistant to UV-radiation.

Vacuum

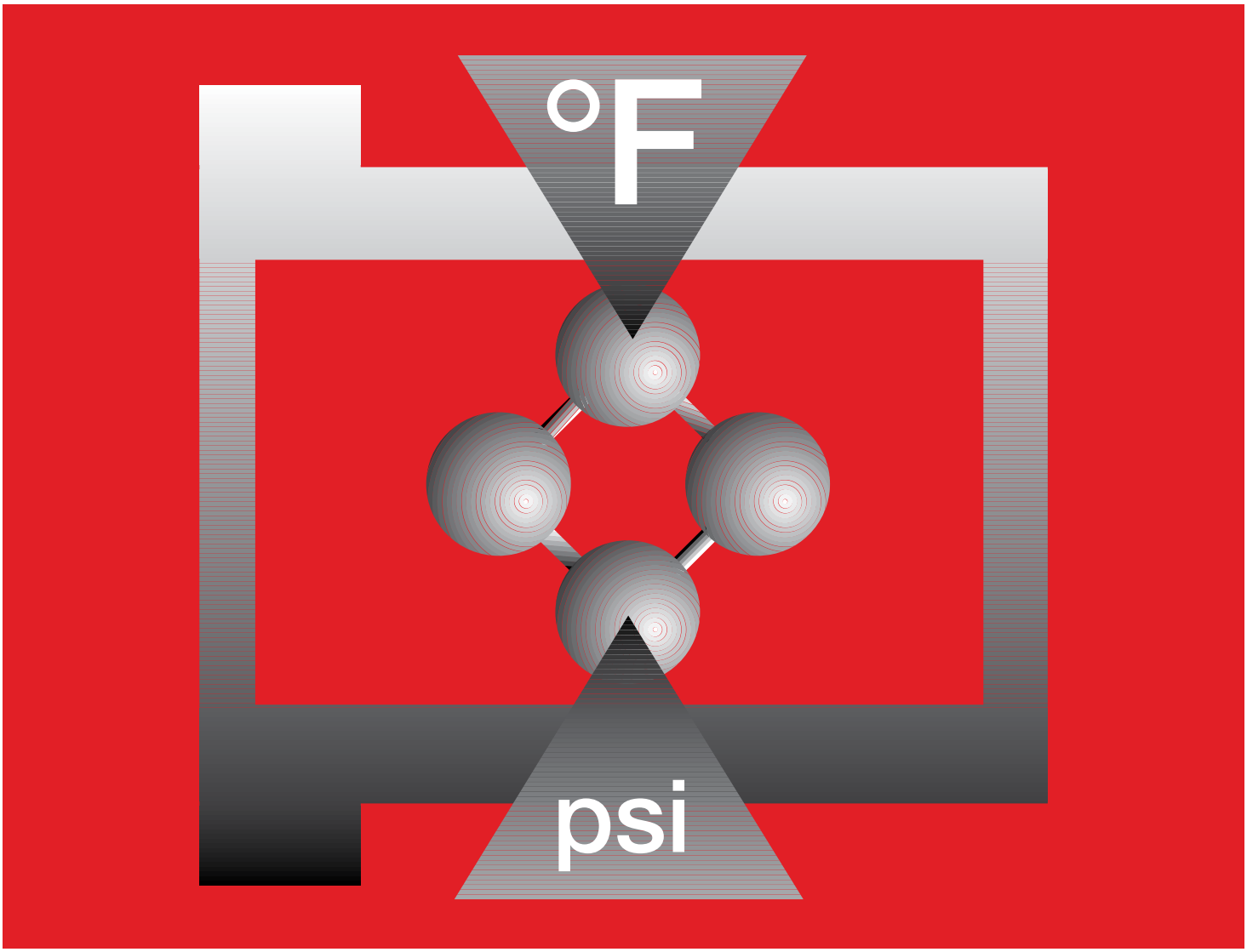
iglide® G300 plain bearings outgas in a vacuum. Use in a vacuum environment is only possible for dehumidified bearings.

Electrical Properties

iglide® G300 plain bearings are electrically insulating.

iglide® G300	
Specific volume resistance	> 10^{13} Ωcm
Surface resistance	> 10^{11} Ω

Electrical properties of iglide® G300



iglide® T500

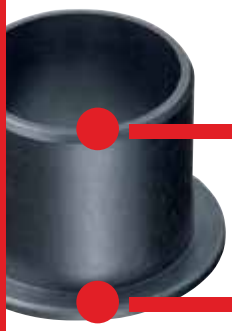
- Temperature resistant from -148°F to 482°F in continuous operation
- Universal resistance to chemicals
- High compressive strength
- Very low moisture absorption
- Excellent wear resistance through the entire temperature range

iglide® T500 - High-Tech Problem Solver

High temperature and chemical resistance

Temperature resistant from -148°F to 482°F in continuous operation

Universal resistance to chemicals



High compressive strength

Very low moisture absorption

Excellent wear resistance through the entire temperature range

iglide® T500 is defined by its combination of high temperature resistance with compressive strength, along with high resistance to chemicals. iglide® T500 is designed for higher speeds than other iglide® bearings.

Best Applications

- When especially high temperature resistance is necessary
- For pressure loads up to 21,760 psi
- For linear movements with a hard stainless steel
- For linear movements especially at high temperatures
- When universal resistance to chemicals is required
- Very low moisture absorption

Not For Use In Applications

- For very low wear at high loads
- For economical underwater applications
- For edge compression

Typical application areas

- Beverage technology
- Woodworking
- Aerospace engineering
- Cleanroom
- Plastic processing industry

max. +482°F
min. –148°F

Ø 1/4 to 1 inch
more **sizes available from igus**

Ø 2 to 75 mm
metric sizes available from igus

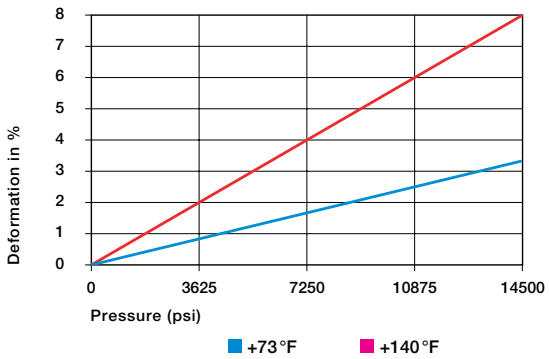
iglide® T500 - Technical Data

Material Properties Table

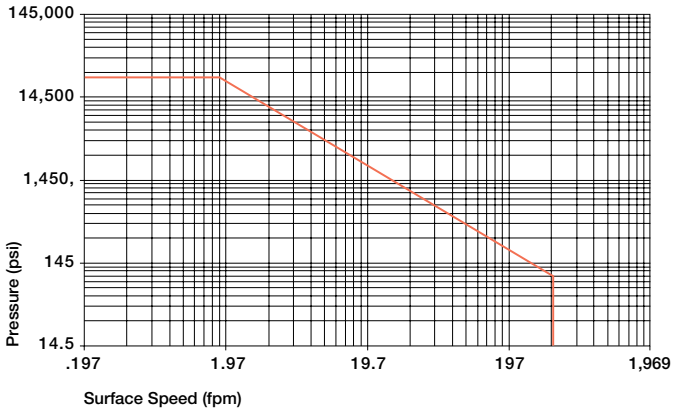
General Properties	Unit	iglide® T500	Testing Method
Density	g/cm³	1.44	
Color		black	
Max. moisture absorption at 73°F / 50% r.h.	% weight	0.1	DIN 53495
Max. moisture absorption	% weight	0.5	
Coefficient of friction, dynamic against steel	µ	0.09 - 0.27	
pv value, max. (dry)	psi x fpm	37,700	
Mechanical Properties			
Modulus of elasticity	psi	1,174,800	DIN 53457
Tensile strength at 68°F	psi	24,660	DIN 53452
Compressive strength	psi	14,500	
Permissible static surface pressure (68°F)	psi	21,760	
Shore D-hardness		85	DIN 53505
Physical and Thermal Properties			
Max. long-term application temperature	°F	482	
Max. application temperature, short-term	°F	599	
Min. application temperature	°F	-148	
Thermal conductivity	W/m x K	0.6	ASTM C 177
Coefficient of thermal expansion	$K^{-1} \times 10^{-5}$	5	DIN 53752
Electrical Properties			
Specific volume resistance	Ωcm	$< 10^5$	DIN IEC 93
Surface resistance	Ω	$< 10^3$	DIN 53482

Compressive Strength

The graph shows the special compression resistance of iglide® T500 also at very high temperatures. Even at the highest long-term application temperature of 482°F, iglide® T500 plain bearings still withstand a static surface pressure of approximately 4350 psi.



Deformation under load and temperature



Permissible pv values for iglide® T500 running dry against a steel shaft, at 68°F

Permissible Surface Speeds

iglide® T500 is designed for higher speeds than other iglide® bearings. This is due to its high temperature resistance and excellent heat conductivity. These benefits are readily apparent in the pv values of max. 37,700 psi x fpm. However, only the smallest radial loads may act on the bearings. At the given speeds, friction can cause a temperature increase to maximum permissible levels.

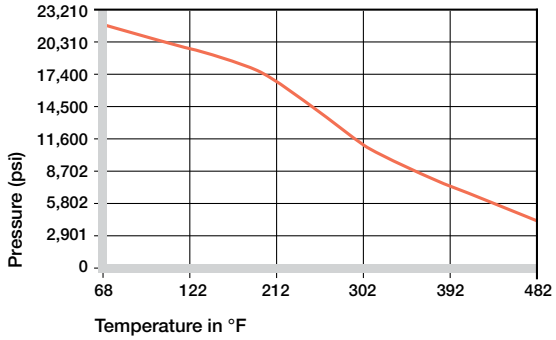
	Continuous fpm	Short Term fpm
Rotating	295	689
Oscillating	216	492
Linear	984	1968

Maximum surface speeds

iglide® T500 - Technical Data

Temperatures

In terms of temperature resistance, iglide® T500 has taken on a leading position. Having a permissible long-term application temperature of 482°F, iglide® T500 will even withstand 599°F for the short-term.
As in all thermoplastics, the compression resistance of T500 decreases with increasED temperature. However, the wear drops considerably when used within the observed temperature range of 73°F to 302°F. In certain cases, relaxation of the bearing can occur at temperatures greater than 275°F. This could lead to the bearing moving out of the housing after re-cooling. At temperatures over 275°F, the axial securing of the bearing in the housing needs to be tested. If necessary, secondary measures must be taken to mechanically secure the bearing. Please contact us if you have questions on bearing use.



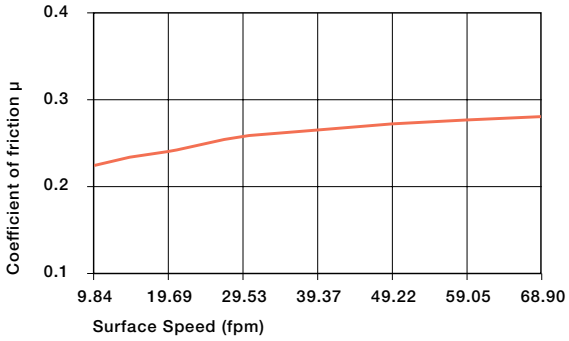
Recommended maximum permissible static surface pressure of iglide® T500 as a result of temperature

iglide® T500	Application Temperature
Minimum	- 148°F
Max. long-term	+482°F
Max. short-term	+599°F
Additional axial securing	+275°F

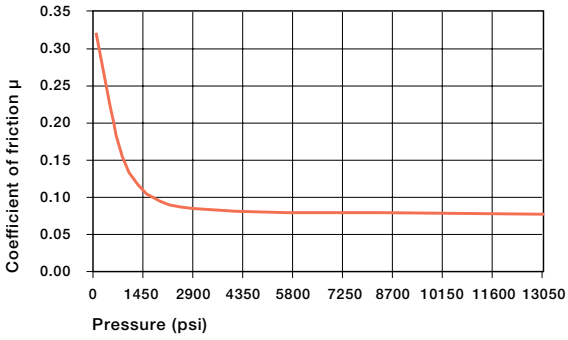
Temperature limits for iglide® T500

Friction and Wear

Similar to wear resistance, the coefficient of friction μ also changes with the load. The coefficient of friction increases with an increase in surface speed. On the other hand, an increased load has an inverse effect: the coefficient of friction decreases. This explains the excellent performance of iglide® T500 plain bearings for high loads.
Friction and wear are also dependent to a large degree on the shafting partner. Shafts that are too smooth increase the coefficient of friction of the bearing. For iglide® T500, a ground surface with an average roughness range of 24 - 32 rms is recommended for the shaft.



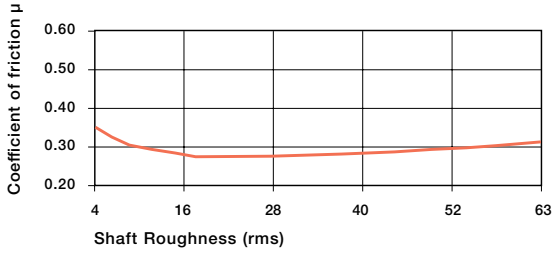
Coefficient of friction for iglide® T500 as a result of the surface speed; p = 108 psi, 1050 hard chromed



Coefficient of friction for iglide® T500 as a result of the load, v = 1.97 fpm

iglide® T500	Coefficient of Friction
Dry	0.09 - 0.27
Grease	0.09
Oil	0.04
Water	0.04

Coefficient of friction for iglide® T500 against steel (Shaft finish = 40 rms, 50 HRC)

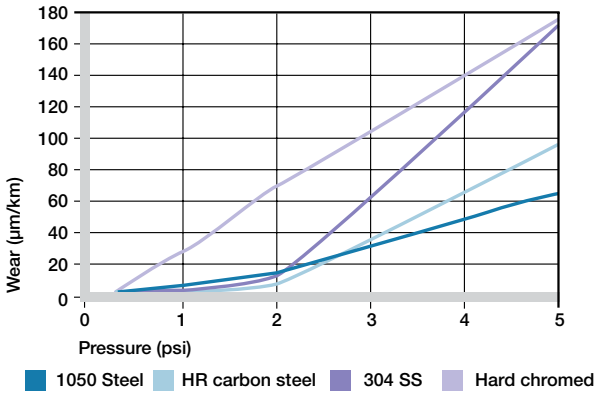


Coefficients of friction as a function of the shaft surface (1050 hard chromed)

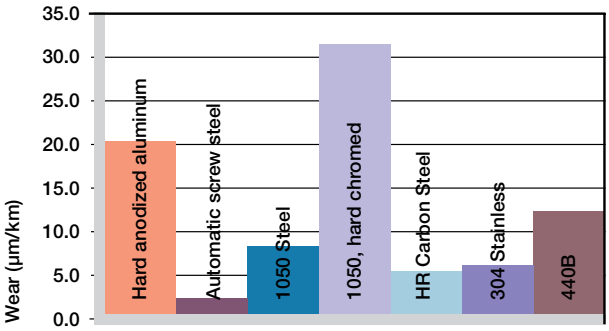
iglide® T500 - Technical Data

Shaft Materials

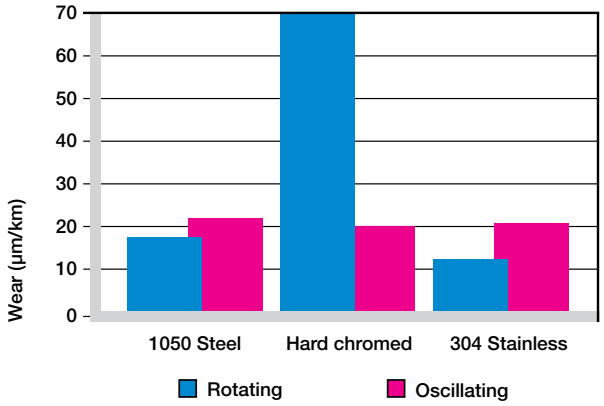
The graphs show results of testing different shaft materials with plain bearings made of iglide® T500. For low loads in rotating operation, the best wear values are found with 303 Stainless and HR Carbon Steel shafts. However, above a load of 290 psi, the bearing wear greatly increases with these two shaft materials. For the higher load range, hard-chromed shafts or Cold Rolled Steel shafts are advantageous. In oscillating operation at low loads, similar wear values for cold rolled steel and 303 stainless steel shafts occur. The wear is somewhat higher than during rotational movements.
If the shaft material you plan to use is not contained in this list, please contact us.



Wear of iglide® T500 with different shaft materials in rotational operation



Wear of iglide® T500 with different shaft materials, p = 108 psi, v = 98 fpm



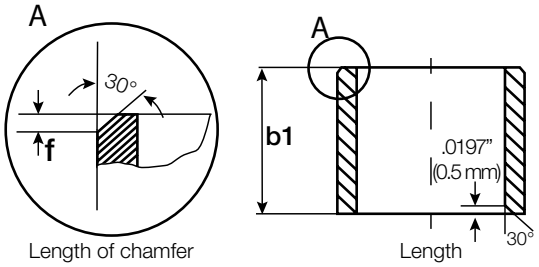
Wear for oscillating and rotating applications with different shaft materials p = 290 psi

Installation Tolerances

iglide® T500 plain bearings are oversized before being pressfit. After proper installation into a recommended housing bore, the inner diameter adjusts to meet our specified tolerances. Please adhere to the catalog specifications for housing bore and recommended shaft sizes. This will help to ensure optimal performance of iglide® plain bearings.

For Inch Size Bearings		
Length Tolerance (b1)		
Length (inches)	Tolerance (h13) (inches)	Length of Chamfer (f) Based on d1
0.1181 to 0.2362	-0.0000 /-0.0071	f = .012 → d_1 .040" - .236"
0.2362 to 0.3937	-0.0000 /-0.0087	f = .019 → d_1 > .236" - .472"
0.3937 to 0.7086	-0.0000 /-0.0106	f = .031 → d_1 > .472" - 1.18"
0.7086 to 1.1811	-0.0000 /-0.0130	f = .047 → d_1 > 1.18"
1.1811 to 1.9685	-0.0000 /-0.0154	
1.9685 to 3.1496	-0.0000 /-0.0181	

For Metric Size Bearings		
Length Tolerance (b1)		
Length (mm)	Tolerance (h13) (mm)	Length of Chamfer (f) Based on d1
1 to 3	-0 /-140	f = 0.3 → d_1 1 - 6 mm
> 3 to 6	-0 /-180	f = 0.5 → d_1 > 6 - 12 mm
> 6 to 10	-0 /-220	f = 0.8 → d_1 > 12 - 30 mm
>10 to 18	-0 /-270	f = 1.2 → d_1 > 30 mm
>18 to 30	-0 /-330	
>30 to 50	-0 /-390	
>50 to 80	-0 /-460	



iglide® T500 - Technical Data

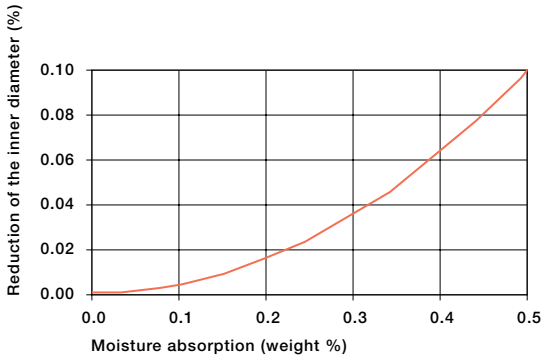
Chemical Resistance

iglide® T500 plain bearings are close to universally resistant to chemicals. They are only attacked by concentrated nitric acid and by sulfuric acid with acidity levels over 65%. The list at the end of this catalog provides more comprehensive detailed information.

Medium	Resistance
Alcohol	+
Hydrocarbon	+
Greases, oils without additives	+
Fuels	+
Weak acids	+
Strong acids	–
Weak alkaline	+
Strong alkaline	+

+ resistant, 0 conditionally resistant, – not resistant

Chemical resistance of iglide® T500
All data given concerns the chemical resistance at room temperature (68°F).



Effect of moisture absorption on iglide® T500 plain bearings

Radiation Resistance

Plain bearings made from iglide® T500 are resistant to radiation up to an intensity of $1x10^5$ Gy. iglide® T500 is the most radioactive-resistant material of the iglide® product line. iglide® T500 is extremely resistant to hard gamma radiation and withstands a radiation dose of 1000 Mrad without detectable change in its properties. The material also withstands an alpha or beta radiation of 10,000 Mrad with practically no damage.

UV Resistance

The excellent material properties of iglide® T500 do not change under UV radiation and other weathering effects.

Vacuum

In a vacuum environment, iglide® T500 plain bearings can be used virtually without restrictions. Outgassing takes place to a very limited extent.

Electrical Properties

iglide® T500 plain bearings are electrically conductive.

iglide® T500	
Specific volume resistance	< 10^5 Ωcm
Surface resistance	< 10^3 Ω

Electrical properties of iglide® T500

igubal® Mounted Spherical Bearings

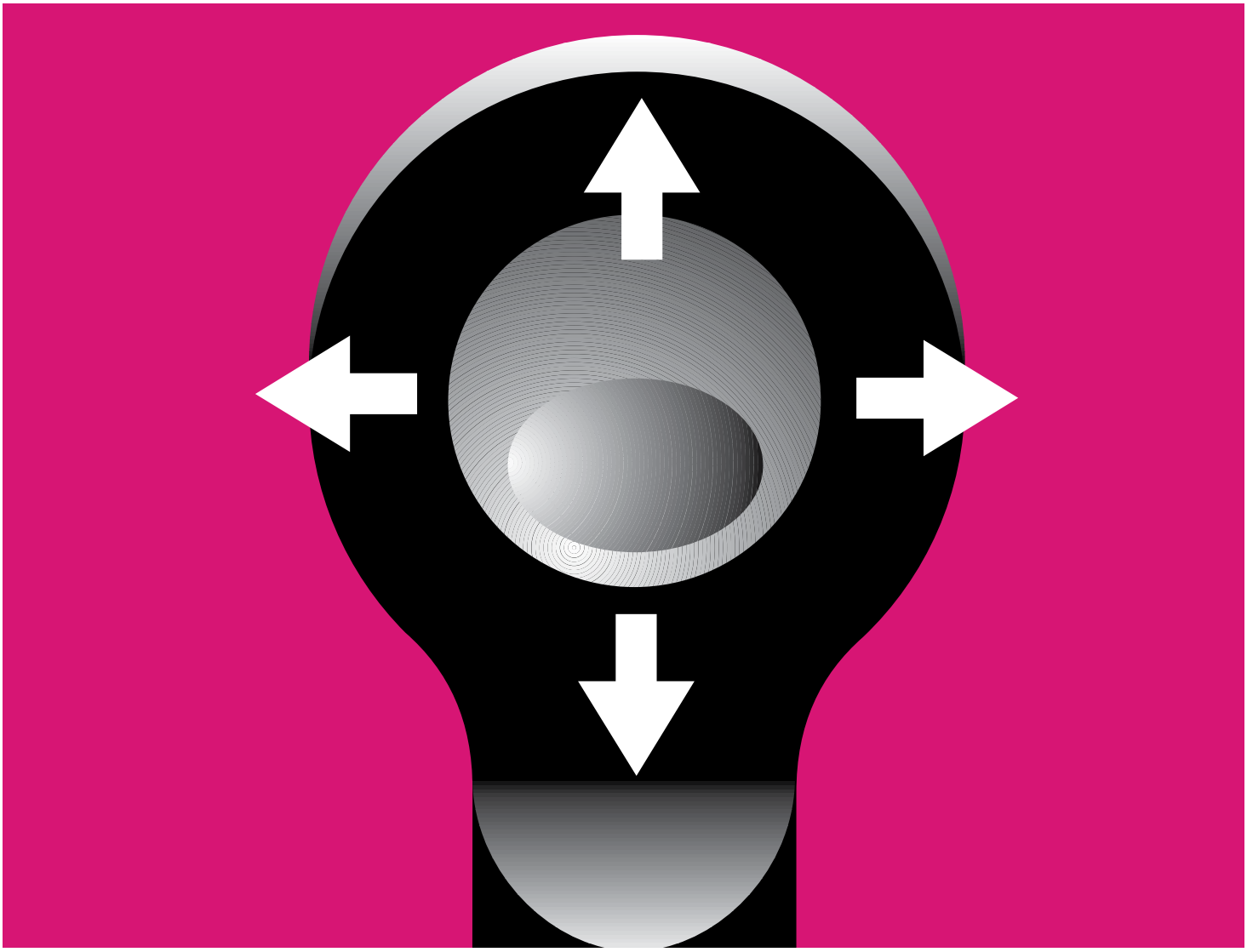
igus® igubal® mounted spherical bearings are made with high quality engineered polymers. They are lubrication-free and maintenance-free. These bearings are lighter and more economical than traditional mounted spherical bearings.

Features

- Five popular mounting configurations
- Four popular shaft sizes
- Maintenance-free
- Excellent wear resistance
- L280 polymer type bearing material

CE

igus® igubal® Mounted Spherical Bearings								
Item Photo	*Part Number*	*Style*	*Size I.D. (inch)*	*Thread/ Housing Type*	*Qty. per Package*	*Weight (lb)*	*Price*	*Drawing Link*
	A-KBRI-04	K Series, Female Thread, Rod End	1/4	1/4-28 UNF female	4	0.06	$2a6x:	PDF
	A-KBRI-08		1/2	1/2-20 UNF female	2	0.12	$2a6y:	PDF
	A-KBRI-12		3/4	3/4-16 UNF female	1	0.14	$2a6z:	PDF
	A-KBRI-16		1	1-12 UNF female	1	0.46	$;2a6]:	PDF
	A-KARI-04	K Series, Male Thread, Rod End	1/4	1/4-28 UNF male	4	0.04	$;2a6[:	PDF
	A-KARI-08		1/2	1/2-20 UNF male	2	0.10	$2a6_:	PDF
	A-KARI-12		3/4	3/4-16 UNF male	1	0.10	$2a6#:	PDF
	A-KARI-16		1	1-12 UNF male	1	0.34	$;2a6!:	PDF
	A-KSTI-04	K Series, Pillow Block	1/4	Pillow block	4	0.02	$2a72:	PDF
	A-KSTI-08		1/2		2	0.07	$2a73:	PDF
	A-KSTI-12		3/4		1	0.09	$2a74:	PDF
	A-KSTI-16		1		1	0.20	$2a75:	PDF
	A-EFOI-04	E Series, 2-Bolt Flange	1/4	2-bolt flange	4	0.03	$2a6?:	PDF
	A-EFOI-08		1/2		2	0.05	$;2a6,:	PDF
	A-EFOI-12		3/4		1	0.09	$2a70:	PDF
	A-EFOI-16		1		1	0.14	$2a71:	PDF
	A-EFSI-04	E Series, 4-Bolt Flange	1/4	4-bolt flange	4	0.04	$2a76:	PDF
	A-EFSI-08		1/2		2	0.04	$2a77:	PDF
	A-EFSI-12		3/4		1	0.12	$2a78:	PDF
	A-EFSI-16		1		1	0.17	$2a79:	PDF



igubal® Rod Ends

- Self-lubricating, maintenance-free
- High strength under impact loads
- High tensile strength
- Compensation of misalignment
- Compensation of edge loads
- Very low weight

igubal® Rod Ends

igubal® rod ends can also be used in rough environments. They are corrosion-resistant in humid environments and resistant to weak acids and bases. The operation temperature is from –40°F up to +176°C. Rod ends are also resistant to dirt and dust.

Maintenance free, dry-running

High strength under impact loads

High tensile strength

Best Applications

- If you want to save weight
- For rotating, oscillating and linear movements
- If high-frequency oscillations/vibrations occur
- If silent operation is required
- If you need an electrically insulating part
- If corrosion resistance is required
- In combination with pneumatic cylinders and gas struts
- If chemical resistance is required
- If high rigidity is required

Not For Use In Applications

- If temperatures are higher than +176 °F
- If rotation speeds higher than 98.4 fpm (0.5 m/s) are required
- If really high tensile and shear loads occur
- With a hydraulic cylinder
- If dimensions above 1 inch or 30 mm are required

Compensation of misalignment

Compensation of edge loads

Lightweight

max. +392°F
min. –40°F

Ø 1/4 to 1 inch
more sizes available from igus

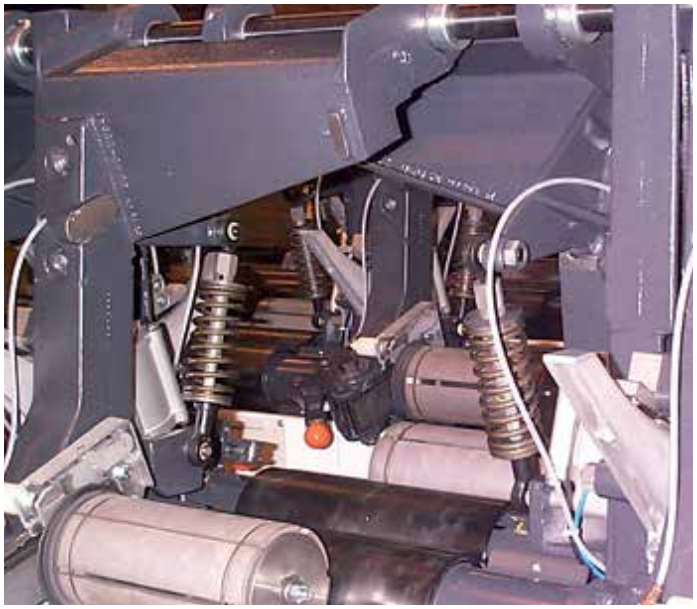
Ø 2 to 30 mm
metric sizes available from igus

igubal® Rod Ends - Application examples

Typical application areas

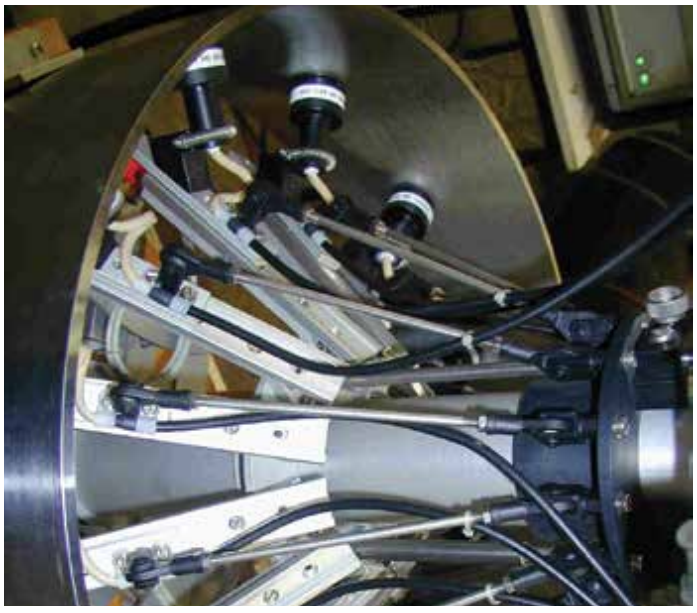
- Agricultural machines
- Machine building
- Sports and leisure
- Automotive
- Mechatronics
- Construction machinery

Specialty bikes



Textile industry

Packaging industry



Offshore industry

igubal® Rod Ends - Technical data

Advantages

- Maintenance-free
- High strength under impact loads
- Very high tensile strength for varying loads
- Compensation for misalignment
- Compensation for edge loads
- Resistant to dirt, dust and lint
- Resistant to corrosion and chemicals
- High vibration dampening capacity
- Suitable for rotating, oscillating and linear movements
- Lightweight
- Dimensional K series and E series, dimensions according to standard DIN ISO 12240

Product range

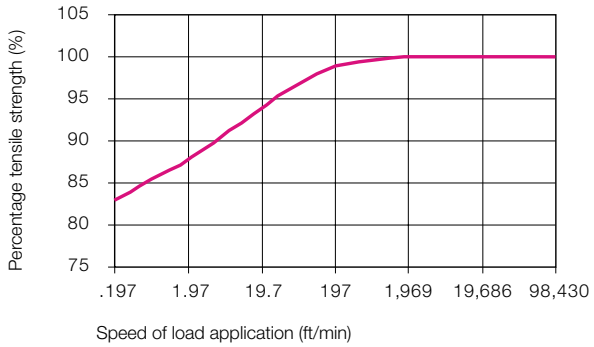
igubal® rod ends are available in the dimensional K series and E series for shaft diameters of 3/16 to 1 inch and 2 to 30 mm.

- Form A – with male thread and
- Form B – with female thread

The dimensional K series and, to a limited extent, E are available in inch dimensions, as well as a special version containing a stainless steel sleeve in the inner race. This allows a significantly higher torque than for the standard plastic race.

Loads

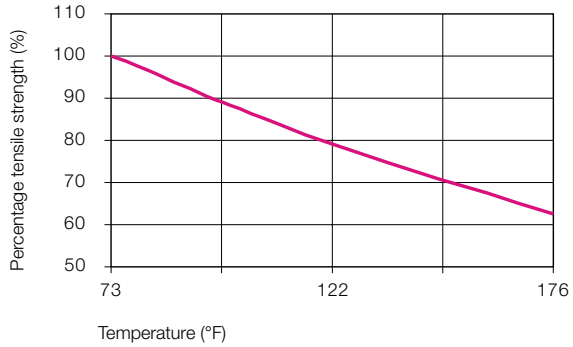
igubal® rod end bearings handle high loads at normal room temperatures, have excellent dampening properties and weigh only a fifth of traditional metallic rod end bearings. In applications with high continuous loads and high temperatures, the loading capacity of igubal® rod end bearings should be tested in an experiment that duplicates the application.



Effect of the speed of load application on the maximum tensile strength of igubal® rod end bearings

Coefficients of Friction and Speed

One important advantage of igubal® spherical bearings is that rapid, rotary movements of a mounted shaft take place directly in the spherical portion. In metallic rod ends, rotary motion takes place between the race and the spherical bearing. High speeds can be achieved with igubal® bearings.
igubal® bearings ares used in such a way that the angular movements of the spherical bearings take place at the spherical outer diameter. In contrast, rotations of the shaft are supported directly in the inner diameter of the spherical portion. The advantage, therefore, lies in the plastic vs. steel relationship. Plastic produces lower friction and permits high speeds, even when running dry.
The maintenance-free igubal® bearing system is also suited for linear and oscillating shaft movements.



Effect of the temperature on the maximum tensile strength of igubal® rod end bearings

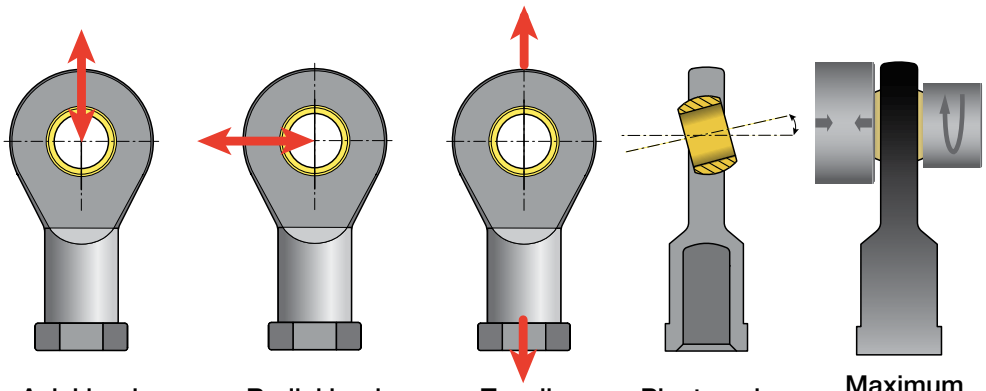
Temperatures

The igubal® rod ends can be used in temperatures from –22 °F up to +176 °F. igubal® rod ends made of HT-Material are suitable for temperatures from -40°F up to +392°F (E series, types A and B).

igubal® Rod Ends - Technical data

Tolerances

igubal® rod end bearings can be used at different tolerances depending on the individual application. As a standard program, they are designed with a large amount of bearing clearance, which permits secure operation even at high rotational speeds. The bore of the inner race is produced within a standard tolerance range. Shafts should also meet recommended tolerances.

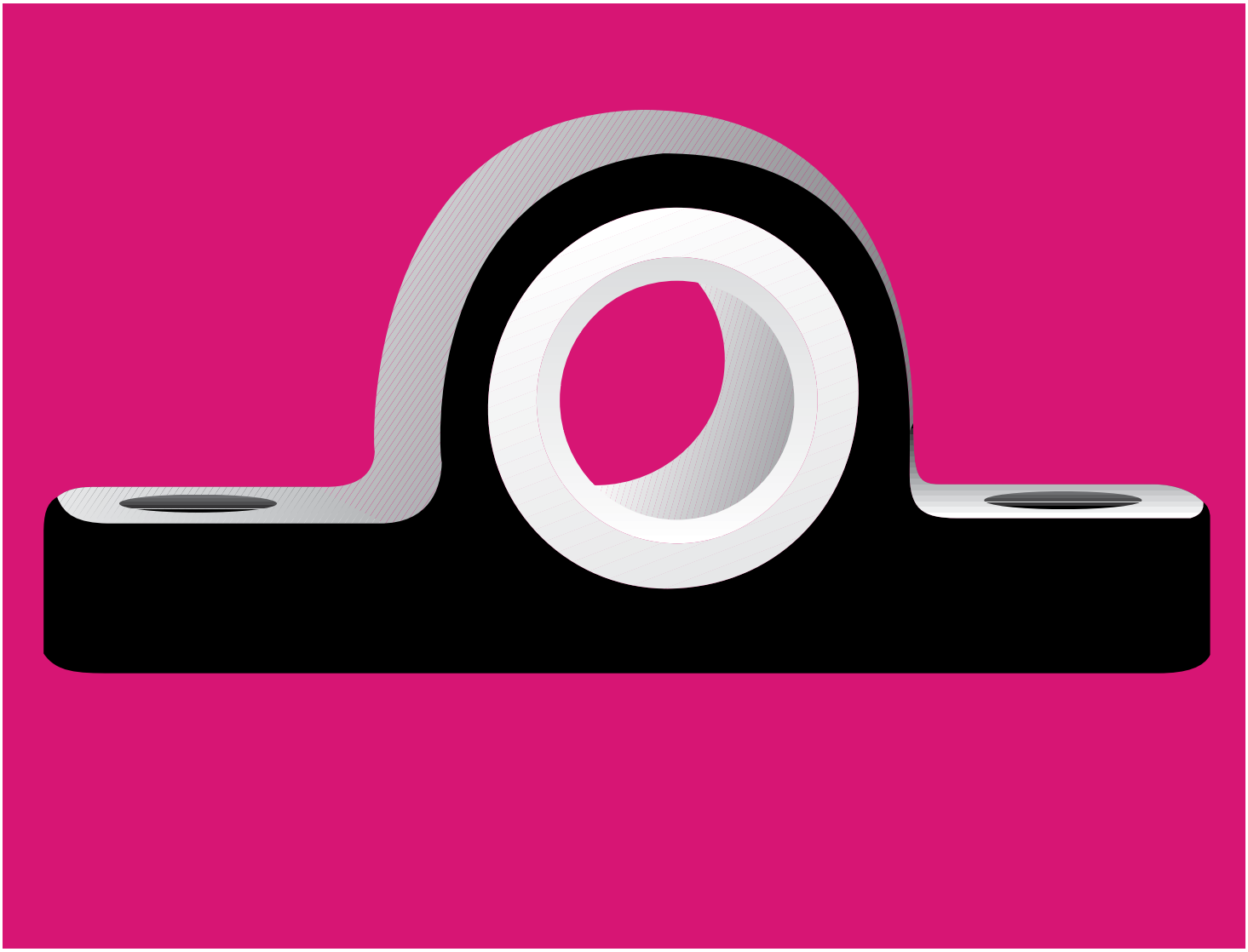


Recommended Shaft Tolerances

Inch	Shaft		Metric	Shaft	
	Min.	Max.		Min.	Max.
3/16	0.1888	0.1900	2mm	1.975	2.000
1/4	0.2485	0.2500	3mm	2.975	3.000
5/16	0.3110	0.3125	5mm	4.970	5.000
3/8	0.3735	0.3750	6mm	5.970	6.000
7/16	0.4358	0.4375	8mm	7.964	8.000
1/2	0.4983	0.5000	10mm	9.964	10.000
5/8	0.6235	0.6250	12mm	11.957	12.000
3/4	0.7479	0.7500	16mm	15.957	16.000
1	0.9980	1.0000	20mm	19.948	20.000

Thread pitches of the igubal® rod end bearings

Thread Name	Pitch (mm)
M 2	0.40
M 3	0.50
M 4	0.70
M 5	0.80
M 6	1.00
M 8	1.25
M 10	1.50
M 10 F	1.25
M 12	1.75
M 12 F	1.25
M 14	2.00
M 16	2.00
M 16 F	1.50
M 18	1.50
M 20	2.50
M 20 M 20	1.50
M 22	1.50
M 24	2.00
M 27	2.00
M 30	2.00

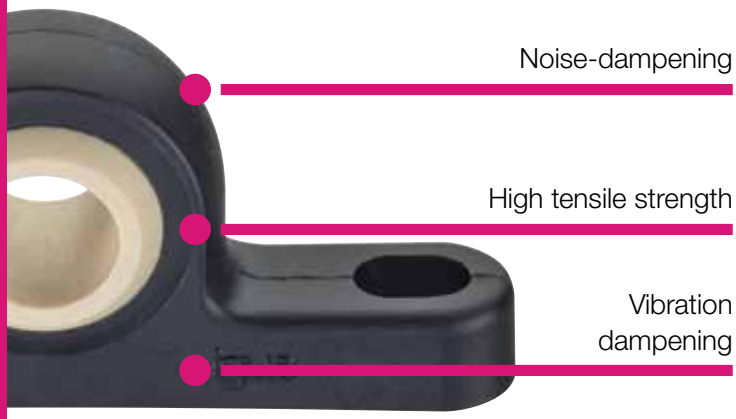


igubal® Pillow Block

- Maintenance-free, dry running
- High tensile strength
- High endurance strength
- Can be used in combination with E series rod ends
- Lightweight

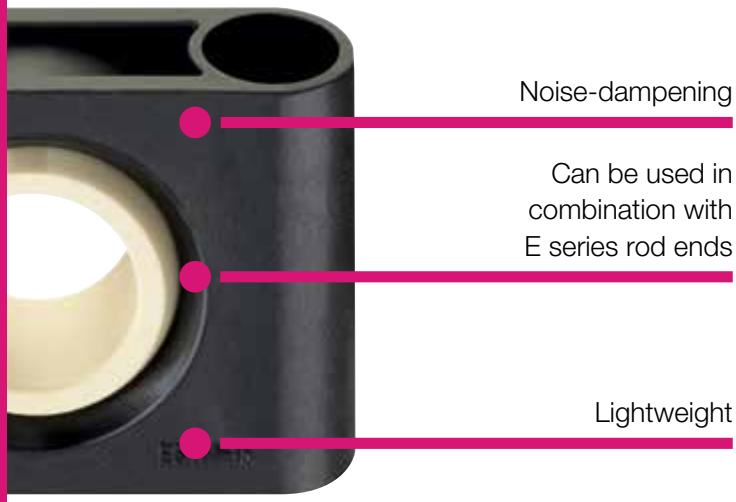
igubal® Pillow Block

The igubal® pillow block bearings consist of a housing with a bearing insert. igubal® pillow block bearings are especially easy to install, able to compensate for misalignment and prevent edge loads.



Best Applications

- If chemical resistance is required
- If a cost-effective option is requested
- If you need dirt-resistant bearings
- To account for misalignment
- If you need split components



Not For Use In Applications

- If temperatures are higher than +176 °F
- If an integrated fixing collar is required
- If diameters above 1 inch or 50 mm are required
- If rotation speeds higher than 98.4 fpm (0.5 m/s) are required

max. +176°F
min. –22°F

Ø 1/4 to 1 inch
more sizes available from igus

Ø 5 to 50 mm
metric sizes available from igus

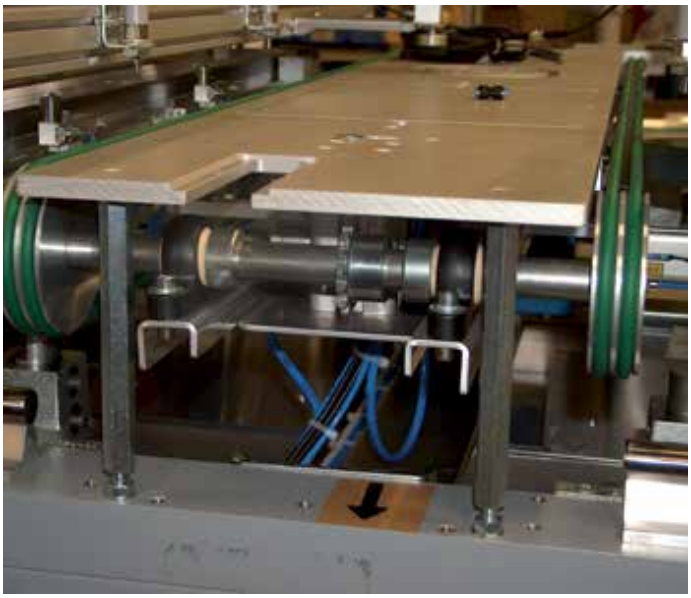
igubal® Pillow Block - Application examples

Typical application areas

- Plant design
- Machine building
- Packaging etc.

Stone processing

Solar technology



Paper industry

Packaging industry

igubal® Pillow Block - Technical data

General information

igubal® pillow blocks are made of igumid G according to DIN 71752. The pillow blocks are available in a variety of configurations. igubal® pillow blocks can be used in difficult circumstances without any problems. The pillow blocks are corrosion resistant in moist or wet environments and the sliding bearings are resistant to weak acids and alkalis. The operating temperatures range from -22°F to +176°F. igubal® pillow blocks are made out of a high-wear resistant material which requires no external lubrication.

Advantages

- Maintenance-free, self-lubricating
- High rigidity
- High strength under impact loads
- Compensation for misalignment
- Compensation for edge loads
- Corrosion-free
- Chemically resistant
- Vibration damping
- Suitable for rotating, oscillating and linear movements
- Lightweight
- High radial loads
- Can be used in liquid media
- Space-saving design
- Easy to install
- Predictable lifetime

Chemical resistance

The ability to pivot allows igubal® pillow block bearings to compensate for misalignment and possible shaft deflection. Applications where these effects cannot be prevented are suited for igubal pillow block bearings.

Tolerances

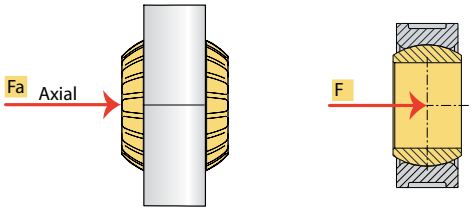
Maintenance-free igubal® pillow block bearings are designed with inside diameter tolerance of E10. The shaft should be made to tolerance class h6 to h9. These recommended tolerances allow for changes in the bearing due to temperature and moisture absorption.

Mounting

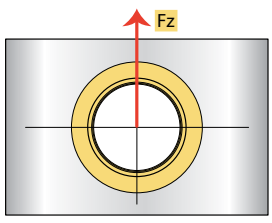
igubal® pillow block bearings are designed for mounting with 2 bolts. Precision mounting of the bearing is not necessary, since the spherical ball compensates for misalignment.

Loads

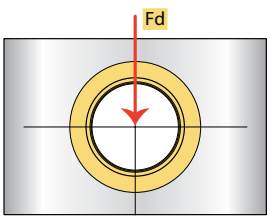
The load capacity of the maintenance-free igubal® bearing elements is very high at normal ambient temperatures. igubal® bearings absorb high forces and weigh only one fifth of traditional, metal bearing housings. The excellent dampening properties are based on the fact that the polymer material of the two part bearing can absorb vibrations differently than steel.
However, plastic specific properties, such as dependence on temperature and behavior under long-term stress, must be taken into consideration when using igubal® bearings. The load capacity of the pillow block should therefore be checked in a practical test, particularly if it will be used under continuous high loads and at elevated temperatures.



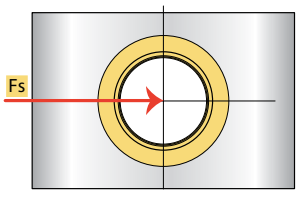
Axial Strength



Radial tensile strength (upward)

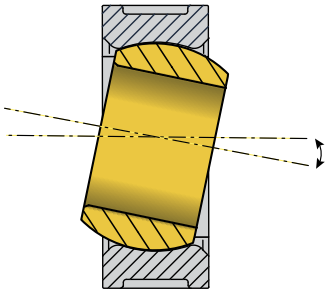


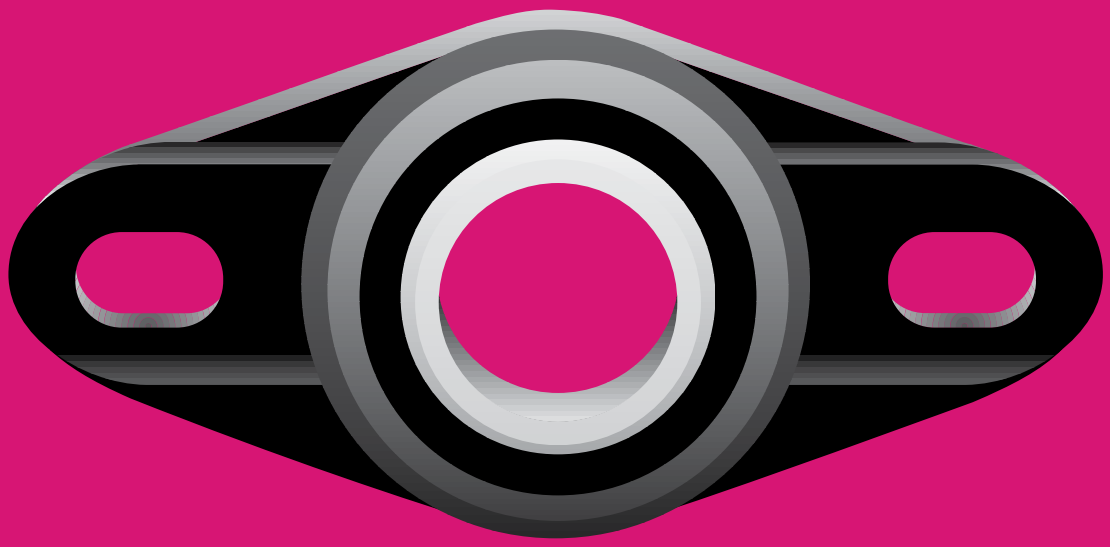
Radial compressive strength (downward)



Lateral strength (radial)

Pivot angle



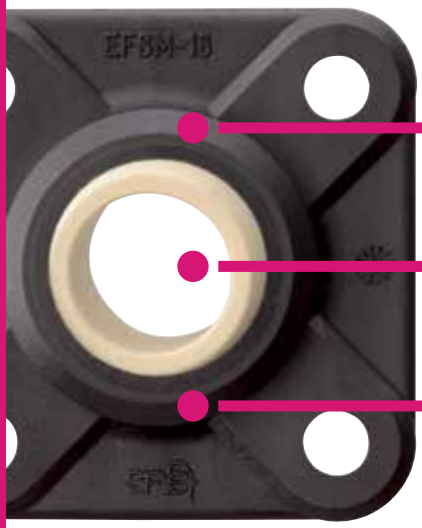


igubal® Flange Bearing

- Maintenance-free, dry running
- High tensile strength
- High endurance strength
- Compensation for alignment errors
- Compensation for edge loads
- Lightweight

igubal® Flange Bearing

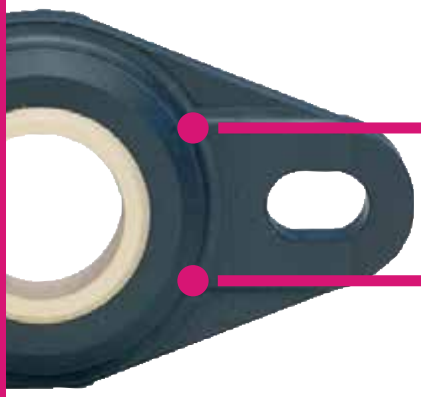
igubal® Flange bearings have been developed for the support of shaft ends or for shafts lead-through. Like all igubal® products, these bearings consist of an igumid G housing and an iglide® L280 spherical ball (with other options available). igubal® Flange bearings are made to the dimensional E series and are offered with two or four mounting holes.



Maintenance-free, dry running

High rigidity

High strength under impact loads



Lightweight

Low installation space

Best Applications

- If chemical resistance is required
- If a cost-effective option is requested
- If you need dirt-resistant bearings
- To adjust misalignment
- If you need split components

Not For Use In Applications

- If temperatures are higher than +176 °F
- If an integrated fixing collar is required
- If diameters above 1 inch or 50 mm are required
- If rotation speeds higher than 98.4 fpm (0.5 m/s) are required

max. +176°F
min. –40°F

inch **Ø 3/8 to 1 inch**
more sizes available from igus

mm **Ø 4 to 50 mm**
metric sizes available from igus

igubal® Flange Bearing - Application examples

Typical application areas

- Plant design
- Automation
- Agricultural machines
- Machine building
- Food industry etc.

Conveyor technique

Solar industry

Rotary sorter

Food industry

igubal® Flange Bearing - Technical data

General Properties

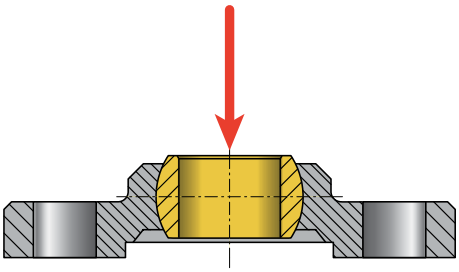
igubal® Flange bearings have been developed for the support of shaft ends or for shafts lead-through. Like all igubal® products, these bearings consist of an igumid G housing and an iglide® L280 spherical ball (with other options available). igubal® Flange bearings are made to the dimensional E series and are offered with two or four mounting holes.

Areas of Application

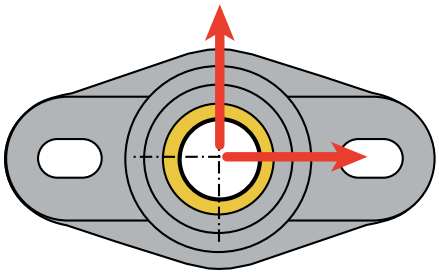
Since igubal® flange bearings are made for maintenance-free use, they are especially suited for applications in which access to the bearing is limited, in moist or wet environments or clean-room environments. Thus, igubal® flange bearings are also found in electric toothbrushes, awnings, conveyor technology, bakery machines and agriculture to name a few.

Installation

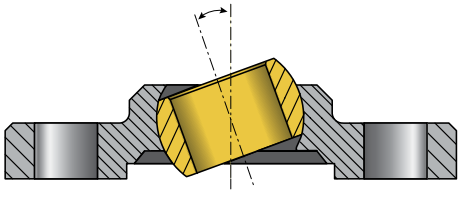
igubal® flange bearings are designed for mounting with 2 or 4 bolts, depending on the design. The 2-hole types are provided with elongated holes, which allow a problem-free adjustment. An exact positioning of the bearing housing is not necessary, since the spherical ball compensates for misalignment.



Static axial load



Static radial load



Pivot Angle

DryLin® R Linear Plain Bearings

igus® DryLin® R linear plain bearings are dimensionally interchangeable with other popular brands, but offer a low cost alternative to recirculating ball bearings. The low friction liner makes DryLin R suitable for wet or dirty enviornments.

Features

- Dimensionally interchangeable with ball bearings
- Available in four shaft diameters in both fixed and self-aligning housings
- Type J polymer is an excellent all-purpose sliding material
- Ideally suited to work with Drylin R hard-anodized aluminum shafting

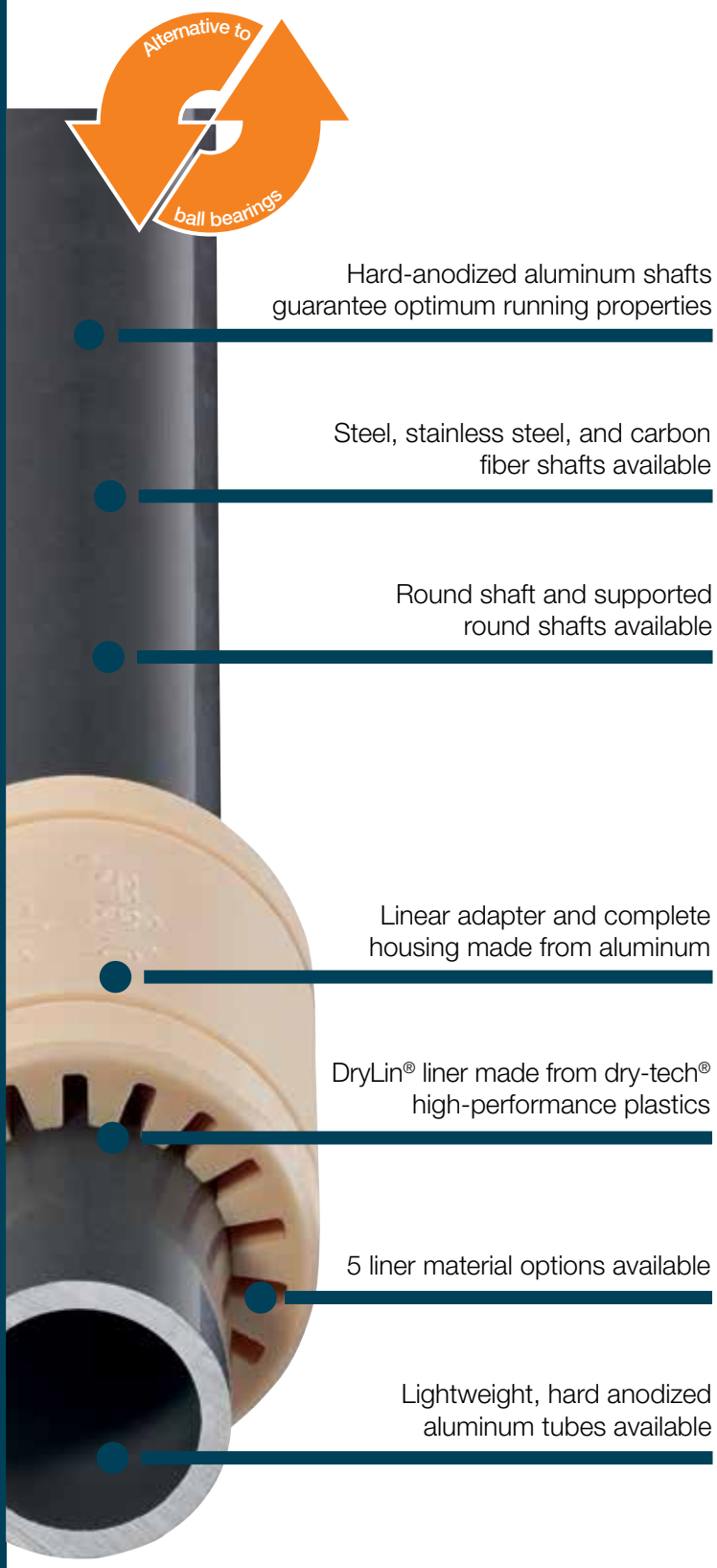
CE

igus® DryLin® R Linear Plain Bearings											
Item Photo	*Part Number*	*Housing Fit*	*Size I.D. (inch)*	*Length (inch)*	*Housing Type*	*Bearing Material*	*Housing Material*	*Qty. per Package*	*Weight (lb)*	*Price*	*Drawing Link*
	A-RJZI-01-04	Fixed housing	1/4	3/4	Closed	Type J polymer	Anodized aluminum	1	0.00	$2a7a:	PDF
	A-RJUI-01-08		1/2	1-1/4				1	0.04	$2a7b:	PDF
	A-RJUI-01-12		3/4	1-5/8				1	0.06	$2a7c:	PDF
	A-RJUI-01-16		1	2-1/4				1	0.23	$2a7d:	PDF
	A-RJI-01-08		1/2	1-1/4			Type J polymer	1	0.03	$2a7e:	PDF
	A-RJI-01-12		3/4	1-5/8				1	0.05	$;2a7f:	PDF
	A-RJI-01-16		1	2-1/4				1	0.11	$2a7g:	PDF
	A-OJUI-01-08		1/2	1-1/4	Open		Anodized aluminum	1	0.11	$2a7h:	PDF
	A-OJUI-01-12		3/4	1-5/8				1	0.06	$-2a7i:	PDF
	A-OJUI-01-16		1	2-1/4				1	0.23	$-2a7j:	PDF
	A-RJUI-03-08	Self-aligning housing	1/2	1-1/4	Closed			1	0.03	$2a7k:	PDF
	A-RJUI-03-12		3/4	1-5/8				1	0.06	$-2a7l:	PDF
	A-RJUI-03-16		1	2-1/4				1	0.11	$2a7n:	PDF
	A-OJUI-03-08		1/2	1-1/4	Open			1	0.11	$2a7o:	PDF
	A-OJUI-03-12		3/4	1-5/8				1	0.06	$2a7p:	PDF
	A-OJUI-03-16		1	2-1/4				1	0.23	$2a7q:	PDF
	A-FJUI-11-08	Fixed housing	1/2	1-11/16	4-bolt flange pillow block			1	0.18	$2a7s:	PDF
	A-FJUI-11-12		3/4	2-1/16				1	0.46	$;2a7t:	PDF
	A-FJUI-11-16		1	2-13/16				1	1.21	$2a7u:	PDF
	A-FJUI-13-08	Self-aligning housing	1/2	1-11/16				1	0.18	$2a7v:	PDF
	A-FJUI-13-12		3/4	2-1/16				1	0.46	$2a7x:	PDF
	A-FJUI-13-16		1	2-13/16				1	1.21	$2a7y:	PDF

DryLin® R Round Shaft Guide Systems

- Self-lubricating
- Maintenance-free
- Corrosion-free
- Resistant to dirt
- Low weight
- Dimensionally interchangeable with recirculating ball bearings

DryLin® R Round Shaft Guide Systems - Advantages



Self-lubricating round shaft guide systems – DryLin® R

DryLin® R is dimensionally interchangeable with linear ball bearings, but offers cleaner, more cost-effective results even in harsh environments. The standard RJUI/RJUM bearing consists of an iglide® J liner slip-fit into an aluminum housing. The unique grooved design of the J liner minimizes clearance, is suitable for use in extremely wet and dirty environments, and is easily replaceable. Dimensionally interchangeable 100% plastic parts RJI/RJM/RJIP/RJMP are also available for cost-savings, weight reduction, and other technical advantages. DryLin® R bearings may also be used with high temperature and chemically resistant iglide® T500 (X)* (TUI/TUM) liners for more demanding applications, and E7 material liners for steel and stainless shafting.

- 100% self-lubricating
- Dimensionally interchangeable with standard recirculating ball bearings
- Large variety of housing options
- Shafts, shaft-end supports and accessories available
- Replaceable bearing liner
- 300 series stainless steel housing available

Typical application areas:

- Packaging
- Lab
- Kiosk
- 3D Printing

max. +482°F (+250°C)
min. -130°F (-90°C)
(depending on material)

8 shaft materials
8 versions
Inner-Ø up to 60 mm

Inch dimensions available

Clean-Room
Cleanroom certified
IPA Fraunhofer

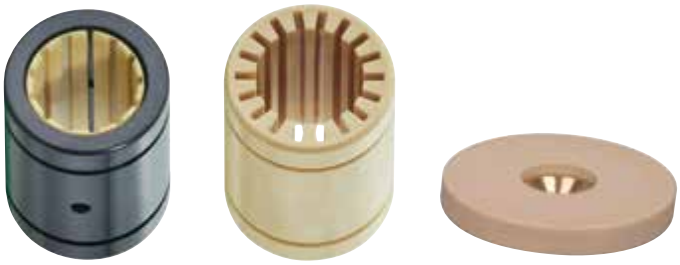
CE
Free of toxins
ROHS 2011/65/EU

ESD-compatible
(electrostatic discharge)

DryLin® R Round Shaft Guide Systems - Product overview

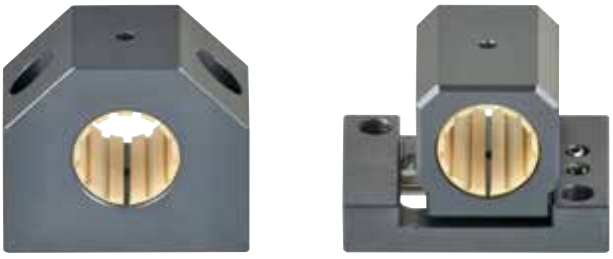
Liners and pressfit bearings

- Low friction, optimized wear quality
- Space saving, lightweight
- High chemical resistance



Linear plain bearing

- Aluminum or stainless steel adapter with iglide® material liner
- Solid iglide® plastic bearings available, dimensionally interchangeable with recirculating ball bearings
- Closed or open versions available
- Self-aligning
- Sliding discs available

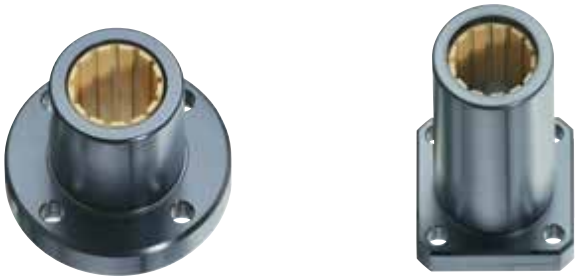


Pillow blocks and floating pillow blocks

- Easy to assemble
- Stands up to high static load
- Replaceable bearing liners
- Split housing for quick liner replacement available

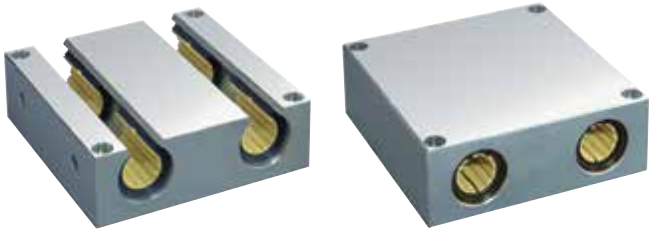
Open linear plain bearings

- For supported loads using supported shafting
- Round or mounted design
- Adjustable options
- Optional floating bearing for quick assembly and design optimization



Flange bearing

- Easy to fit
- Round or square options available
- Standard or twin flange designs



Quad block

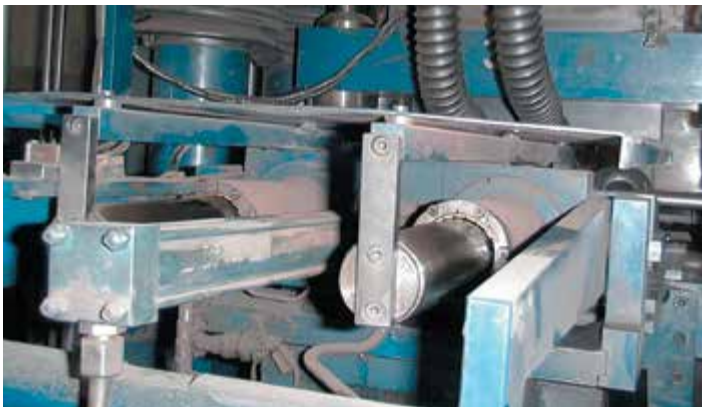
- Closed or open design options
- Quad block housing with 4 bearing liners
- Floating bearing available

DryLin® R - Application Examples

DryLin® R linear plain bearings on supported aluminum shafts are used in the guide for this cutting table. The DryLin® components stand up to the high levels of dust and dirt, and offer accurate, smooth operation.

This saw mill uses a DryLin® linear bearing with iglide® J plastic liner for the angle stops.

This heavy duty application has run reliably for more than three years thanks to DryLin® RJUM-01 linear bearings



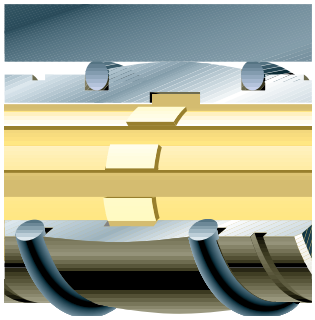
Despite the high stresses from abrasive particles and powder particles, this compactor unit can extend maintenance-free uptime by up to two years after switching to DryLin® R linear bearings.

Maintenance-free, precise, compact, and wear resistant bearing liners were mounted directly in the passages of this machine's frame.

To enable fast, and precise adjustment of a production line without the need for downtime, DryLin® precision linear guides were utilized.

DryLin® R - Technical data

DryLin® R linear plain bearings



The DryLin® standard round bearings consist of a replaceable iglide® J, J200, A180 or T500 (X)* bearing liner, manufactured to fit securely into an anodized aluminum bearing housing, axially secured via a snap ring groove. DryLin® linear bearings are designed as dimensionally interchangeable with standard ball bearings. Made of highly wear resistant iglide® J, J200, A180 or T500 (X)* materials, which offer technical advantages as well as cost savings. Plastic bearings are well suited for applications where machine components are primarily stainless steel, such as in food production and packaging equipment, as well as applications where weight savings are critical. DryLin® R linear plain bearings are designed to fit housings with our recommended tolerances, secured via circlips in the same way as ball bearings.

Dirt, dust, fibers

An important feature of all the linear plain bearings is their tolerance of dirt and other abrasive particles. For most conventional bearing systems, the use of wiper or seals is recommended to prevent the accumulation of dirt. With DryLin®, the patented design of the bearing surface, which uses connected slide pads, provides performance benefits for dirty environments. Dirt, even if it becomes wet on the shaft, is wiped away by the individual slide pads and is wiped to an open area. The running sections of the DryLin® bearings then slide on the shaft that has been cleared of all contaminants.

Split linear bearings

Applications on the edge of technical feasibility or in extreme environments often require frequent replacement of linear bearings. DryLin® linear bearings can provide significant increases in service life, and even when replacement is necessary, the replaceable bearing liners can offer substantial cost savings. Replacing only the bearing's liner can reduce maintenance time by 90%. The range of split bearing housings are easily opened, and the split shell means that the shafts are able to stay in place while a new bearing and liner can be installed around the shaft, keeping installation time to a minimum.

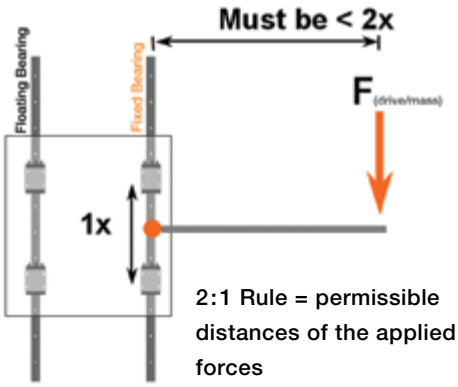
	 The "all-rounder" – iglide® J	 The specialist – iglide® J200	 The extreme – iglide® T500 (X)	 The marathon runner – iglide® E7	 FDA compliant – iglide® A180
Optimal shaft material(s)	all shaft materials	Aluminum, hard anodized	Hardened stainless steel Hard chromed plated steel	Steel stainless steel shaft	all shaft materials
Application temperature	-40°F to +194°F (-40°C to +90°C)	-40°F to +194°F (-40°C to +90°C)	-148°F to +482°F (-100°C to +250°C)	-40°F to +194°F (-40°C to +90°C)	-40°F to +194°F (-40°C to +90°C)
Best coefficient of friction with	Steel shaft	Aluminum, hard anodized	Steel hard chrome-plated	Steel stainless steel shaft	Stainless steel shaft
Maximum life time	Aluminum, hard anodized	Aluminum, hard anodized	Hardened stainless steel	Steel stainless steel shaft	Stainless steel shaft
Permissible stat. surface pressure	35 MPa	23 MPa	150 MPa	18 MPa	28 MPa
Moisture absorption	1.3% weight	0.7% weight	0.5% weight	< 0.1% weight	0.2% weight
Volume resistance	> 10^{13} Ωcm	> 10^{8} Ωcm	< 10^{5} Ωcm	> 10^{9} Ωcm	> 10^{12} Ωcm
Part No.	JUM-...	J200UM-...	TUM-.../XUM-...	E7UM-...	A180UM-...

DryLin® R - Design standards

Eccentric Forces

The 2:1 Rule

When using linear plain bearings it is important to ensure that the acting forces follow the 2:1 Rule (see drawing). If either the load or the drive force (F) is greater than twice the bearing length (1X), then a binding or interrupted motion may occur. If the location of the drive force or load cannot be changed, simply increase the distance between the bearings, or create a counterbalance to move the center-of-gravity back within the 2 to 1 ratio.



2:1 Rule = permissible distances of the applied forces

Fixed and Floating Bearing Mounting Instructions

When using systems with 2 parallel rails, one side must be designated as the “fixed” rail, and the opposite side as the “floating” rail.

Why use floating bearings?

- Promotes smooth gliding performance and maximizes bearing life
- Prevents binding caused by parallelism and angle errors
- Decreases necessary drive force and wear by minimizing friction-forces
- Enhances the precision of the system over the bearings’ lifetime.
- Reduce assembly time and co

Fixed Bearings

The “fixed” bearing rail should be positioned closest to the drive force. This rail will determine the precision of the system; no system should contain more than two “fixed” bearings.

Floating/Self-Aligning Bearings

The “floating” rail should be the rail located furthest from the drive force. It is to act only as a guide, and will compensate for any misalignments or angle errors in the system ensuring proper functionality.

Mounting Surfaces

The mounting surfaces for rails and bearings should have a very flat surface (e.g milled surface) in order to enhance performance. Variations in these surfaces may be compensated for by using floating bearings.

DryLin® R - Mounting Instructions

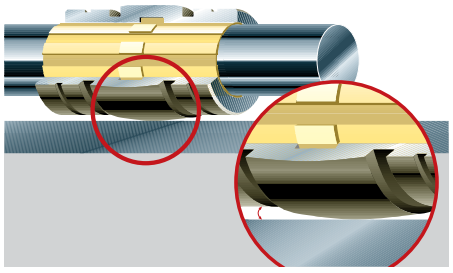
DryLin® R linear plain bearings in the 03 Design Series are self-aligning and offer great advantages in applications with parallel shafts. They are able to compensate for alignment and parallelism errors and should be used on the shaft located furthest from the drive mechanism.
The design provides a raised spherical area on the outer diameter of the aluminum adapter for self-alignment. Load capacity is the same as the fixed version.
Even in unfavorable edge-load conditions, the load is supported by the entire projected surface
In order to compensate for parallelism errors between two shafts, the outer diameter is designed to be smaller than the housing bore diameter by 0.2 - 0.3 mm (depending on the size). With the use of mounted O-rings, these bearings have an elastic bearing seat.

Compensation for angle errors

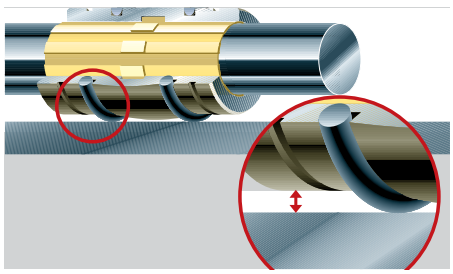
Series RJUI/RJUM/OJUI/OJUM-03 ±0.5°
Series RJUM-06-LL/OJUM-06-LL ±3.5°

Compensation of parallelism errors

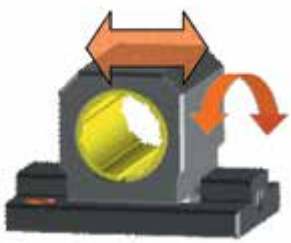
Series RJUI/RJUM/OJUI/OJUM-03 ±0.1 mm (.004”)
Series RJUM-06-LL/OJUM-06-LL ±3 mm (.12”)



The spherical DryLin® adapters can compensate for alignment errors. A hard-anodization protects the aluminum adapter from wear.



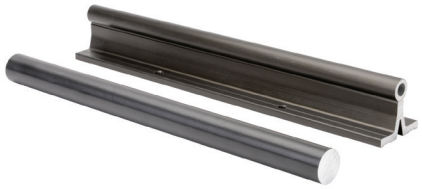
With built in clearances and the use of O-rings, the self-aligning DryLin® R bearings of the 03 Design Series can compensate for parallelism errors.



The self-aligning DryLin® R bearings of the 06 LL design series can compensate parallelism errors up to ± .12” (3mm).

DryLin® R Hard-Anodized Shafts

igus® DryLin® R hard-anodized shafts were specifically developed as the optimal sliding surface for DryLin R linear bearings. Available in four diameters and three lengths of both round shafting and fully supported shafting.



Features

- 6061-T6 aluminum hard-anodized to 450-550 HV surface hardness
- Round and fully supported styles
- Four diameters and three lengths up to 1000mm
- Best choice of shafting to use with DryLin R bearings

CE

igus® DryLin® R Hard-Anodized Shafts										
Item Photo	*Part Number*	*Shaft Type*	*Diameter (inch)*	*Length (mm)*	*Material*	*Surface Hardness*	*Qty. per Package*	*Weight (lb)*	*Price*	*Drawing Link*
	A-AWUI-08-250	Supported	1/2	250	Hard-anodized aluminum	450-550 HV	1	0.54	$2a7z:	PDF
	A-AWUI-08-500			500			1	1.07	$;2a7]:	PDF
	A-AWUI-08-1000			1000			1	2.13	$;2a7[:	PDF
	A-AWUI-12-250		3/4	250			1	0.92	$2a7_:	PDF
	A-AWUI-12-500			500			1	1.85	$2a7#:	PDF
	A-AWUI-12-1000			1000			1	3.67	$;02a7!:	PDF
	A-AWUI-16-250		1	250			1	1.23	$2a7?:	PDF
	A-AWUI-16-500			500			1	2.46	$;2a7,:	PDF
	A-AWUI-16-1000			1000			1	4.92	$02a80:	PDF
	A-AWI-04-250	Round	1/4	250			1	0.05	$2a81:	PDF
	A-AWI-04-500			500			1	0.10	$2a82:	PDF
	A-AWI-04-1000			1000			1	0.20	$2a83:	PDF
	A-AWI-08-250		1/2	250			1	0.19	$2a84:	PDF
	A-AWI-08-500			500			1	0.39	$2a85:	PDF
	A-AWI-08-1000			1000			1	0.77	$2a86:	PDF
	A-AWI-12-250		3/4	250			1	0.43	$2a87:	PDF
	A-AWI-12-500			500			1	0.87	$2a88:	PDF
	A-AWI-12-1000			1000			1	1.73	$2a89:	PDF
	A-AWI-16-250		1	250			1	0.77	$2a8a:	PDF
	A-AWI-16-500			500			1	1.53	$2a8b:	PDF
	A-AWI-16-1000			1000			1	3.05	$2a8c:	PDF

DryLin® Shafting

- Available in supported versions
- Aluminum for low weight
- Diameters 1/2 - 1 inch

DryLin® Shafts

	 The "all-rounder" – iglide® J	 The specialist – iglide® J200	 The extreme – iglide® T500 (X)*	 The marathon runner – iglide® E7	 FDA compliant – iglide® A180
Optimal shaft material(s)	all shaft materials	Aluminum, hard anodized	Hardened stainless steel Hard chromed plated steel	Steel stainless steel shaft	all shaft materials
Application temperature	-40°F to +194°F (-40°C to +90°C)	-40°F to +194°F (-40°C to +90°C)	-148°F to +482°F (-100°C to +250°C)	-40°F to +194°F (-40°C to +90°C)	-40°F to +194°F (-40°C to +90°C)
Best coefficient of friction with	Steel shaft	Aluminum, hard anodized	Steel, hard chrome-plated, SS	Steel stainless steel shaft	Stainless steel shaft
Maximum life time	Aluminum, hard anodized	Aluminum, hard anodized	Hardened stainless steel	Steel stainless steel shaft	Stainless steel shaft
Permissible stat. surface pressure	35 MPa	23 MPa	150 MPa	18 MPa	28 MPa
Moisture absorption	1.3% weight	0.7% weight	0.5% weight	< 0.1% weight	0.2% weight
Volume resistance	> 10^{13} Ωcm	> 10^{8} Ωcm	< 10^{5} Ωcm	> 10^{9} Ωcm	> 10^{12} Ωcm
Part No.	JUM-...	J200UM-...	TUM-.../XUM-...	E7UM-...	A180UM-...

Available shaft materials:

Aluminum

- Ideal in combination with liners made from iglide® J/J200
- Lightweight
- Lower wear
- Corrosion resistant
- Available from stock

Steel

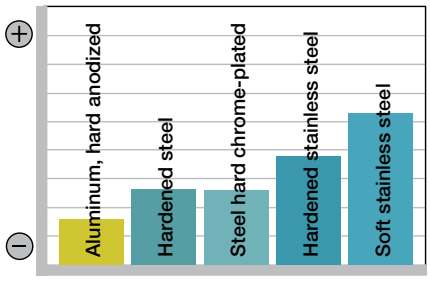
- Ideal with E7 liner
- Low-priced standard
- High load capacity
- Dry area applications
- Hard chrome-plated also available
- Lower coefficient of friction against plastic bearings

Stainless steel

- Ideal with E7 liner
- High corrosion resistance
- High chemical resistance
- Ideal solution for wet applications
- 300 series for extremely chemical intensive applications

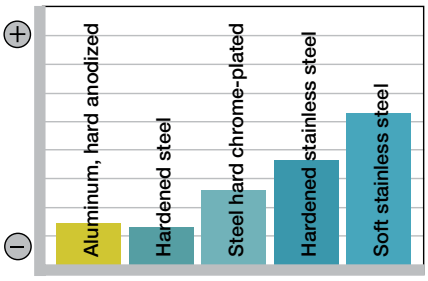
Please remember that this is a technical surface.
Small color variations are possible due to variable coating depths.

Wear



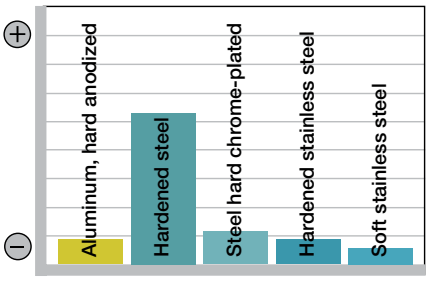
iglide ®J against particular shaft materials

Coefficient of friction



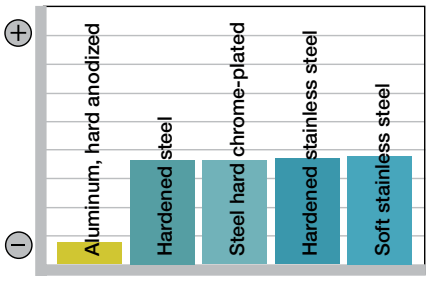
iglide ®J against particular shaft materials

Corrosion

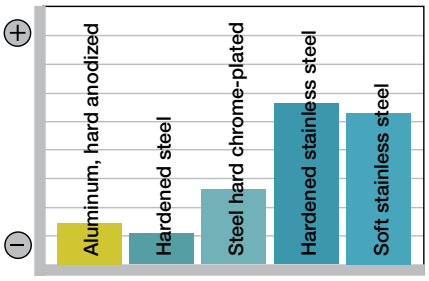


iglide ®J against particular shaft materials

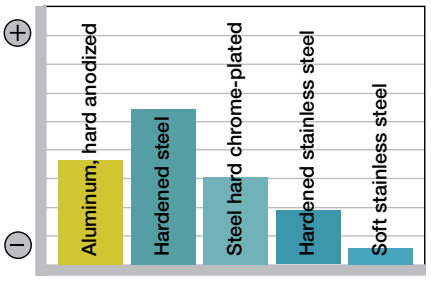
Weight



Costs



Chemical contamination



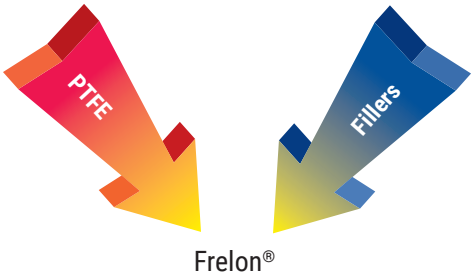
*X is the European equivalent material for iglide® T500

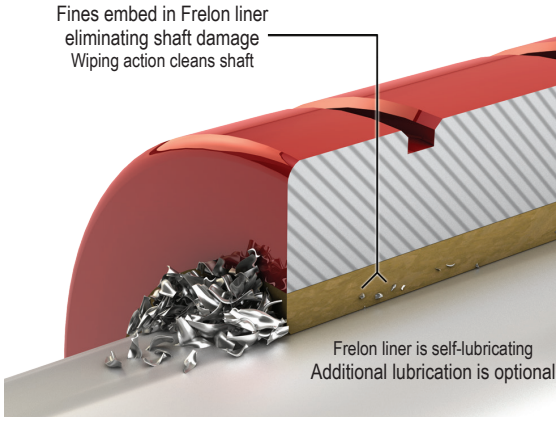
PBC Linear

Frelon GOLD®

What is FrelonGOLD?

FrelonGOLD is a compound of Polyterafluoroethylene (PTFE) and fillers developed for improved performance over other bearings. They provide low wear, low friction, self-lubrication, and high strength.

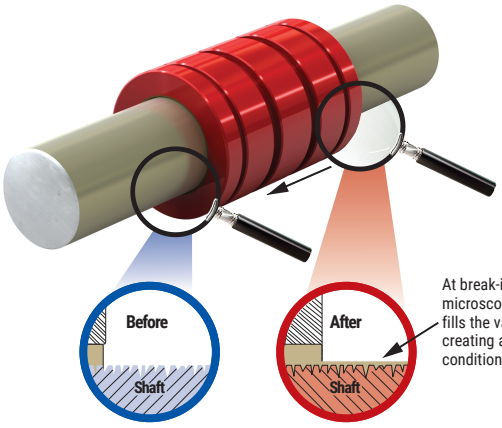




Transfer Process of Liner to Shaft

The interaction of the Frelon® material and the shafting creates a natural, microscopic transfer of the Frelon to the running surface. A thin film is deposited on the shaft, and the valleys in the surface finish are filled in with Frelon material during the initial break-in period. This transfer creates the self-lubricating condition of Frelon riding on Frelon. This break-in period varies depending on several criteria:

1. Preparation of the shafting prior to installation – it is best to clean the shafting with a 3-in-1 type oil before installing the bearings. This ensures that the surface will receive a full transfer of material.
2. Speed, load, and length of stroke specific to the application – typically the initial transfer process will take approximately 50-100 strokes of continuous operation. The running clearance on the bearing will increase an average of 0.0002" to 0.0005", depending on the length of the stroke and surface requiring the transfer.
3. How often the shafting is cleaned – if the shafting is cleaned regularly, increased wear will be seen in the bearings. This is due to the transfer process being performed over and over again.



Performance Ratings (for Linear Motion)

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

(-)C_o = Static Load on bearing

A = Bearing effective surface area

V = velocity (speed) in ft/min (m/min.)

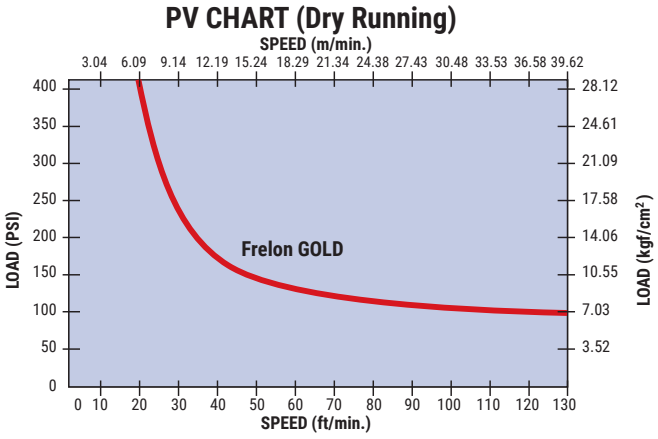
P = Pressure on Bearing = C_o/A

PV = Pressure Velocity

PV_{max}	P_{max}	V_{max}		
		No Lube Continuous Motion	*No Lube Intermittent Motion*	*With Lubrication**
20000 (psi x ft./min.)	3000 psi	300 ft/min	825 ft/min	825 ft/min
430 (kgf/cm2 x m/min.)	210.9 kgf/cm2	1.524 m/sec.	4.19 m/sec.	4.19 m/sec.

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

FrelonGOLD not recommended for use with deionized water and other harsh chemicals. See the chemical reaction chart



Recommended Lubricants:

- Waylube oil
- Light weight oils
- Petroleum based grease
- 3-in-1 oils

Not Recommended Lubricants:

- WD-40
- PTFE sprays
- Fluorocarbons
- Silicon oils

Prior to use, it is best to clean the rail with a 3-in-1 type oil before installing the carriages. This ensures that the surface will receive a full transfer of Frelon material during break-in

PBC Linear®

PBC Simplicity® Plain Bearings

PBC Linear Plain Bearing Features

- Class III Plain Bearing
- Self-lubricating
- Maintenance free
- Coefficient of friction: 0.125
- Temperature range: ± 400° F
- Bearing Liner Material: FrelonGOLD® (PTFE)
- Bearing Shell Material: Aluminum Alloy with anodized finish
- For Linear, oscillating, rotary motion, or combination of all 3

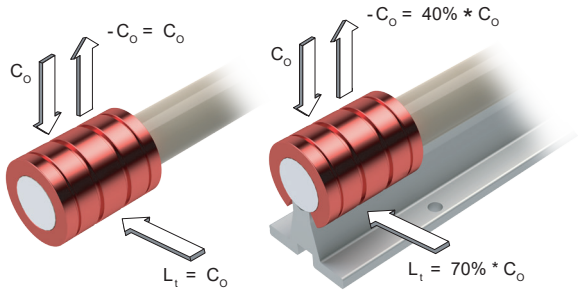
Closed Bearing

Open Bearing

Simplicity Series Plain Bearings

Part Number	Price	Nominal ID	Bearing Form Factor	Effective Surface Area (A)	Running Clearance (Both Sides)	Max Static Load Rating (C_0)	Drawing Links
FL04	$5#n8:	1/4 in	closed	0.20 in^2	0.0005 in	600 lbs	PDF
FL06	$5#n9:	3/8 in		0.34 in^2		1020 lbs	PDF
FL08	$5#na:	1/2 in		0.65 in^2		1950 lbs	PDF
FL10	$5#nb:	5/8 in		0.98 in^2		2940 lbs	PDF
FL12	$5#nc:	3/4 in		1.27 in^2		3810 lbs	PDF
FL16	$5#nd:	1 in		2.35 in^2		7050 lbs	PDF
FL20	$5#ne:	1 1/4 in		3.43 in^2		10830 lbs	PDF
FLN08	$5#n?:	1/2 in	open	0.65 in^2		1950 lbs	PDF
FLN10	$;5#n,:	5/8 in		0.98 in^2		2940 lbs	PDF
FLN12	$5#o0:	3/4 in		1.27 in^2		3810 lbs	PDF
FLN16	$5#o1:	1 in		2.35 in^2		7050 lbs	PDF
FLN20	$5#o3:	1 1/4 in		3.43 in^2		10830 lbs	PDF
FLC04	$;5#nf:	1/4 in	closed	0.20 in^2	0.0015 in	600 lbs	PDF
FLC06	$5#ng:	3/8 in		0.34 in^2		1020 lbs	PDF
FLC08	$5#nh:	1/2 in		0.65 in^2		1950 lbs	PDF
FLC10	$-5#ni:	5/8 in		0.98 in^2		2940 lbs	PDF
FLC12	$-5#nj:	3/4 in		1.27 in^2		3810 lbs	PDF
FLC16	$5#nk:	1 in		2.35 in^2		7050 lbs	PDF
FLC20	$-5#nl:	1 1/4 in		3.43 in^2		10830 lbs	PDF
FLCN08	$5#o4:	1/2 in	open	0.65 in^2		1950 lbs	PDF
FLCN10	$5#o5:	5/8 in		0.98 in^2		2940 lbs	PDF
FLCN12	$5#o6:	3/4 in		1.27 in^2		3810 lbs	PDF
FLCN16	$5#o7:	1 in		2.35 in^2		7050 lbs	PDF
FLCN20	$5#o8:	1 1/4 in		3.43 in^2		10830 lbs	PDF

Compensated plain bearings may feel too loose when installed. This is normal, and required, to prevent binding when used with dual shafts



Running Clearance

Simplicity bearings are available with two classes of running clearance:

Precision–"FL":

- Performs like a preloaded ball bearing
- Tightest running clearance approximately 0.001" (0.025 mm)
- Used in applications that require high precision

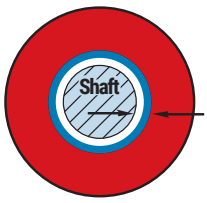
Not recommended for all parallel shaft applications. Any misalignment can cause binding on the shaft.
Recommend: Compensated–"FLC" (see below).

Compensated–"FLC":

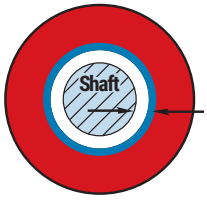
- Performs like a standard ball bearing
- Additional clearance built into the I.D.–all other dimensions are the same as the precision bearings
- Ideally suited for parallel shaft applications

Many parallel shaft applications will run "FL" precision on one rail and "FLC" compensation on the opposite rail to accommodate slight misalignments.

RUNNING CLEARANCE



Standard "FL"
Performs like a preloaded linear ball bearing
0.0005" per side clearance average (0.0127 mm)



Compensated "FLC"
Performs like a standard linear ball bearing
0.0015" + per side clearance average (0.0381 + mm)

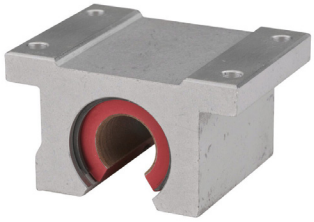
PBC Linear®

PBC Simplicity® Pillow Blocks

PBC Linear Simplicity Pillow Block Features

- Simplicity Plain Bearing Pre-installed
- Pillow Block Housing Material: Aluminum alloy with clear anodize finish
- Centerline tolerance: ± 0.001"
- Internal self-aligning feature provides ± 1/2° bearing movement in all directions allowing for some shaft deflection and misalignment

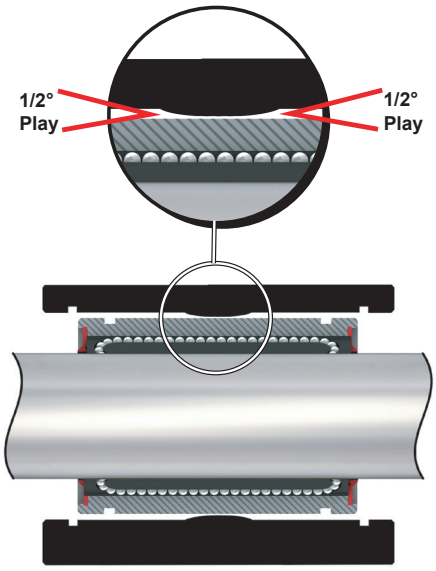
Closed Bearing



Open Bearing

Simplicity Pillow Block

Part Number	Price	Nominal ID	Installed Bearing	Form Factor	Effective Surface Area (A)	Running Clearance (Both Sides)	Max Static Load Rating (C_0)	Drawing Links
P04	$-5#lh:	1/4in	FL04	closed type	0.20 in^2	0.0005 in	600 lbs	PDF
P06	$--5#li:	3/8in	FL06		0.34 in^2		1020 lbs	PDF
P08	$--5#lj:	1/2in	FL08		0.65 in^2		1950 lbs	PDF
P10	$-5#lk:	5/8in	FL10		0.98 in^2		2940 lbs	PDF
P12	$--5#ll:	3/4in	FL12		1.27 in^2		3810 lbs	PDF
P16	$-05#lc:	1in	FL16		2.35 in^2		7050 lbs	PDF
P20	$-05#ld:	1-1/4in	FL20		3.43 in^2		10830 lbs	PDF
PN08	$-5#ls:	1/2in	FLN08	open type	0.65 in^2		1950 lbs	PDF
PN10	$;-5#lt:	5/8in	FLN10		0.98 in^2		2940 lbs	PDF
PN12	$-5#lu:	3/4in	FLN12		1.27 in^2		3810 lbs	PDF
PN16	$-05#lv:	1in	FLN16		2.35 in^2		7050 lbs	PDF
PN20	$-05#lx:	1-1/4in	FLN20		3.43 in^2		10830 lbs	PDF
P04C	$-5#le:	1/4in	FLC04	closed type	0.20 in^2	0.0015 in	600 lbs	PDF
P06C	$;-5#lf:	3/8in	FLC06		0.34 in^2		1020 lbs	PDF
P08C	$-5#lg:	1/2in	FLC08		0.65 in^2		1950 lbs	PDF
P10C	$-5#ln:	5/8in	FLC10		0.98 in^2		2940 lbs	PDF
P12C	$-5#lo:	3/4in	FLC12		1.27 in^2		3810 lbs	PDF
P16C	$-05#lp:	1in	FLC16		2.35 in^2		7050 lbs	PDF
P20C	$-05#lq:	1-1/4in	FLC20		3.43 in^2		10830 lbs	PDF
PN08C	$-5#ly:	1/2in	FLCN08	open type	0.65 in^2		1950 lbs	PDF
PN10C	$-5#lz:	5/8in	FLCN10		0.98 in^2		2940 lbs	PDF
PN12C	$;-5#l]:	3/4in	FLCN12		1.27 in^2		3810 lbs	PDF
PN16C	$;-05#l[:	1in	FLCN16		2.35 in^2		7050 lbs	PDF
PN20C	$-05#l_:	1-1/4in	FLCN20		3.43 in^2		10830 lbs	PDF



Internal Self-aligning Feature

FrelonGOLD® not recommended for use with deionized water and other harsh chemicals. See the chemical reaction chart page tLMN-84

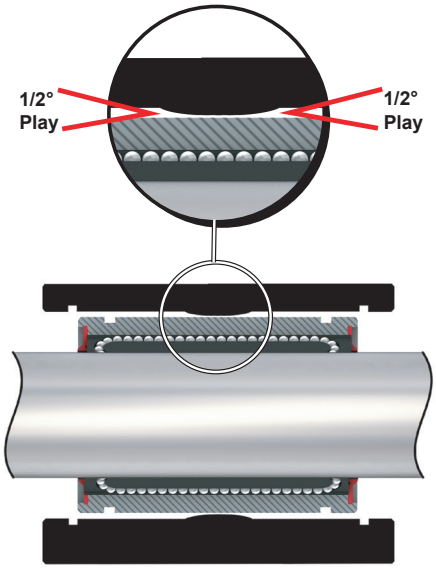
PBC Linear®

PBC Simplicity® Flange Mount Bearings

PBC Linear Simplicity Flange Mount Features

- Simplicity Plain Bearing Pre-installed
- Flange Mount Housing Material: Aluminum alloy with clear anodize finish
- Internal self-aligning feature provides ± 1/2° bearing movement in all directions allowing for some shaft deflection and misalignment

Simplicity Flange Mount Bearing							
Part Number	*Price*	*Nominal ID*	*Installed Bearing*	*Effective Surface Area (A)*	*Running Clearance (Both Sides)*	*Max Static Load Rating (C_o)*	*Drawing Links*
SFP06	$05#nn:	3/8 in	SFP06	0.34 in^2	0.0005 in	1020 lbs	PDF
SFP08	$5#no:	1/2 in	SFP08	0.65 in^2		1950 lbs	PDF
SFP12	$5#np:	3/4 in	SFP12	1.27 in^2		3810 lbs	PDF
SFP16	$05#nq:	1 in	SFP16	2.35 in^2		7050 lbs	PDF
SFP20	$05#ns:	1 1/4 in	SFP20	3.43 in^2		10830 lbs	PDF
SFP06C	$;05#nt:	3/8 in	SFP06C	0.34 in^2	0.0015 in	1020 lbs	PDF
SFP08C	$5#nv:	1/2 in	SFP08C	0.65 in^2		1950 lbs	PDF
SFP12C	$5#nx:	3/4 in	SFP12C	1.27 in^2		3810 lbs	PDF
SFP16C	$05#ny:	1 in	SFP16C	2.35 in^2		7050 lbs	PDF
SFP20C	$05#nz:	1 1/4 in	SFP20C	3.43 in^2		10830 lbs	PDF



Internal Self-aligning Feature

FrelonGOLD® not recommended for use with deionized water and other harsh chemicals. See the chemical reaction chart page tLMN-84

PBC Linear

PBC Linear Guides

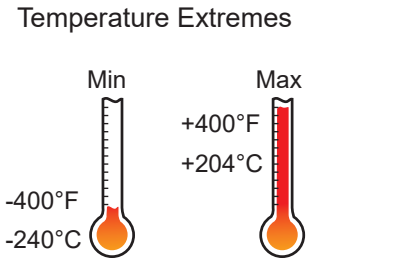
Product Overview

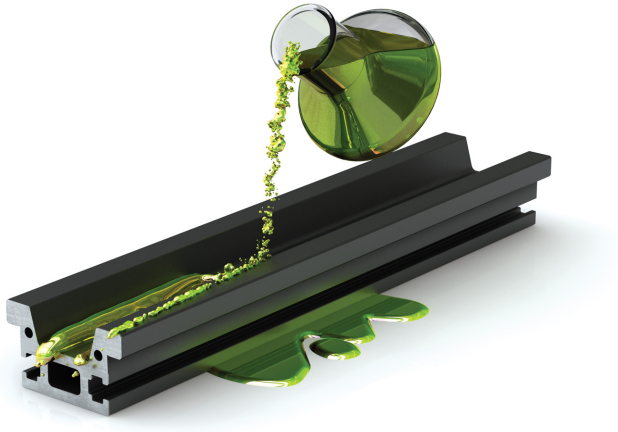
- Ceramic coated aluminum guide track with anodized aluminum carriage
- Guide tracks & Carriages made of 6061-T6 AL
- Self-lubricating FrelonGOLD® Plain Bearing bonded to carriage
- Smooth & quiet operation
- Vibration damping & shock resistant
- No lubricant required
- Maintenance free bearing surface
- Carriage Static Load Rating up to 8,200 N (1,843 lbf)
- Operates within a wide temperature range -400°F to 400°F (-240°C to 204°C)
- Available Lengths up to 2000mm
- 7 available Sizes

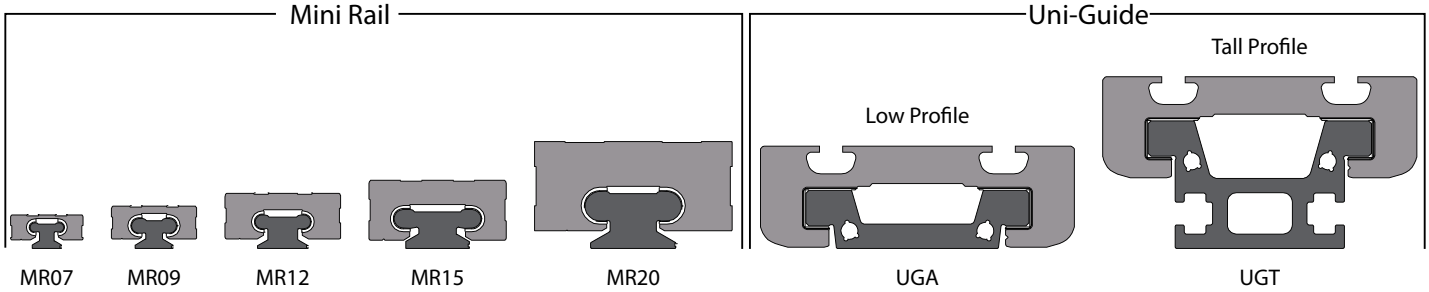
Designed to provide smooth, maintenance-free linear motion in various demanding applications!

Applications

- Contaminated environments
- Clean rooms
- Washdown & submerged conditions
- Medical Device Assembly
- Packaging
- Food Processing
- Printing
- Electronics assembly







Parts are shown in relative scale

PBC Linear

Mini-Rail

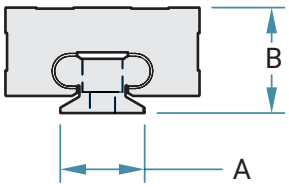
Features & Benefits

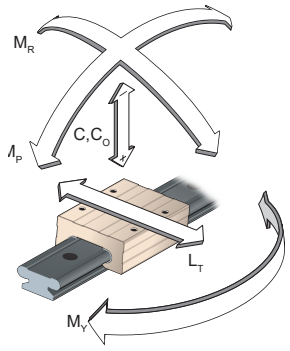
- Carriage included with guide track
- Compact design with a small footprint
- Guide track Material: 6061-T6 Aluminum with ceramic coating
- Carriage Material: 6061-T6 Aluminum with anodized finish
- Bearing Material: FrelonGold®
- FrelonGold Coefficient of Friction = 0.125
- Running Clearance = 0.025 - 0.051mm
- Available in five sizes: 7, 9, 12, 15, and 20 mm
- Available in lengths up to 500 mm

MR07-0100-1

Mini-Rail Specifications

Part Number	Price	Series Size (A)	Overall Height (B)	Guide track Length	Frelon Effective Area	Load Ratings						Drawing Links
						N			N·m			
						Static (Co)	Reverse Static (-Co)	Lateral (Lt)	Pitch Moment (MP)	Yaw Moment (My)	Roll Moment (MR)	
MR07-0100-1	$;6f94:	7 mm	8 mm	100 mm	0.14 in^2	445	89	133	1.8	2.3	1.8	PDF
MR07-0150-1	$;6f95:			150 mm								PDF
MR09-0100-1	$;6f96:	9 mm	10 mm	100 mm	0.267 in^2	667	125	222	3.2	5	3.2	PDF
MR09-0150-1	$;6f97:			150 mm								PDF
MR12-0100-1	$;6f98:	12 mm	13 mm	100 mm	0.288 in^2	1334	222	400	5.6	9	5.6	PDF
MR12-0150-1	$;6f99:			150 mm								PDF
MR12-0200-1	$;6f9a:			200 mm								PDF
MR15-0150-1	$;6f9b:	15 mm	16 mm	150 mm	0.47 in^2	2224	356	667	9	15.1	9	PDF
MR15-0300-1	$;6f9c:			300 mm								PDF
MR15-0400-1	$;6f9d:			400 mm								PDF
MR20-0250-1	$;6f9e:	20 mm	25 mm	250 mm	1.069 in^2	3559	578	1112	14.7	24.9	14.7	PDF
MR20-0400-1	$;;06f9f:			400 mm								PDF
MR20-0500-1	$;06f9g:			500 mm								PDF





Prior to use, it is best to clean the guide track with a 3-in-1 type oil before installing the carriages. This ensures that the surface will receive a full transfer of Frelon material during break-in.

PBC Linear

Uni-Guides™

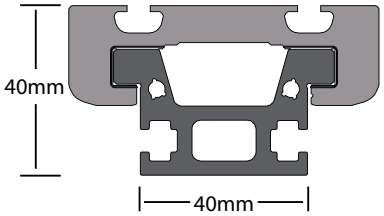
Features & Benefits

- Carriage included with guide track in either Low or Tall profile version
- Temperature range +/- 400°F (+/- 240°C)
- Guide track Material: 6061-T6 Aluminum with ceramic coating
- Carriage Material: 6061-T6 Aluminum with anodized finish
- Bearing Material: FrelonGold®
- FrelonGold Coefficient of Friction = 0.125
- Running Clearance = 0.064 - 0.089mm
- Lengths up to 2000 mm
- Tall and low profiles available

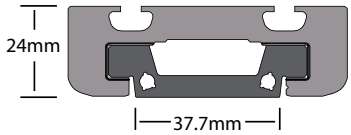
UGT040-0400-0C1G00-1

UGA040-0400-0C1G00-1

Tall Profile (UGTxxx)



Low Profile (UGAxxx)



Uni-Guide Specifications

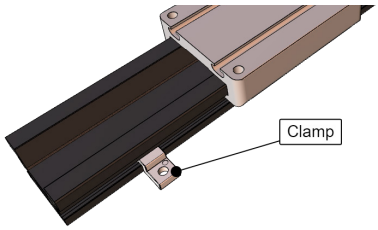
Part Number	Price	Profile	Guide track Length	Frelon Effective Area	Load Ratings						Drawing Links
					N			N·m			
					Static (Co)	Reverse Static (-Co)	Lateral (Lt)	Pitch Moment (MP)	Yaw Moment (My)	Roll Moment (MR)	
UGA040-0400-0C1G00-1	$;06f9h:	Low*	400 mm	0.93 in²	8200	2700	4900	170	170	120	PDF
UGA040-1000-0C1G00-1	$;-06f9i:		1000 mm								PDF
UGA040-1500-0C1G00-1	$;-06f9j:		1500 mm								PDF
UGA040-2000-0C1G00-1	$;06f9k:		2000 mm								PDF
UGT040-0400-0C1G00-1	$;-06f9l:	Tall**	400 mm								PDF
UGT040-1000-0C1G00-1	$;06f9n:		1000 mm								PDF
UGT040-1500-0C1G00-1	$;06f9o:		1500 mm								PDF
UGT040-2000-0C1G00-1	$;06f9p:		2000 mm								PDF

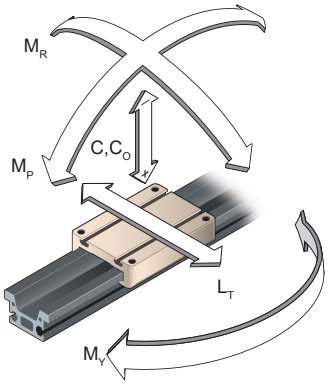
*Low profile (UGA) Uni-Guides can be mounted using M6 or 1/4-20 screws in the center of the Guide Track. See Drawing Link above for more details.
**Tall profile (UGT) Uni-Glides require a minimum of four (4) mounting clamps.

Uni-Guide Mounting Clamps

Part Number	Price	Description	Drawing Links
UGT040A-TC-1	$;6f9q:	PBC mounting clamp, 1 hole. For use with PBC UGT040-xxxx guide tracks.	PDF
UGT040A-TC-2	$;6f9s:	PBC mounting clamp, 2 holes. For use with PBC UGT040-xxxx guide tracks.	PDF

UGT040A-TC-1





Prior to use, it is best to clean the guide track with a 3-in-1 type oil before installing the carriages. This ensures that the surface will receive a full transfer of Frelon material during break-in.

PBC Linear

Chemical Reaction Chart for Simplicity® Bearings

The FrelonGOLD® 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 0.002" 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.

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.

Performance	Wear
E = Excellent	< 0.002" per year
G = Good	< 0.020" per year
S = Satisfactory	< 0.050" per year
U = Unsatisfactory	> 0.040" per year

Chemical	Frelon GOLD	Bare Aluminum	Standard & Hard Coat Anodized Aluminum	316 Stainless Steel
Acetic Acid, 20%	U	G	G	E
Acetone	G	E	E	E
Ammonia, Anhydrous	G	E	E	E
Ammonium Hydroxide, 10%	U	U	U	E
Ammonium Chloride, 10%	U	U	U	G
Ammyl Acetate (122°F / 50°C)	G	E	E	E
Barium Hydroxide	U	U	U	G
Beer	G	E	E	E
Boric Acid Solutions	G	E	E	G
Butane	G	G	G	G
Calcium Chloride, 20%	G	G	G	G
Calcium Hydroxide, 10%	G	G	G	G
Carbon Dioxide	G	E	E	G
Carbon Monoxide	G	E	E	E
Chlorine Gas, Dry	G	G	G	G
Chlorine Gas, Wet	U	U	U	U
Chromic Acid, 10%	U	G	E	E
Citric Acid, 5%	G	E	E	E
Ethyl Acetate	G	E	E	G
Ethyl Alcohol	G	E	E	G
Ethylene Glycol	G	E	E	G
Ferric Chloride, 50%	U	U	U	U
Formic Acid - Anhydrous	U	E	E	E
Gasoline, Unleaded	G	G	G	G
Hydrochloric Acid, 20%	U	U	U	U
Hydrochloric Acid, 35%	U	U	U	U
Hydrocyanic Acid, 10%	U	G	G	G
Hydrofluoric Acid - Dilute	U	U	U	U
Hydrofluoric Acid, 48%	U	U	U	U
Hydrogen	G	E	E	E
Hydrogen Peroxide - Dilute	U	E	E	G

Chemical	Frelon GOLD	Bare Aluminum	Standard & Hard Coat Anodized Aluminum	316 Stainless Steel
Hydrogen Sulfide, Dry	U	G	E	E
JP-4	G	G	G	G
Kerosene	G	G	G	G
Lacitic Acid, 10%	G	G	G	E
Magnesium Chloride, 50%	G	U	U	G
Mercury	U	U	U	E
Methyl Alcohol	G	G	G	G
Methyl Ethyl Ketone	G	G	G	G
Methylene Chloride	G	E	E	G
Mineral Oil	G	G	G	G
Naptha	G	G	G	G
Nitric Acid, 70%	U	U	U	E
Phosphoric Acid, 10%	U	U	U	E
Sodium Chloride	G	U	U	E
Sodium Hydroxide, 20%	G	U	U	G
Sodium Hypochlorite, 20%	U	G	G	U
Sodium Peroxide, 10%	U	G	G	G
Steam (see water)	-	-	-	-
Sulfur Dioxide, Wet	U	U	U	G
Sulfur Dioxide, Dry	G	G	G	G
Sulfur Trioxide	U	G	G	G
Sulfuric Acid, 50%	U	U	U	U
Sulfurous Acid	U	G	G	E
Toluene (122°F / 50°C)	G	E	E	E
Turpentine	G	G	E	E
Water, Demineralized	U	G	E	E
Water, Distilled	G	U	S	G
Sea Water	G	G	E	G
Water, Sewage	G	U	S	G
Xylene	G	G	G	G
Zinc Chloride Solutions	U	U	U	G

PBC Linear

PBC Linear Ball Bearings

High Precision and Rigidity

The 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.

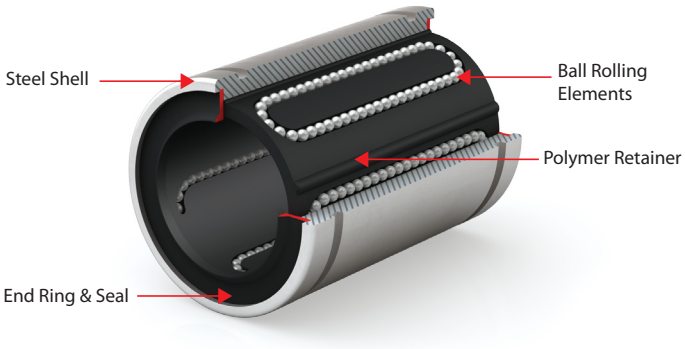
Ease of Replacement

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.

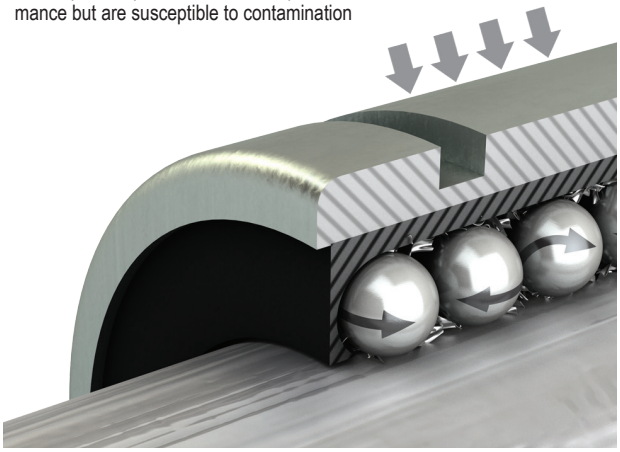
Materials

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.



Ball Bearing
Better performance for moment loading
Balls provide precise, low-friction performance but are susceptible to contamination



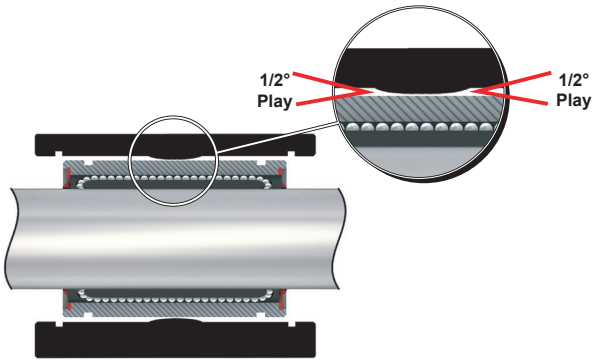
Pillow Blocks and Flange Mounts

- Made of aluminum alloy
- Clear anodized finish (Standard)
- Pillow blocks are interchangeable with industry standard ball bearing pillow blocks
- Critical centerline dimensions hold accuracy within ±0.001".

Self-Alignment

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



PBC Linear

PBC Linear Ball Bearings

PBC Linear Ball Bearing Features

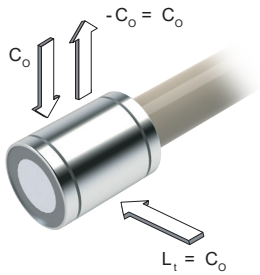
- For Linear, oscillating, rotary motion, or combination of all 3
- End Seals included
- Bearing Shell Material: GCr15 Steel, heat treated
- Bearing Material: GCr15 Steel
- Bearing Retainer Material: Polyoxymethylene polymer
- Lubrication required

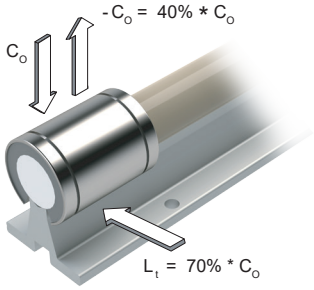
Closed Bearing

Open Bearing

Performance Ratings (for Linear Motion)

- Coefficient of friction: 0.05
- Maximum Speed (V_{max}): 590 ft/min
- IP04G-xx thru IP16G-xx ID tolerance: 0/-0.0005”
- IP20G-xx ID tolerance: 0/-0.0006”





PBC Linear Ball Bearing								
Part Number	*Price*	*Nominal ID*	*Bearing Form Factor*	*OD*	*Overall Length*	*Static Load Rating (C_0)*	*Dynamic Load Rating (C)*	*Drawing Links*
IP04G	$5#nu:	1/4 in	closed	1/2 in	3/4in	59 lbs	46 lbs	PDF
IP06G	$;5#n]:	3/8 in		5/8 in	7/8in	70 lbs	50 lbs	PDF
IP08G	$;5#n[:	1/2 in		7/8 in	1-1/4in	178 lbs	114 lbs	PDF
IP10G	$5#n_:	5/8 in		1 1/8 in	1-1/2in	265 lbs	174 lbs	PDF
IP12G	$5#n#:	3/4 in		1 1/4 in	1-5/8in	307 lbs	193 lbs	PDF
IP16G	$;5#n!:	1 in		1 9/16 in	2-1/4in	352 lbs	220 lbs	PDF
IP20G	$5#o2:	1 1/4 in		2 in	2-5/8in	615 lbs	352 lbs	PDF
IP08G-OP	$5#o9:	1/2 in	open	7/8 in	1-1/4in	178 lbs	114 lbs	PDF
IP10G-OP	$5#oa:	5/8 in		1 1/8 in	1-1/2in	265 lbs	174 lbs	PDF
IP12G-OP	$5#ob:	3/4 in		1 1/4 in	1-5/8in	307 lbs	193 lbs	PDF
IP16G-OP	$5#oc:	1 in		1 9/16 in	2-1/4in	352 lbs	220 lbs	PDF
IP20G-OP	$5#od:	1 1/4 in		2 in	2-5/8in	615 lbs	352 lbs	PDF

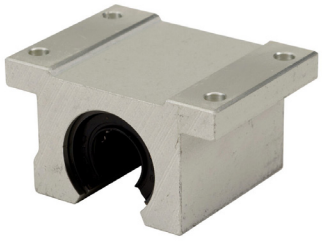
PBC Linear

PBC Linear Ball-Bearing Pillow Blocks

PBC Linear Ball Bearing Pillow Block Features

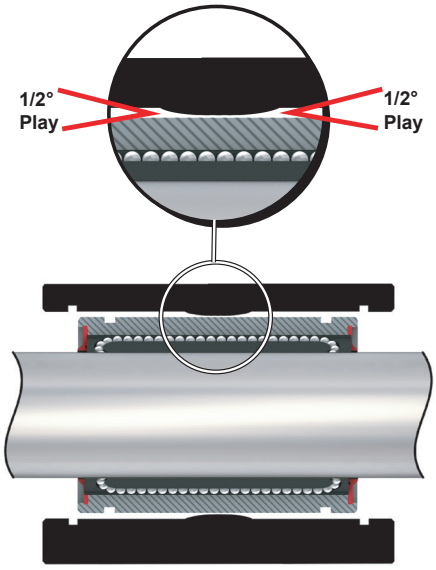
- PBC Linear Ball Bearing Pre-installed
- Pillow Block Housing Material: Aluminum alloy with clear anodize finish
- Centerline tolerance: ± 0.001"
- Internal self-aligning feature provides ± 1/2° bearing movement in all directions allowing for some shaft deflection and misalignment
- IPP(x)04G thru IPP(x)16G ID tolerance: 0/-0.0005"
- IPP(x)20G ID tolerance: 0/-0.0006"

Closed Bearing



Open Bearing

PBC Ball Bearing Pillow Block							
Part Number	*Price*	*Nominal ID*	*Installed Bearing*	*Form Factor*	*Static Load Rating (C_o)*	*Dynamic Load Rating (C)*	*Drawing Links*
IPP04G	$-5#H#:	1/4in	IP04G	closed type	59 lbs	48 lbs	PDF
IPP06G	$;-5#H!:	3/8in	IP06G		70 lbs	50 lbs	PDF
IPP08G	$-5#H?:	1/2in	IP08G		178 lbs	114 lbs	PDF
IPP10G	$;-5#H,:	5/8in	IP10G		265 lbs	174 lbs	PDF
IPP12G	$5#n0:	3/4in	IP12G		307 lbs	193 lbs	PDF
IPP16G	$5#n1:	1in	IP16G		352 lbs	220 lbs	PDF
IPP20G	$05#n2:	1-1/4in	IP20G		615 lbs	352 lbs	PDF
IPPN08G	$5#n3:	1/2in	IP08G-OP	open type	178 lbs	114 lbs	PDF
IPPN10G	$5#n4:	5/8in	IP10G-OP		265 lbs	174 lbs	PDF
IPPN12G	$5#n5:	3/4in	IP12G-OP		307 lbs	193 lbs	PDF
IPPN16G	$05#n6:	1in	IP16G-OP		352 lbs	220 lbs	PDF
IPPN20G	$05#n7:	1-1/4in	IP20G-OP		615 lbs	352 lbs	PDF



Internal Self-aligning Feature

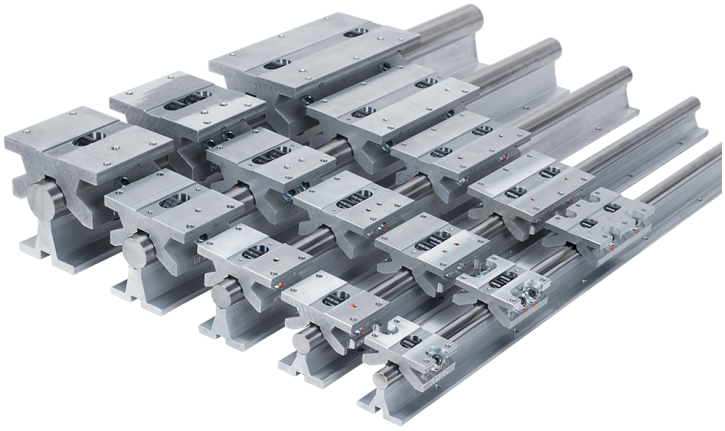
PBC Linear

Roller Pillow Blocks

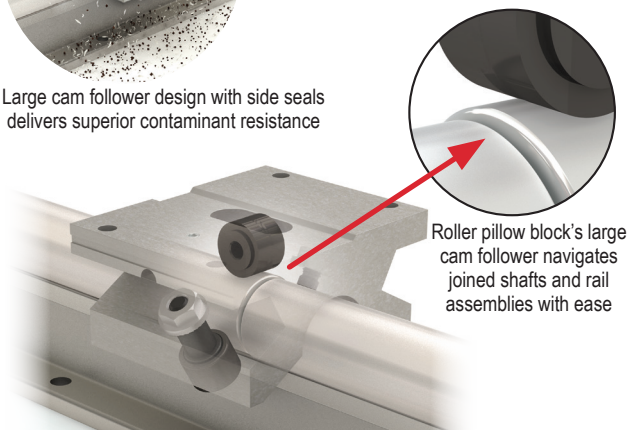
Features

The Roller Pillow Block system carries heavy loads and easily maneuvers over joined or misaligned shafts over long travels. The system is corrosion resistant and provides high speeds and rigidity in the toughest applications. Large cam followers, equipped with side seals, deliver industrial strength performance and excel in dirty environments.

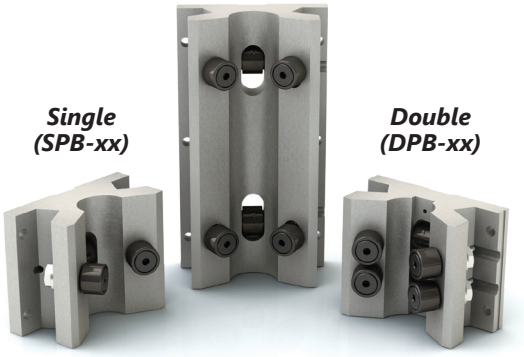
- Superior for joined rail applications
- Best suited for horizontal applications with normal downward loading
- Available in 3 Cam Follower Configurations
- Available for various shafts sizes from 1/2" thru 1 1/4"
- Dynamic Load Rating up to 2,800 lbf (12,455 N)
- Adjustable clearance
- Corrosion resistant
- Interchangeable with industry standard pillow blocks



Large cam follower design with side seals delivers superior contaminant resistance

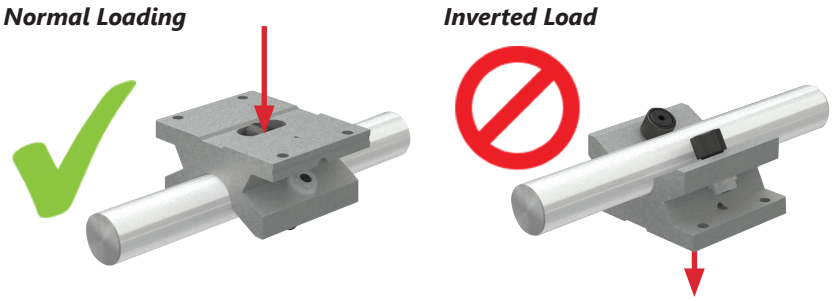


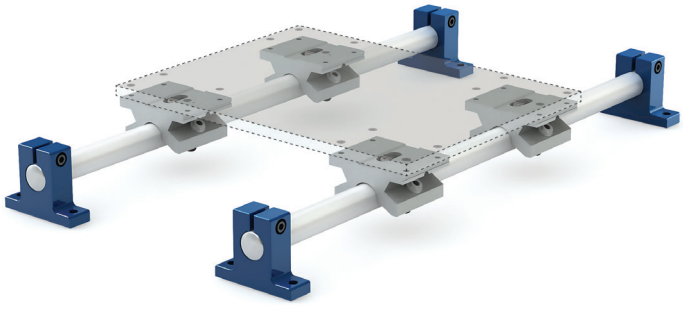
Roller pillow block's large cam follower navigates joined shafts and rail assemblies with ease

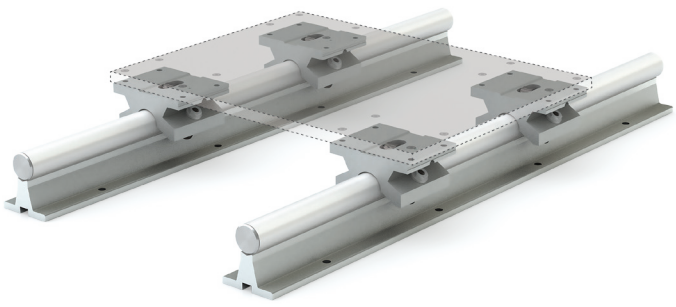


Loading and Design

Roller Pillow Blocks are best suited for Normal Downward Loading and used together as shown here with 2 rails and 4 roller pillow blocks. Individually they are not designed for large moment loads, so such loading will lead to premature failure





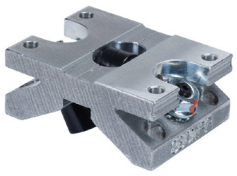


PBC Linear

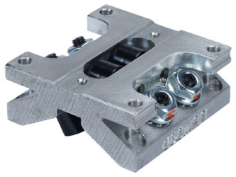
Roller Pillow Blocks

Features

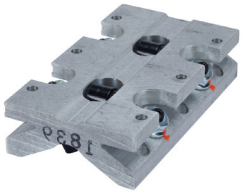
- Pillow Block Housing Material: Aluminum
- Bearing Type: Sealed Cam Follower
- Bearing Material: Carbon Steel
- Linear travel maximum speed: 7.6m/s (25ft/s)
- Single Roller Pillow Block (SPB-xx)
  - Self aligning +/-0.5°
  - Can be used on curved rails
- Double Roller Pillow Block (DPB-xx)
  - Twice the dynamic load rating of Single Pillow Block
- Twin Roller Pillow Block (TWN-xx)
  - Same load rating as Double Roller Pillow Block
  - Can be used when using only one block per shaft
- Compatible with linear precision ground shafts such as the PBC Simplicity 60 Plus series (sold by AutomationDirect)



SPB-08-OPN



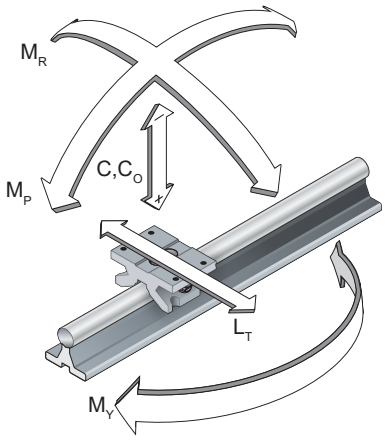
DPB-08-OPN



TWN-08-OPN

Roller Pillow Block Specifications

Part Number	Price	For Shaft Diameter	Carriage Length (C)	Dynamic (C) (N)	Drawing Links
Single Roller Pillow Block					
SPB-08-OPN	$;06f9z:	1/2in	1.5 in	1779	PDF
SPB-10-OPN	$;06f9?:	5/8in	1.75 in	2224	PDF
SPB-12-OPN	$;;06f9,:	3/4in	1.87 in	2669	PDF
SPB-16-OPN	$;06fa0:	1in	2.62 in	4248	PDF
SPB-20-OPN	$;06fa1:	1-1/4in	3.37 in	6228	PDF
Double Roller Pillow Block					
DPB-08-OPN	$;;06f9t:	1/2in	2 in	3559	PDF
DPB-10-OPN	$;06f9u:	5/8in	2.5 in	4448	PDF
DPB-12-OPN	$;06f9v:	3/4in	2.62 in	5338	PDF
DPB-16-OPN	$;06f9x:	1in	2.62 in	8496	PDF
DPB-20-OPN	$;06f9y:	1-1/4in	3.37 in	12455	PDF
Twin Roller Pillow Block					
TWN-08-OPN	$;;06f9]:	1/2in	3.5 in	3559	PDF
TWN-10-OPN	$;;06f9[:	5/8in	4 in	4448	PDF
TWN-12-OPN	$;06f9_:	3/4in	4.5 in	5338	PDF
TWN-16-OPN	$;06f9#:	1in	6 in	8496	PDF
TWN-20-OPN	$;;06f9!:	1-1/4in	7.5 in	12455	PDF



Note: Pillow blocks are designed for only downward, normal loads (C). Moment loads and Lateral Loads (Lt) are not recommended and not rated.

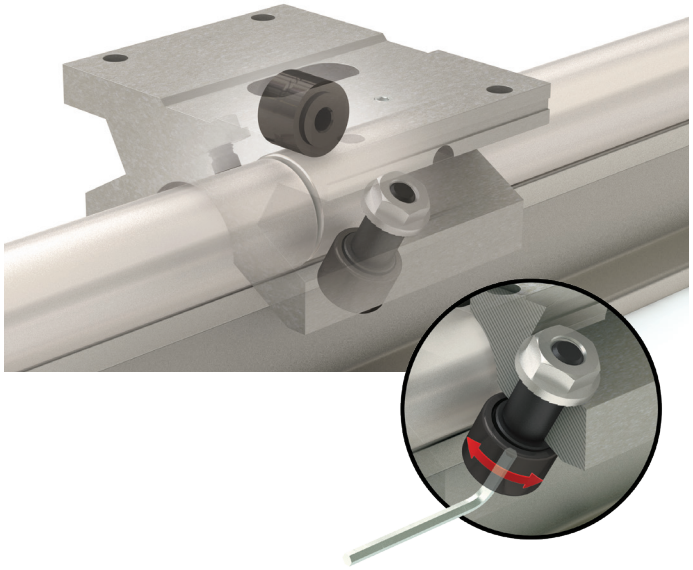
PBC Linear

Roller Pillow Blocks

Adjustments

Roller Pillow Blocks are factory set for use with Simplicity® 60 Plus® shafting (sold by AutomationDirect). Adjustments can be made to the eccentric cam follower to either increase or decrease the shaft clearance.

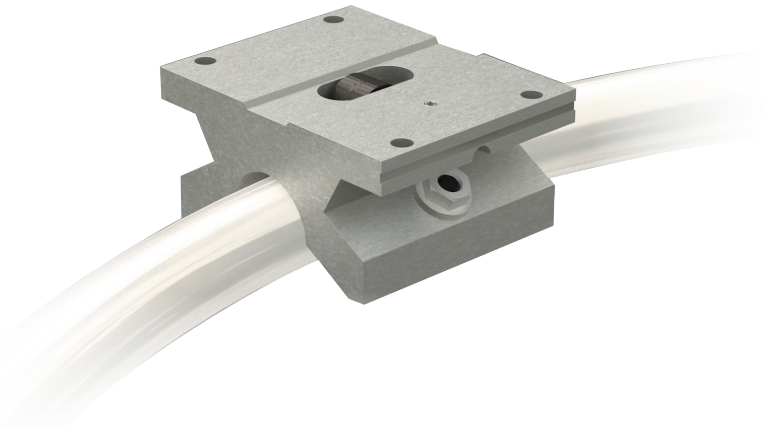
Located on the same side of the Roller Pillow Block as the set screw, the eccentric cam follower is adjusted by using a stubby allen wrench while allowing a 0.002" feeler gauge to freely move between the shaft and the eccentric roller. The fixed side must remain in contact with the shaft. If care is 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.



Turning a Curve

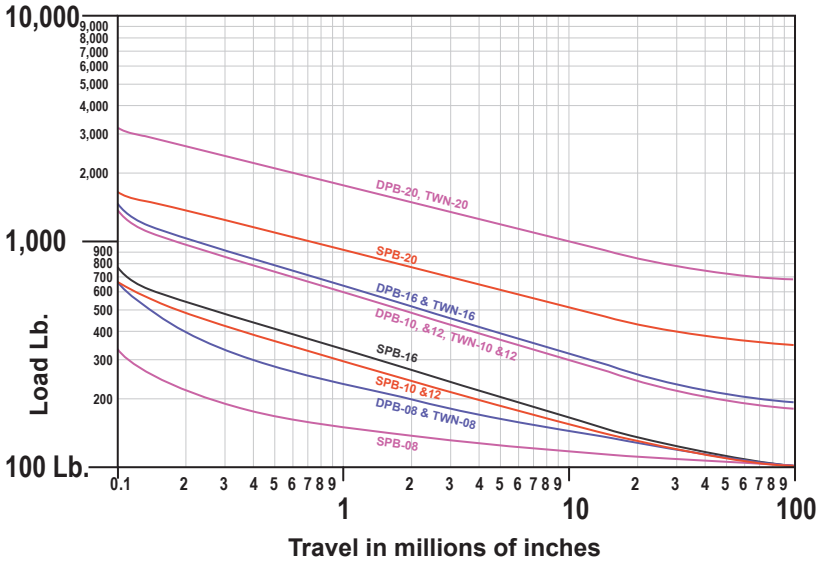
A single Roller Pillow Block has the ability to turn a curve or run on a non-linear system. The following table lists the minimum track radius that the single Roller Pillow Block can tolerate without additional alteration.

Pillow Block Size	*Minimum Track Radius*
8	6"
10	12"
12	14"
16	18"
20	36"



Lubrication, Rails & Bearings

The rollers are internally lubricated for life, but the rails must always have a layer of grease. As a guideline, reapply fresh grease every 50,000 cycles.

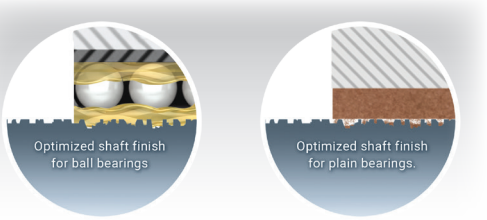


PBC Linear

PBC Linear Shafts and Shaft Supports

PBC Linear Simplicity® 60 Plus Linear Shaft Features

- Optimized surface finish for plain and ball bearings
- Straightness: 0.001"–0.002" per ft cumulative
- Length Tolerance: ±0.030"
- Surface Finish: 8-12Ra
- Hardness:
  - RC60-65 for 1060 Steel
  - RC50-55 for 440C Stainless Steel



In most applications, smoother is not better; in fact it means decreased performance and shortened life. PBC Linear has engineered the surface finish for optimum performance

PBC Linear Shafts (1060 Carbon Steel)

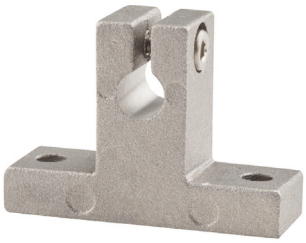
Part Number	Price	Nominal Diameter	Length	Material	Drawing Links
NIL04-006.000-SL	$--5#ji:	1/4in	6.0 in	1060 steel	PDF
NIL04-012.000-SL	$--5#jj:		12.0 in		PDF
NIL06-006.000-SL	$-5#jk:	3/8in	6.0 in		PDF
NIL06-012.000-SL	$--5#jl:		12.0 in		PDF
NIL06-018.000-SL	$-5#jn:		18.0 in		PDF
NIL08-012.000-SL	$-5#jo:	1/2in	12.0 in		PDF
NIL08-024.000-SL	$-5#jp:		24.0 in		PDF
NIL08-036.000-SL	$-5#jq:		36.0 in		PDF
NIL10-012.000-SL	$-5#js:	5/8in	12.0 in		PDF
NIL10-024.000-SL	$;-5#jt:		24.0 in		PDF
NIL10-036.000-SL	$-5#ju:		36.0 in		PDF
NIL12-012.000-SL	$-5#jv:	3/4in	12.0 in		PDF
NIL12-024.000-SL	$-5#jx:		24.0 in		PDF
NIL12-036.000-SL	$-5#jy:		36.0 in		PDF
NIL16-012.000-SL	$-5#jz:	1in	12.0 in		PDF
NIL16-024.000-SL	$;-5#j]:		24.0 in		PDF
NIL16-036.000-SL	$;-5#j[:		36.0 in		PDF
NIL20-012.000-SL	$-5#j_:	1-1/4in	12.0 in		PDF
NIL20-024.000-SL	$-5#j#:		24.0 in		PDF
NIL20-036.000-SL	$;-5#j!:		36.0 in		PDF

PBC Linear Shafts (440C Stainless Steel)

Part Number	Price	Nominal Diameter	Length	Material	Drawing Links
NIL06SS-006.000-SL	$-5#j?:	3/8in	6.0 in	440C stainless steel	PDF
NIL06SS-012.000-SL	$;-5#j,:		12.0 in		PDF
NIL08SS-012.000-SL	$5#k0:	1/2in			PDF
NIL08SS-024.000-SL	$5#k1:		24.0 in		PDF
NIL08SS-036.000-SL	$5#k2:		36.0 in		PDF
NIL10SS-012.000-SL	$5#k3:	5/8in	12.0 in		PDF
NIL10SS-024.000-SL	$5#k4:		24.0 in		PDF
NIL10SS-036.000-SL	$05#k5:		36.0 in		PDF
NIL12SS-012.000-SL	$5#k6:	3/4in	12.0 in		PDF
NIL12SS-024.000-SL	$5#k7:		24.0 in		PDF
NIL12SS-036.000-SL	$05#k8:		36.0 in		PDF
NIL16SS-012.000-SL	$5#k9:	1in	12.0 in		PDF
NIL16SS-024.000-SL	$05#ka:		24.0 in		PDF
NIL16SS-036.000-SL	$05#kb:		36.0 in		PDF
NIL20SS-012.000-SL	$5#kc:	1-1/4in	12.0 in		PDF
NIL20SS-024.000-SL	$05#kd:		24.0 in		PDF
NIL20SS-036.000-SL	$05#ke:		36.0 in		PDF

PBC Linear Shaft Support Features

- End support blocks can be used for end or intermediate shaft support
- Instant bolt-down installation
- Lightweight and strong.
- Can be used with all shaft types.
- Should be used where deflection between supports is not a problem.
- Material: Aluminum with anodize finish
- Center height tolerance: +/- 0.001"



PBC Shaft Support

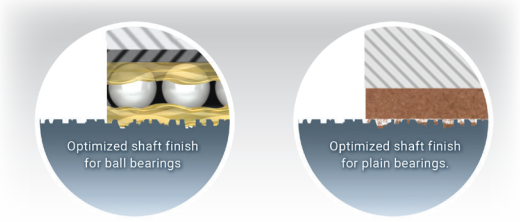
Part Number	Price	Nominal Diameter	Center Height	Drawing Links
NSB04	$-5#l7:	1/4 in	11/16 in	PDF
NSB06	$-5#l8:	3/8 in	3/4 in	PDF
NSB08	$-5#l9:	1/2 in	1 in	PDF
NSB10	$-5#la:	5/8 in	1 in	PDF
NSB12	$-5#lb:	3/4 in	1-1/4 in	PDF
NSB16	$-5#l5:	1 in	1-1/2 in	PDF
NSB20	$-5#l6:	1-1/4 in	1-3/4 in	PDF

PBC Linear

PBC Linear Supported Shafts

PBC Linear Simplicity® 60 Plus Supported Linear Shaft Features

- Optimized surface finish for plain and ball bearings
- Straightness: 0.001"–0.002" per ft cumulative
- Length Tolerance: ±0.030"
- Surface Finish: 8-12Ra
- Hardness:
  - RC60-65 for 1060 Steel
  - RC50-55 for 440C Stainless Steel
- Shaft support material: Aluminum
- Centerline tolerance: ±0.002"



In most applications, smoother is not better; in fact it means decreased performance and shortened life. PBC Linear has engineered the surface finish for optimum performance

PBC Supported Linear Shafts (1060 Carbon Steel)

Part Number	Price	Nominal Diameter	Length	Material	Drawing Links
SRA08-012.000-SL	$;05#kf:	1/2in	12.0 in	1060 steel	PDF
SRA08-024.000-SL	$05#kg:		24.0 in		PDF
SRA08-036.000-SL	$05#kh:		36.0 in		PDF
SRA10-012.000-SL	$-05#ki:	5/8in	12.0 in		PDF
SRA10-024.000-SL	$-05#kj:		24.0 in		PDF
SRA10-036.000-SL	$05#kk:		36.0 in		PDF
SRA12-012.000-SL	$-05#kl:	3/4in	12.0 in		PDF
SRA12-024.000-SL	$05#kn:		24.0 in		PDF
SRA12-036.000-SL	$05#ko:		36.0 in		PDF
SRA16-012.000-SL	$05#kp:	1in	12.0 in		PDF
SRA16-024.000-SL	$05#kq:		24.0 in		PDF
SRA16-036.000-SL	$05#ks:		36.0 in		PDF
SRA20-012.000-SL	$;05#kt:	1-1/4in	12.0 in		PDF
SRA20-024.000-SL	$05#ku:		24.0 in		PDF
SRA20-036.000-SL	$05#kv:		36.0 in		PDF

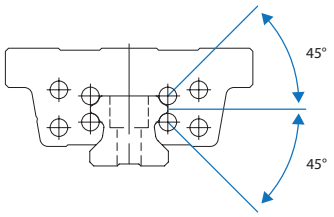
PBC Supported Linear Shafts (440C Stainless Steel)

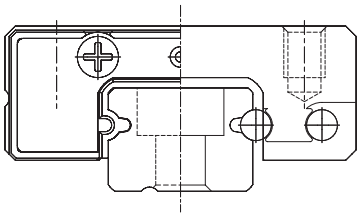
Part Number	Price	Nominal Diameter	Length	Material	Drawing Links
SRA08SS-012.000-SL	$05#kx:	1/2in	12.0 in	440C stainless steel	PDF
SRA08SS-024.000-SL	$05#ky:		24.0 in		PDF
SRA08SS-036.000-SL	$05#kz:		36.0 in		PDF
SRA10SS-012.000-SL	$;05#k]:	5/8in	12.0 in		PDF
SRA10SS-024.000-SL	$;05#k[:		24.0 in		PDF
SRA10SS-036.000-SL	$05#k_:		36.0 in		PDF
SRA12SS-012.000-SL	$05#k#:	3/4in	12.0 in		PDF
SRA12SS-024.000-SL	$;05#k!:		24.0 in		PDF
SRA12SS-036.000-SL	$05#k?:		36.0 in		PDF
SRA16SS-012.000-SL	$;05#k,:	1in	12.0 in		PDF
SRA16SS-024.000-SL	$-05#l0:		24.0 in		PDF
SRA16SS-036.000-SL	$-05#l1:		36.0 in		PDF
SRA20SS-012.000-SL	$-05#l2:	1-1/4in	12.0 in		PDF
SRA20SS-024.000-SL	$-05#l3:		24.0 in		PDF
SRA20SS-036.000-SL	$-05#l4:		36.0 in		PDF

WON Linear Bearings and Rails

Product Overview

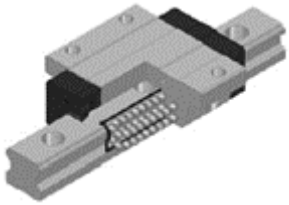
H-Series has 4 rows of ball bearings continuously circulating and making 45° contact with an arc-groove feature in the rail. This unique configuration provides 4-direction equal load sharing in any direction. This translates into lower friction resistance, smooth motion, and long life.





M & MB-Series have 2 rows of ball bearings continuously circulating and making 4 point 45° contact with an gothic-arc-groove feature in the Rail. This unique configuration provides 4-direction equal load sharing in any direction, in a very compact assembly. This translates into lower friction resistance, smooth motion, and long life.

End Seals are included with all products offered to protect against dust and foreign materials which induce premature wear and shorter life. Optional Inside Seals are offered, on the H-Series for additional protection.



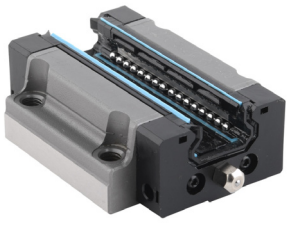
WON Linear Bearings and Rails

H-Series Bearings and Rail Features

- Bearing Preload: Moderate
- Precision Classification: Moderate (no symbol)
- Radial Clearance Classification: Common Clearance
- Material: Carbon Steel
- Rail Hardness: HRC58-64
- End Seals included with all bearings
- Grease fitting included

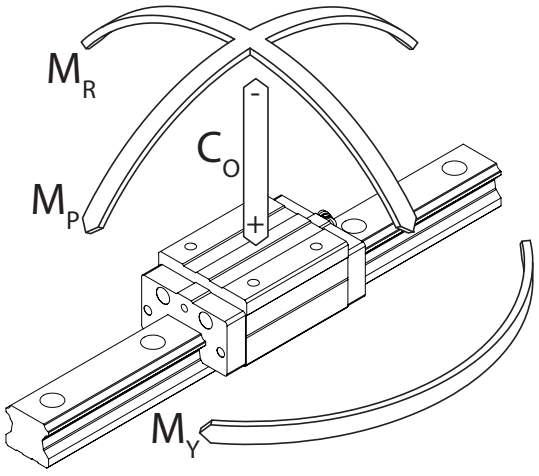
H-Series Linear Bearing Ratings

Part Number	Price	Bearing Form Factor	Inside Seal	Series Size	Load Ratings							Drawing Links
					Static (Co)	Dynamic (C)	Pitch Moment (M_P)		Yaw Moment (M_Y)		Roll Moment (M_R)	
							1 Linear Bearing	2 Linear Bearing	1 Linear Bearing	2 Linear Bearing		
H15FSSG0	$;4!qk:	flanged	yes	H15	16200 N	9900 N	115 N·m	552 N·m	115 N·m	552 N·m	129 N·m	PDF
H15FUUG0	$;-4!qj:		no									PDF
H15RSSG0	$;-4!qi:	rectangular	yes									PDF
H15RUUG0	$;4!qh:		no									PDF
H20FSSG0	$;4!qp:	flanged	yes	H20	23900 N	14900 N	221 N·m	1049 N·m	221 N·m	1049 N·m	251 N·m	PDF
H20FUUG0	$;4!qo:		no									PDF
H20RSSG0	$;4!qn:	rectangular	yes									PDF
H20RUUG0	$;-4!ql:		no									PDF
H25FSSG0	$;4!qu:	flanged	yes	H25	33100 N	22100 N	337 N·m	1636 N·m	337 N·m	1636 N·m	398 N·m	PDF
H25FUUG0	$;;4!qt:		no									PDF
H25RSSG0	$;4!qs:	rectangular	yes									PDF
H25RUUG0	$;4!qq:		no									PDF
H30FSSG0	$;04!qz:	flanged	yes	H30	57100 N	38400 N	711 N·m	3384 N·m	711 N·m	3384 N·m	828 N·m	PDF
H30FUUG0	$;04!qy:		no									PDF
H30RSSG0	$;04!qx:	rectangular	yes									PDF
H30RUUG0	$;04!qv:		no									PDF
H35FSSG0	$;04!q#:	flanged	yes	H35	74600 N	51100 N	1062 N·m	5012 N·m	1062 N·m	5012 N·m	1298 N·m	PDF
H35FUUG0	$;04!q_:		no									PDF
H35RSSG0	$;;04!q[:	rectangular	yes									PDF
H35RUUG0	$;;04!q]:		no									PDF



With Inside Seal

Without Inside Seal



WON Linear Bearings and Rails

H-Series Linear Rails

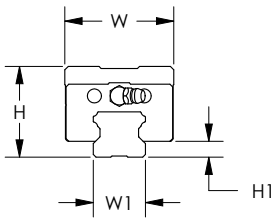
Part Number	Price	Series Size	Length	Parallelism	Mass/Length	Drawing Links
H15-400L	$;4!s9:	H15	400 mm	8 µm	1300 g/m	PDF
H15-580L	$;04!sa:		580 mm	11 µm		PDF
H15-760L	$;04!sb:		760 mm	12 µm		PDF
H15-1000L	$;04!sc:		1000 mm	13 µm		PDF
H20-400L	$;4!sd:	H20	400 mm	8 µm	2200 g/m	PDF
H20-580L	$;04!se:		580 mm	11 µm		PDF
H20-760L	$;;04!sf:		760 mm	12 µm		PDF
H20-1000L	$;04!sg:		1000 mm	13 µm		PDF
H25-400L	$;4!sh:	H25	400 mm	8 µm	3000 g/m	PDF
H25-580L	$;-04!si:		580 mm	11 µm		PDF
H25-760L	$;-04!sj:		760 mm	12 µm		PDF
H25-1000L	$;04!sk:		1000 mm	13 µm		PDF
H30-360L	$;-4!sl:	H30	360 mm	8 µm	4850 g/m	PDF
H30-520L	$;04!sn:		520 mm	11 µm		PDF
H30-760L	$;04!so:		760 mm	12 µm		PDF
H30-1000L	$;04!sp:		1000 mm	13 µm		PDF
H35-360L	$;04!sq:	H35	360 mm	8 µm	6580 g/m	PDF
H35-520L	$;04!ss:		520 mm	11 µm		PDF
H35-760L	$;;04!st:		760 mm	12 µm		PDF
H35-1000L	$;04!su:		1000 mm	13 µm		PDF

Rails cannot be butted together end-to-end to create longer runs. The lengths offered here have a chamfer feature on both ends.

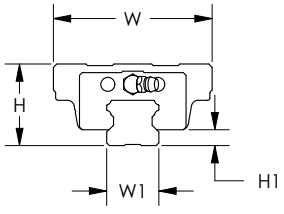
H-Series Dimensions

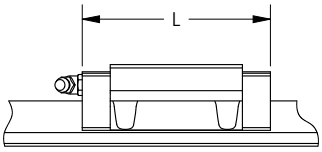
Bearing with Rail	Bearing Form Factor	Height, H (mm)	Width, W (mm)	Length, L (mm)	Clearance, H1 (mm)	Rail Width, W1 (mm)
H15Rxxxx	rectangular	28	34	57	4.7	15
H15Fxxxx	flanged	24	47			
H20Rxxxx	rectangular	30	44	72.7	6	20
H20Fxxxx	flanged	30	63			
H25Rxxxx	rectangular	40	48	83	7	23
H25Fxxxx	flanged	36	70			
H30Rxxxx	rectangular	45	60	97.8	7.5	28
H30Fxxxx	flanged	42	90			
H35Rxxxx	rectangular	55	70	110	9	34
H35Fxxxx	flanged	48	100			

Rectangular



Flanged





WON Linear Bearings and Rails

M-Series Bearings and Rail Features

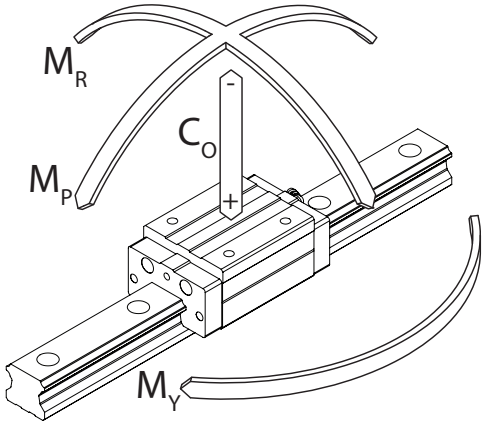
- Low Profile
- Bearing Preload: Moderate
- Precision Classification: Moderate (no symbol)
- Radial Clearance Classification: Common Clearance
- Bearing Block Housing Material: Stainless Steel
- Rail Material: Stainless Steel
- Bearing Material: SUJ2 Bearing Steel
- Rail Hardness: HRC58-64
- End Seals included with all bearings

M-Series Linear Bearing Ratings

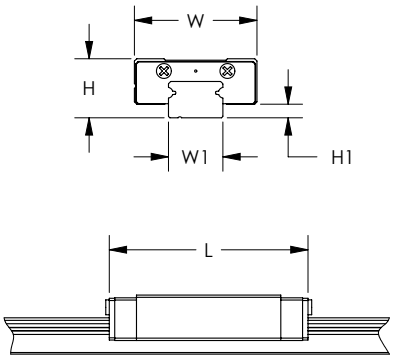
Part Number	Price	Bearing Form Factor	Series Size	Load Ratings							Drawing Links
				Static (Co)	Dynamic (C)	Pitch Moment (MP)		Yaw Moment (My)		Roll Moment (MR)	
						1 Linear Bearing	2 Linear Bearing	1 Linear Bearing	2 Linear Bearing		
M7LUUG0	$;4!q?:	rectangular long	M7	2650 N	1631 N	10.1 N·m	50 N·m	10.1 N·m	50 N·m	9.67 N·m	PDF
M7NUUG0	$;;4!q!:	rectangular		1703 N	1197 N	4.2 N·m	23.1 N·m	4.2 N·m	23.1 N·m	6.22 N·m	PDF
M9LUUG0	$;4!s0:	rectangular long	M9	4030 N	2375 N	21.9 N·m	102.8 N·m	21.9 N·m	102.8 N·m	18.74 N·m	PDF
M9NUUG0	$;;4!q,:	rectangular		2545 N	1721 N	9.3 N·m	46.6 N·m	9.3 N·m	46.6 N·m	11.84 N·m	PDF
M12LUUG0	$;4!s2:	rectangular long	M12	6200 N	4246 N	34.8 N·m	169.1 N·m	34.8 N·m	169.1 N·m	38.44 N·m	PDF
M12NUUG0	$;4!s1:	rectangular		3816 N	3023 N	14.4 N·m	75.8 N·m	14.4 N·m	75.8 N·m	23.66 N·m	PDF

M-Series Linear Rails

Part Number	Price	Series Size	Length	Parallelism	Mass/ Length	Drawing Links
M7-85L	$;4!sv:	M7	85 mm	11 µm	253 g/m	PDF
M7-190L	$;4!sx:		190 mm	14 µm		PDF
M7-370L	$;4!sy:		370 mm	18 µm		PDF
M7-610L	$;04!sz:		610 mm	22 µm		PDF
M9-95L	$;;4!s]:	M9	95 mm	11 µm	391 g/m	PDF
M9-175L	$;;4!s[:		175 mm	14 µm		PDF
M9-495L	$;4!s_:		495 mm	21 µm		PDF
M9-695L	$;04!s#:		695 mm	23 µm		PDF
M12-195L	$;;4!s!:	M12	195 mm	15 µm	679 g/m	PDF
M12-320L	$;4!s?:		320 mm	18 µm		PDF
M12-470L	$;;4!s,:		470 mm	21 µm		PDF
M12-695L	$;;04!t0:		695 mm	23 µm		PDF



Rails cannot be butted together end-to-end to create longer runs. The lengths offered here have a chamfer feature on both ends.



M-Series Dimensions

Bearing with Rail	Height, H (mm)	Width, W (mm)	Length, L (mm)	Clearance, H1 (mm)	Rail Width, W1 (mm)
M7LUUG0	8	17	31.8	1.5	7
M7NUUG0			24.3		
M9LUUG0	10	20	41.4	2	9
M9NUUG0			31.3		
M12LUUG0	13	27	45.4	3	12
M12LUUG0			34.9		

WON Linear Bearings and Rails

MB-Series Bearings and Rail Features

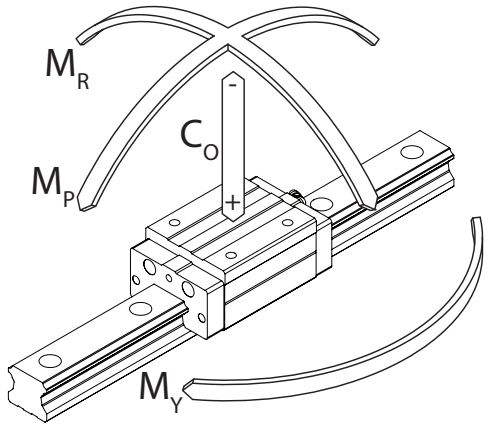
- Wide, Low Profile
- Bearing Preload: Moderate
- Precision Classification: Moderate (no symbol)
- Radial Clearance Classification: Common Clearance
- Bearing Block Housing Material: Stainless Steel
- Rail Material: Stainless Steel
- Bearing Material: SUJ2 Bearing Steel
- Rail Hardness: HRC58-64
- End Seals included with all bearings

MB-Series Linear Bearing Ratings

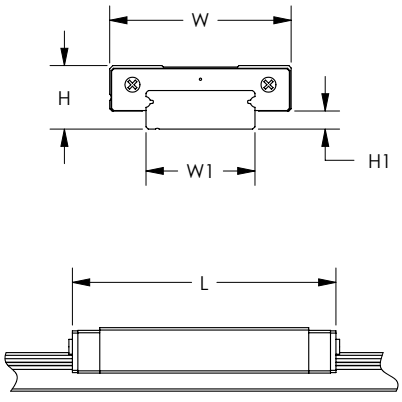
Part Number	Price	Bearing Form Factor	Series Size	Load Ratings							Drawing Links
				Static (Co)	Dynamic (C)	Pitch Moment (MP)		Yaw Moment (My)		Roll Moment (MR)	
						1 Linear Bearing	2 Linear Bearing	1 Linear Bearing	2 Linear Bearing		
MB7LUUG0	$;4!s4:	rectangular long	MB7	3975 N	2166 N	22.5 N·m	106.1 N·m	22.5 N·m	106.1 N·m	28.42 N·m	PDF
MB7NUUG0	$;4!s3:	rectangular		2650 N	1631 N	10.1 N·m	51.1 N·m	10.1 N·m	51.1 N·m	18.95 N·m	PDF
MB9LUUG0	$;50b,:	rectangular long	MB9	5303 N	2878 N	37.8 N·m	172.9 N·m	37.8 N·m	172.9 N·m	48.52 N·m	PDF
MB9NUUG0	$;4!s5:	rectangular		3606 N	2197 N	18.2 N·m	87.6 N·m	18.2 N·m	87.6 N·m	33 N·m	PDF
MB12LUUG0	$;4!s8:	rectangular long	MB12	9062 N	5539 N	73.8 N·m	338.7 N·m	73.8 N·m	338.7 N·m	110.56 N·m	PDF
MB12NUUG0	$;4!s7:	rectangular		5723 N	4015 N	31.2 N·m	152.2 N·m	31.2 N·m	152.2 N·m	69.83 N·m	PDF

MB-Series Linear Rails

Part Number	Price	Series Size	Length	Parallelism	Mass/ Length	Drawing Links
MB7-80L	$;;4!t1:	MB7	80 mm	11 µm	560 g/m	PDF
MB7-200L	$;;4!t2:		200 mm	15 µm		PDF
MB7-410L	$;;04!t3:		410 mm	20 µm		PDF
MB7-690L	$;;04!t4:		690 mm	23 µm		PDF
MB9-80L	$;;4!t5:	MB9	80 mm	11 µm	912 g/m	PDF
MB9-200L	$;;4!t6:		200 mm	15 µm		PDF
MB9-410L	$;;04!t7:		410 mm	20 µm		PDF
MB9-690L	$;;04!t8:		690 mm	23 µm		PDF
MB12-110L	$;;4!t9:	MB12	110 mm	12 µm	1369 g/m	PDF
MB12-270L	$;;04!ta:		270 mm	17 µm		PDF
MB12-430L	$;;04!tb:		430 mm	20 µm		PDF
MB12-750L	$;;04!tc:		750 mm	23 µm		PDF



Rails cannot be butted together end-to-end to create longer runs. The lengths offered here have a chamfer feature on both ends.



MB-Series Dimensions

Bearing with Rail	Height, H (mm)	Width, W (mm)	Length, L (mm)	Clearance, H1 (mm)	Rail Width, W1 (mm)
MB7LUUG0	9	25	43.5	2	14
MB7NUUG0			33		
MB9LUUG0	12	30	52	3	18
MB9NUUG0			40.2		
MB12LUUG0	14	40	59.7	4	24
MB12NUUG0			44.5		

For the latest prices, please check AutomationDirect.com.

GAM Rack and Pinion

GAM helical rack and pinion components are part of a complete linear motion solution.

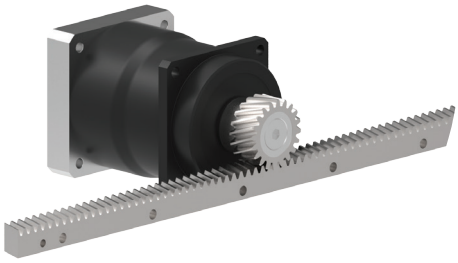
GAM®

- High precision helical rack for smooth, quiet operation available in module sizes of 1.5, 2 and 3 that mate with GAM pinions
- Pinions can be mounted to SureGear® gearboxes, are hardened to work with ISO 10 hardened rack
- Pinions available in module sizes of 1.5, 2 and 3 from 18 to 40 teeth
- Most cost-effective solution for linear motion greater than 2 meters
- Rack installation gauges available for use when installing multiple racks

Rack and Pinions

The GAM Helical Rack and Pinion series, along with our broad gearbox offering, provide a complete linear solution. Simply select the rack and pinion needed then match it with the right gearbox for your application.

- High-precision helical rack for smooth, quiet operation
- Pinions can be mounted to SureGear® gearboxes
- Pinions are hardened and work with ISO 10 hardened rack



What is Rack & Pinion?

A linear actuator that converts the rotary motion of the (circular) pinion to linear motion at the (linear) rack.

Why use a Rack & Pinion System?

A rack and pinion system is the most cost-effective installation for linear movements greater than 2 meters.

Why use a GAM Rack & Pinion System?

GAM matches their high-quality rack and pinion with the best precision gearboxes for your application.

GAM Pinions

Part Number	Price	Module	Teeth	Mounting	Pitch Diameter	Travel per Rotation	Max Feed Force	Mounting Distance	Fits	Drawing Links
84010001	$04z4?:	1.5	20	set screw	31.831mm	100mm	1.3 kN	31.4mm	SureGear PGCN23 series gearboxes	PDF
84010002	$;04z4,:	2	18	keyed shaft	38.197mm	120mm	2.8 kN	41.1mm	SureGear PGCN34 series gearboxes	PDF
84010003	$04z50:	2	18	keyed shaft	38.2mm	120mm	12.88 kN	41.1mm	SureGear PGA070 and PGB070 series gearboxes	PDF
84010004	$04z51:	2	20	keyed shaft	42.44mm	133.33mm	13.37 kN	43.22mm	SureGear PGA090 and PGB090 series gearboxes	PDF
84010005	$04z52:	2	30	keyed shaft	63.66mm	200mm	15.02 kN	53.83mm	SureGear PGA120 and PGB120 series gearboxes	PDF
84010006	$;04z4[:	3	22	keyed shaft	70.03mm	220mm	20.05 kN	61.01mm	SureGear PGA155 and PGB155 series gearboxes	PDF
84010007	$04z4_:	2	26	bolt-through	55.174mm	173.334mm	13.4 kN	50.4mm	SureGear PGD064 series gearboxes	PDF
84010008	$04z4#:	2	33	bolt-through	70.028mm	220mm	18.4 kN	57.8mm	SureGear PGD090 series gearboxes	PDF
84010009	$;04z4!:	2	40	bolt-through	84.883mm	266.667mm	14.8 kN	65.2mm	SureGear PGD110 series gearboxes	PDF

NOTE: Shaft Key is not included with Pinions

Set Screw Pinion
84010001

Keyed Pinion
84010002

Bolt Through Pinion
84010007

GAM Pinion General Specifications

Quality	ISO Q06
Material	4140 carbon steel
Helix Angle	Left Hand 19° 31'42"
Pressure Angle	20 degrees
Induction Hardened	55 - 60 HRC

One inspection pin included for use with rack height adjustments

Rack and Pinion

GAM Racks			
Part Number	***Price***	***Description***	***Drawing Links***
74020012	$;04t6e:	GAM helical rack, Module 1.5, 200 tooth, 1m length. For use with Module 1.5 pinions.	PDF
74020004	$;-04t6j:	GAM helical rack, Module 2, 150 tooth, 1m length. For use with Module 2.0 pinions.	PDF
74020005	$;04t6k:	GAM helical rack, Module 3, 100 tooth, 1m length. For use with Module 3.0 pinions.	PDF

Rack
74020012

GAM Rack General Specifications			
Module	***1.5***	***2.0***	***3.0***
Quality	ISO Q10		
Material	1045 carbon steel		
Helix Angle	Right Hand 19° 31'42"		
Pressure Angle	20 degrees		
Induction Hardened	50 - 55 HRC		
Tooth Thickness Tolerance (µm)	-124	-124	-124
Single Pitch Error (µm)	≤37	≤37	≤39
Total Pitch Error (µm)	≤148	≤148	≤162

Rack Installation

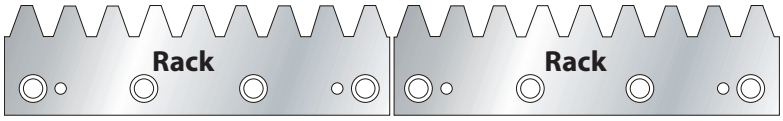
These are the three main steps to installing a GAM rack. Installation of multiple rack pieces end-to-end requires an opposite tooth installation gauge:

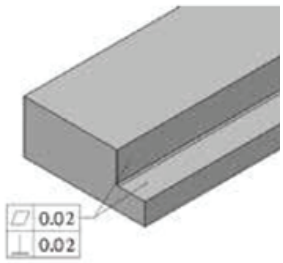
GAM Gauges			
Part Number	***Price***	***Description***	***Drawing Links***
74030010	$;-4t6l:	GAM helical rack installation gauge, for use with Module 1.5 racks.	PDF
74030001	$;4t6n:	GAM helical rack installation gauge, for use with Module 2.0 racks.	PDF
74030002	$;4t6o:	GAM helical rack installation gauge, for use with Module 3.0 racks.	PDF

Step 1

Put the racks on the base, end to end, loosely installing the screws

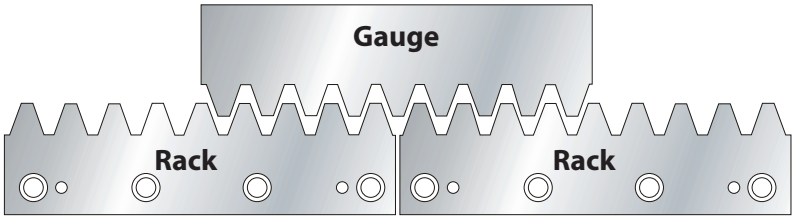
NOTE: Ensure the mounting surface of installation is clean and clear of debris and within tolerance (Perpendicularity and Flatness≤0.02mm)





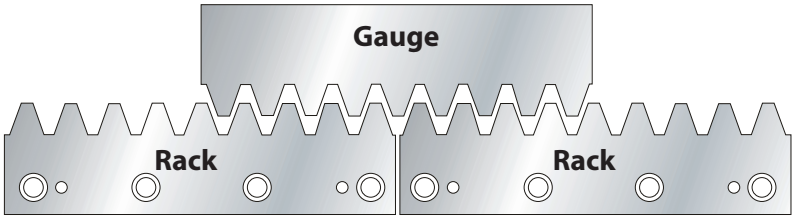
Step 2

Put the Rack Gauge across the ends of the joined racks and adjust the pitch. The ends of the racks each form half a tooth



Step 3

Bolt the racks to the base in sequence. Install dowel pins

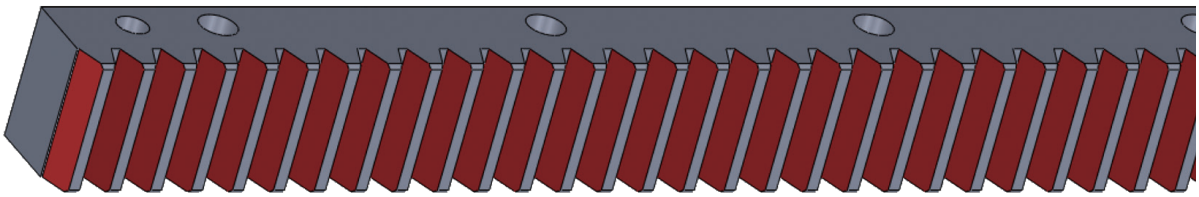


Rack and Pinion Alignment

For best performance, the rack and pinion must be installed with proper tooth engagement. To perform this check, apply the Gear Marking Compound to the Pinion and drive the pinion along the rack UNDER LOAD CONDITIONS.

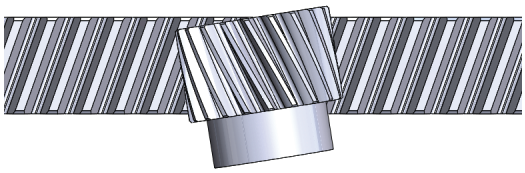
Correct

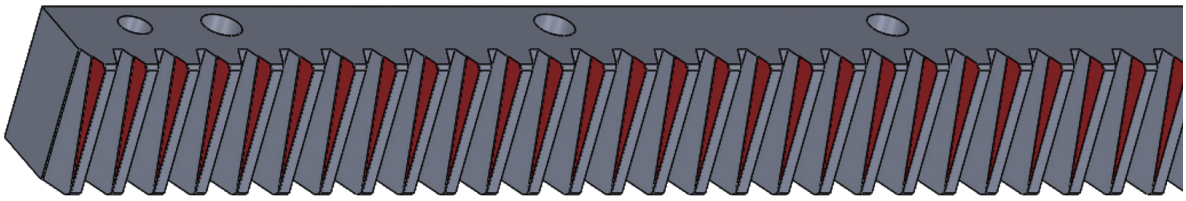
The Gear Marking Compound is consistently deposited across most the face of the tooth



Pinion is Not Parallel to Rack

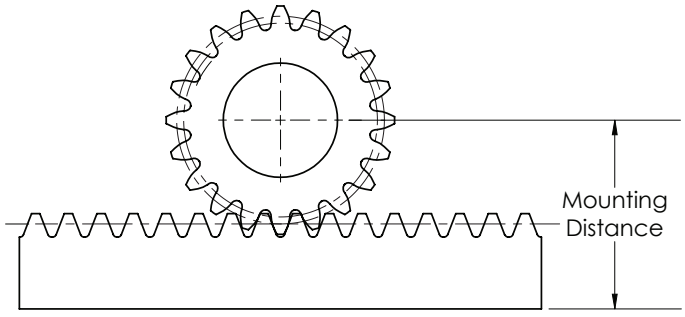
If the Gear Marking Compound forms a triangular shape across the face of the tooth, then the pinion and rack are not parallel. Adjust the pinion so the face of the pinion and the side of the rack are parallel. the axis of the pinion should be perpendicular to the rack.

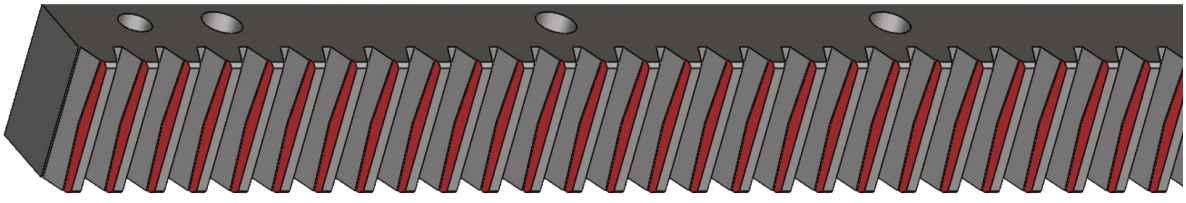




Incorrect Mounting Distance

If the Gear Marking Compound appears only on the top half across the face of the tooth, then there is insufficient tooth contact between the rack and pinion. Adjust the center distance between the rack and the pinion. The pinion specification tables include the center distance for each size pinion.





Rack and Pinion Terminology

Module

The module is the relative size of the rack and pinion as described by the pinion. It is the ratio of the diameter of a gear to the number of teeth on the gear. The module and number of teeth give the reference pitch diameter:

$$\text{Module (M)} = \frac{\text{Pitch Diameter}}{\text{Number of Teeth (z)}}$$

Reference Pitch Diameter = Module (M) x Number of Teeth (z)

NOTE: The rack and pinion must have the same module.

ISO Quality Number

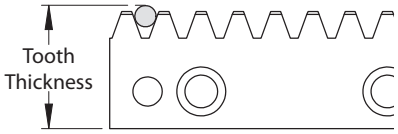
The ISO Quality Number describes the accuracy of the gear including the tooth alignment and profile, spacing variation, and radial runout among other things. AutomationDirect.com stocks Q6 and Q10 racks along with Q6 pinions.

ISO	DIN	AGMA	JIS
6	6	12	2
10	10	8	6

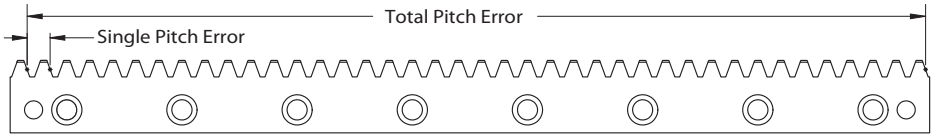
Tooth Thickness Tolerance

Tooth Thickness Tolerance is the relationship between tooth thickness and a measuring pin measurement.

- The tooth thickness of racks is usually measured via the pin measurement as tooth thickness can not be measured directly.
- A measuring pin is put into the teeth and measured to the back of the rack.



Pitch Error



Pitch: Distance between teeth as measured from a point on one rack tooth to the corresponding point on the next gear tooth.

Single Pitch Error: Error in the pitch between two teeth relative to the ideal.

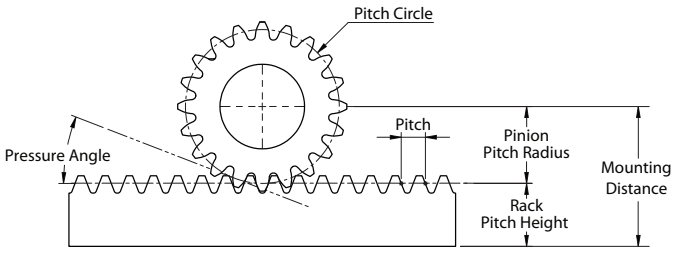
Total Pitch Error: Cumulative pitch error over the length of the rack

Circular Pitch: The distance from a point on one gear tooth to the corresponding point on the next gear tooth, measured along the pitch circle.

Pitch Circle: A circle transcribing the contact point on the teeth where the rack and pinion mesh correctly

Pitch Diameter: The diameter of the pinion's pitch circle.

Pressure Angle: The angle made by the sides of the tooth as it angles towards the top of the tooth. Mating gears and racks must have the same pressure angle.

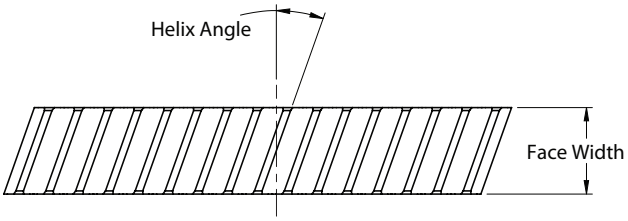


Mounting Distance: Distance between the center of the pinion and the bottom of the rack that ensures proper mesh. The Mounting distance should stay consistent for the length of the rack.

Mounting Distance = Pitch Height of Rack + Pitch Radius of Pinion

Rack and Pinion Terminology (Cont'd)

Helix Angle: Angle of the rack or gear tooth. GAM racks and pinions use a common helix angle of 19°31'42"



Gear Strength and Durability

Gear strength and durability depends on transmitted forces and power.

$$\text{Power } (P_{kW}) = \text{Force } (F_N) \times \text{Linear Velocity } (V_{mm/s})$$

$$\text{Force } (F_N) = \frac{1000 \times \text{Torque } (T_{Nm})}{\text{Pitch Radius } (r_{mm})}$$

$$\text{Linear Velocity } (V_{mm/s}) = \frac{\pi r_{mm} \times N_{RPM}}{60}$$

$$\text{Power } (P_{kW}) = \frac{T_{Nm} \times N_{RPM}}{9550}$$

The feed force required by the application should be less than the feed force capacity of the pinion or gearbox-pinion system as listed in this catalog. The feed force rating should be derated by the Overload Factor (K_a) and the Life Factor (K_L)

$$\text{Application Feed Force (F)} < \frac{K_L}{K_a} \times \text{Rated Feed Force (F)}$$

Overload Factor (K_a)

Impact from Prime Mover	*Impact from Load Side*		
	Uniform Load	*Medium Impact*	*Heavy Impact*
Uniform Load	1	1.25	1.75
Light Impact	1.25	1.5	2
Medium Impact	1.5	1.75	2.25

Life Factor (K_L)

Number of Cycles	*Hardness (HRC) ≥45*
Under 10,000	1.5
~10^5	1.5
~10^6	1.1
~10^7	1.0