



AuGlide[®] SY and SP
**BIMETAL BEARING SOLUTIONS FOR
LUBRICATED APPLICATIONS**



Who we are

GGB helps create a world of motion with minimal frictional loss through plain bearing and surface engineering technologies. With global R&D, testing, and production facilities, GGB partners with customers worldwide on customized tribological design solutions that are efficient and environmentally sustainable. GGB's engineers bring their expertise and passion for tribology to a wide range of industries, including automotive, aerospace and industrial manufacturing. To learn more about tribology for surface engineering from GGB, visit ggbearings.com.

Our products are used in tens of thousands of critical applications every day on our planet. It is always our goal to provide superior, high-quality solutions for our customers' needs, no matter where those demands take our products. From space vehicles to golf carts and virtually everything in between, we offer the industry's most extensive range of high-performance, maintenance-free bearing solutions for a multitude of applications:



Aerospace



Agriculture



Automotive



Construction



E-Mobility



Energy



Exoskeletons



Fluid Power



Industrial



Medical



Mining



Oil & Gas



Primary Metals



Railway



Recreation



Robotics & Automation

The GGB Advantage



MAINTENANCE-FREE

GGB bearings are self-lubricating, making them ideal for applications requiring long bearing life without continuous lubrication.



LOW FRICTION, HIGH WEAR RESISTANCE

Low coefficients of friction eliminate the need for lubrication, while providing smooth operation, reducing wear and extending service life.



NVH (NOISE, VIBRATION, HARSHNESS)

Plain bearings provide a smooth sliding motion between surfaces and their material properties and simple design reduce noise, vibration and harshness.



LOWER SYSTEM COST

A one-piece design offers space and weight reductions and thanks to the material compositions and self-lubricating properties, less maintenance is needed.



REDUCED CO₂ FOOTPRINT

GGB's flexible and local production platforms assure timely deliveries and reduced CO₂ footprint.



PARTNER SUPPORT

GGB offers tribological, application and design support, and partners with our customers to provide the most efficient solutions.



The Highest Standards in Fabrication

Our world-class manufacturing plants are certified in quality and excellence according to ISO 9001, IATF 16949, ISO 14001 and ISO 45001. This allows us to access the industry's best practices while aligning our management system with global standards.

For a complete listing of our certifications, please visit our website:

ggbearings.com/en/certificates

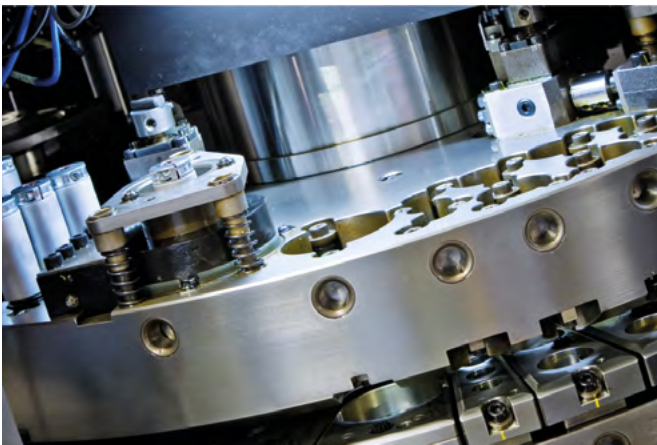


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1 Introduction

Increasingly demanding specifications of today's high-performance equipment and systems require that the bearings operate not only under severe working conditions with minimal or no maintenance but that they also offer increased reliability and durability with lower operating costs. With more than 100 years of experience and expertise in tribology, GGB offers, along with the widest range of lubricated and self-lubricating bearing products, extensive technical and application engineering knowledge.

In this respect, our Application Engineers can assist you in:

- Selection of the right type of plain bearing for your application
- Design of the bearing according to standard dimensions or to customer specific requirements
- Calculation of a lifetime estimate
- Assembly and installation recommendations

Thanks to our global production and supply network, we are able to offer customers throughout the world the industry's most extensive range of self-lubricating and prelubricated plain bearings for literally thousands of applications in scores of industries.

As a reliable supplier with flexible manufacturing, we can respond quickly to customer needs with either standard or customized products.

Our advanced R&D and testing facilities help us deliver comprehensive solutions and assure their performance, reliability and cost-effectiveness. Our high-performance bearing specialists have the experience and expertise to provide innovative solutions to even the most challenging applications.

2 Applications

AuGlide®, SY and SP bearings are perfectly suited to a wide range of applications

AuGlide®, SY

The bimetallic structure of AuGlide®, and SY bearings offers a bearing with very high mechanical strength, fatigue and wear resistance. AuGlide® and SY bearings are particularly recommended for lubricated applications working under extreme loads including shock loads and low speed oscillating movements.

Typical applications include:

Agricultural machinery, earth-movers, textile machinery, pneumatic equipment, king pin bushes, brake caliper bushes, mechanical handling and lifting equipment, hydraulic cylinders, off-highway equipment etc.

SP

The specific overlay composition of SP bearings makes them suitable for high-speed lubricated applications for which good emergency running is required.

Typical applications include:

Oil pump bearings, gearbox bushes, steering gear, power steering, pedal bushes, king pin bushes, tailgate pivots, brake caliper bushes, machine slides, hydraulic cylinders, hydraulic motors, pneumatic equipment, medical equipment, textile machinery, etc.



3 Material Structure



AuGlide® is a copper bismuth on steel lead-free bearings with high load capacity and excellent wear resistance. It is an innovative bimetal bearing for harsh operating conditions.

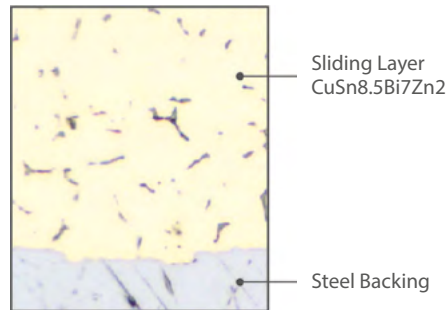


Fig. 1: AuGlide microsection

SY and SP

SY and SP are bimetal plain bearing materials each consisting of a steel backing to which is sintered a lead bronze sliding layer.

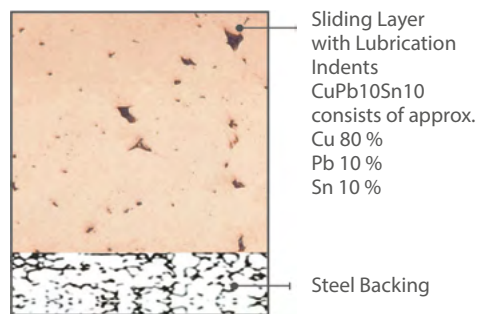


Fig. 2: SY microsection

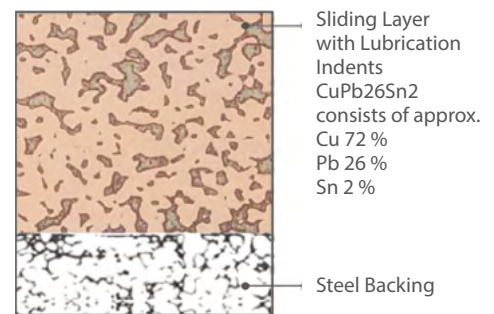


Fig. 3: SP microsection

4 Available Forms

SY is available as a standard range of cylindrical wrapped bushes and thrust washers in metric sizes.

Non-standard parts, plates and special forms are available on request.

AuGlide® and SP can be ordered as metric and inch bushes, plates and special forms.



5 Characteristics

AuGlide® and SY

- Capable of supporting high specific loads
- Excellent fatigue strength under dynamic and shock load conditions
- Suitable for oil and grease lubrication
- Superior performance under oscillating movement
- Steel backing provides strength and rigidity
- Thin wall construction permits compact bearing assembly
- Indents in the bearing surface provide a reservoir for grease and thus allowing extended re-greasing intervals
- Tolerant of relatively poor mating surface finish

SP

- Bush bore may be bored, reamed, broached or ball burnished in situ to control the assembled bearing clearance
- Suitable for oil or grease lubrication
- Steel backing provides strength and rigidity
- Hardened shafts are not required
- Thin wall construction permits compact bearing assembly

6 Physical and Mechanical Properties

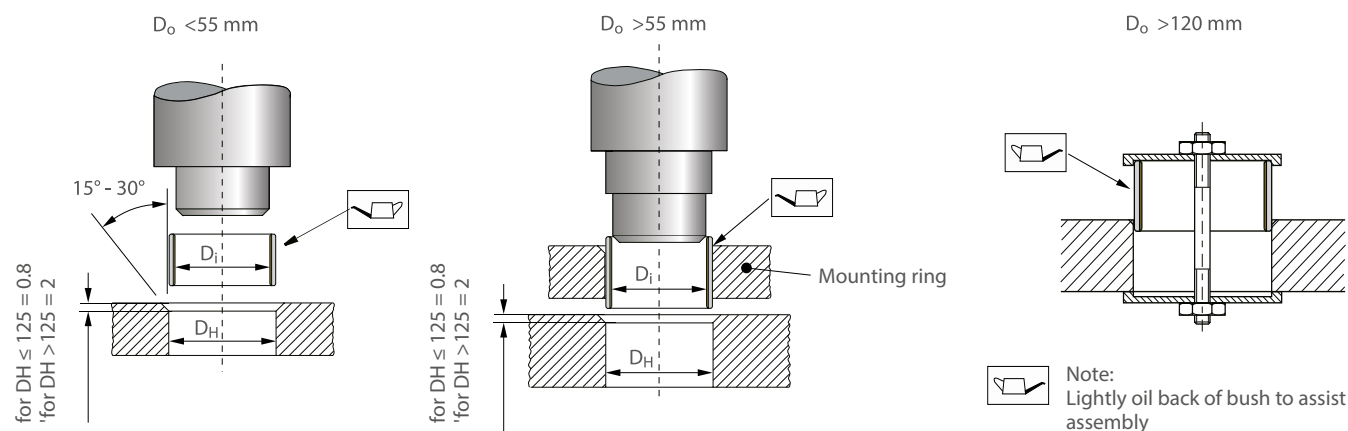
Typical sliding layer and bearing properties for AuGlide®, SY and SP products.

BEARING PROPERTIES		UNIT	AuGlide®	VALUE SY	SP
General					
Maximum load P	static	N/mm ²	300	300	250
	dynamic	N/mm ²	140	140	120
Operating temperature	min	°C	-40	-40	-40
	max greased	°C	150	150	150
	max oil lubricated	°C	250	250	250
Greased / Oil lubricated					
Maximum sliding speed V		m/s	2.5	2.5	2.5
Maximum PV factor		N/mm ² x m/s	2.8	2.8	2.8
Coefficient of friction f	greased		0.05 - 0.12	0.05 - 0.12	0.05 - 0.12
	oil lubricated		0.04 - 0.12	0.04 - 0.12	0.04 - 0.12
Recommendations					
Shaft surface roughness, R _a		µm	≤ 0.8	≤ 0.8	≤ 0.4
Shaft surface hardness	normal	HB		> 200	
	for longer service life			> 350	

Table 1: Physical and mechanical properties of AuGlide®, SY and SP

7 Installation

AuGlide®, SY and SP bushes should be inserted into the bearing housing with the aid of a stepped mandrel. Care must be taken to insert the bush squarely into the housing to avoid damage to the bearing lining material. A slight lead-in chamfer should be machined in the housing and a smear of oil applied to the outside surface of the bush to assist the fitting operation. Recommended mandrel and chamfer dimensions are given in figure 4.



8 Lubrication

AuGlide®, SY and SP bearings must be lubricated. Care should be taken at temperatures above 100 °C to avoid attack of the bearing lining due to acidic degradation products from the lubricant. Unlike polymer composite bearing materials, these materials are suitable for use with lubricants containing MoS₂ or graphite.

AuGlide® and SY

Suitable for use with oil or grease lubrication. For use with grease lubrication, the bearing surface is manufactured with a uniform pattern of indents which form a reservoir for the lubricant and provide the optimum distribution within the loaded area of the bearing.

SP

Suitable for use with oil or grease lubrication. Particularly suitable for high speed applications with oil lubrication.

9 Cutting and Machining

AuGlide® and SY

AuGlide® and SY bushes do not normally require sizing after assembly.

Should machining of the bearing lining be required then care should be taken to avoid any burrs around the edges of the indents in the bearing surface.

A diamond-tipped boring tool should be used with a fine feed of 0.1 mm/rev. and a cutting speed of 2 - 3 m/s.

SP

The bushes must be finish-sized after assembly. This may be done by burnishing, broaching or boring as described below.

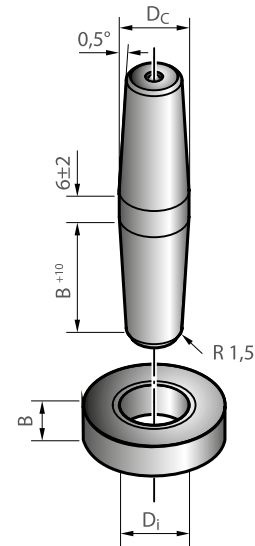
For many applications burnishing with a hardened sphere or spherically ended or ribbed tool will give adequate bore size. The required diameter (d_1) of the burnishing tool is as shown on the right to allow for recovery of the bearing bore after sizing.

If boring is carried out, care must be taken to maintain good concentricity with the housing.

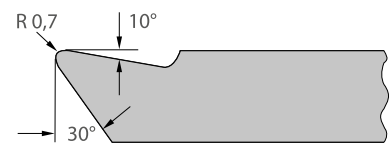
It is advisable to use H6 limits and work towards the maximum bore size.

The cutting tool should have a small point radius, approximately 0.7 mm, an approach angle of 30°, primary angle of 10° and a cutting speed of 2–3 m/s at a feed rate of 0.1 mm/rev.

$$d_1 \text{ calibration tool} = D_i + 0.0015 \text{ mm}$$



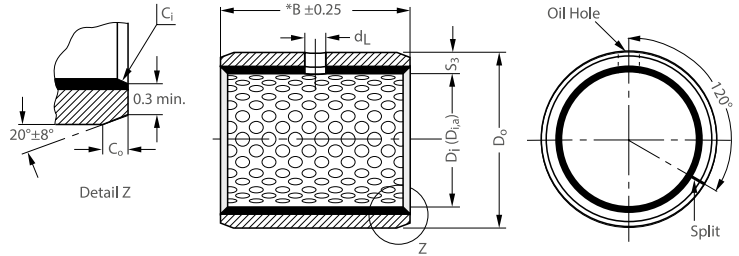
Cutting-tool geometry



Cutting speed 2 - 3 m/s

10 Standard Products

10.1 SY CYLINDRICAL BUSHES



Dimensions and Tolerances according to ISO 3547 and GGB Specifications

PART NO.	TECHNICAL DATA														
GGB	Nominal Diameter		Wall Thickness S ₃	Width	Shaft-Ø D _J h8	Housing-Ø D _H H7	Bush-Ø D _{ia} assembled in H7 housing	Clearance C _D	Oil Hole Ø d _L						
	D _i	D _o	max./min.	B	max./min.	max./min.	max./min.	max./min.							
PM2015SY	20	23	1.490 1.430	15	20.000 19.967	23.021 23.000	+ 0.161 + 0.020	0.194 0.020	4						
PM2025SY	20	23		25											
PM2030SY	20	23		30											
PM2215SY	22	25		15	22.000 21.967	25.021 25.000			+ 0.161 + 0.020	0.194 0.020					
PM2220SY	22	25		20											
PM2225SY	22	25		25											
PM2230SY	22	25		30											
PM2515SY	25	28		15	25.000 24.967	28.021 28.000						+ 0.161 + 0.020	0.194 0.020		
PM2520SY	25	28		20											
PM2525SY	25	28		25											
PM2530SY	25	28		30											
PM2815SY	28	32	1.980 1.920	15	28.000 27.967	32.025 32.000	+ 0.185 + 0.040	0.218 0.040							6
PM2820SY	28	32		20											
PM2825SY	28	32		25											
PM2830SY	28	32		30											
PM3015SY	30	34		15	30.000 29.967	34.025 34.000			+ 0.185 + 0.040	0.218 0.040	6				
PM3020SY	30	34		20											
PM3025SY	30	34		25											
PM3030SY	30	34		30											
PM3040SY	30	34		40											
PM3230SY	32	36		30	32.000 31.961	36.025 36.000		0.224 0.040							
PM3240SY	32	36		40											

AuGlide® cylindrical bearings are available on order

All dimensions in mm

PART NO.	TECHNICAL DATA								
GGB	Nominal Diameter		Wall Thickness S ₃	Width	Shaft-Ø D _J h8	Housing-Ø D _H H7	Bush-Ø D _{i,a} assembled in H7 housing	Clearance C _D	Oil Hole Ø d _L
	D _i	D _o	max./min.	B	max./min.	max./min.	max./min.	max./min.	
PM3515SY	35	39	1.980 1.920	15	35.000 34.961	39.025 39.000	+ 0.185 + 0.040	0.224 0.040	6
PM3520SY	35	39		20					
PM3525SY	35	39		25					
PM3530SY	35	39		30					
PM3535SY	35	39		35					
PM3540SY	35	39		40					
PM3545SY	35	39		45					
PM3550SY	35	39		50					
PM4020SY	40	44		20	40.000 39.961	44.025 44.000			
PM4030SY	40	44		30					
PM4040SY	40	44	40						
PM4050SY	40	44	50						
PM4060SY	40	44	60						
PM4530SY	45	50	2.460 2.400	30	45.000 44.961	50.025 50.000	+ 0.225 + 0.080	0.264 0.080	8
PM4540SY	45	50		40					
PM4550SY	45	50		50					
PM4560SY	45	50		60					
PM5020SY	50	55		20	50.000 49.961	55.030 55.000	+ 0.230 + 0.080	0.269 0.080	
PM5030SY	50	55		30					
PM5040SY	50	55		40					
PM5050SY	50	55		50					
PM5060SY	50	55		60	55.000 54.954	60.030 60.000		0.276 0.080	
PM5535SY	55	60		35					
PM5540SY	55	60		40					
PM5555SY	55	60		55					
PM5560SY	55	60		60	60.000 59.954	65.030 65.000			
PM6030SY	60	65		30					
PM6040SY	60	65		40					
PM6060SY	60	65		60					
PM6070SY	60	65		70	65.000 64.954	70.030 70.000			
PM6540SY	65	70		40					
PM6550SY	65	70	50						
PM6560SY	65	70	60						
PM6570SY	65	70	70						

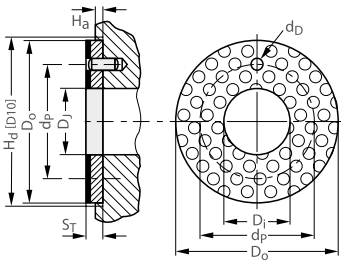
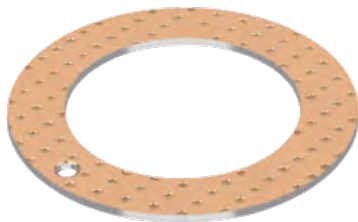
10 Standard Products

PART NO.	TECHNICAL DATA												
GGB	Nominal Diameter		Wall Thickness S ₃	Width	Shaft-Ø D _J h8	Housing-Ø D _H H7	Bush-Ø D _{ia} assembled in H7 housing	Clearance C _D	Oil Hole Ø d _L				
	D _i	D _o	max./min.	B	max./min.	max./min.	max./min.	max./min.					
PM7030SY	70	75	2.460 2.400	30	70.000 69.954	75.030 75.000	+ 0.230 + 0.080	0.276 0.080	8				
PM7040SY	70	75		40									
PM7045SY	70	75		45									
PM7050SY	70	75		50									
PM7065SY	70	75		65									
PM7080SY	70	75		80									
PM7540SY	75	80		40	75.000 74.954	80.030 80.000	+ 0.235 + 0.080	0.281 0.080	9.5				
PM7560SY	75	80		60									
PM7580SY	75	80		80									
PM8040SY	80	85		40	80.000 79.954	85.035 85.000							
PM8060SY	80	85		60									
PM8075SY	80	85		75									
PM8080SY	80	85		80									
PM8560SY	85	90		60	85.000 85.946	90.035 90.000		0.289 0.080					
PM9040SY	90	95		40	90.000 89.946	95.035 95.000							
PM9070SY	90	95		70									
PM9090SY	90	95		90									
PM10040SY	100	105		40	100.000 99.946	105.035 105.000							
PM10050SY	100	105		50									
PM10060SY	100	105		60									
PM10080SY	100	105		80									
PM10095SY	100	105		95									
PM12050SY	120	125		50	120.000 119.946	125.040 125.000	+ 0.240 + 0.080	0.294 0.080					
PM13560SY	135	140		60	135.000 134.937	140.040 140.000		0.303 0.080					

AuGlide® cylindrical bearings are available on order

All dimensions in mm

10.2 SY THRUST WASHERS



Dimensions and Tolerances according to ISO 3547 and GGB Specifications

PART NO.	TECHNICAL DATA					
GGB	Inside Ø D _i	Outside Ø D _o	Thickness S _T	Dowel Hole Ø D _D	Pitch Circle Ø d _p	Recess Depth H _a
	max./min.	max./min.	max./min.	max./min.	max./min.	max./min.
WC30SY	32.00 32.25	54.00 53.75	1.45 1.41	4.125 4.375	43.12 42.88	0.95 1.20
WC35SY	38.00 38.25	62.00 61.75			50.12 49.88	
WC40SY	42.00 42.25	66.00 65.75			54.12 53.88	
WC45SY	48.00 48.25	74.00 73.75	1.95 1.92		61.12 60.88	1.45 1.70
WC50SY	52.00 52.25	78.00 77.75			65.12 64.88	

AuGlide® thrust washers are available on order

All dimensions in mm

Bearing Application Data Sheet



Please complete the form below and share it with your sales engineer.

DATA FOR BEARING DESIGN CALCULATION

Application: _____

Project/No.: _____

Quantity: _____

☐ New Design

☐ Existing Design

☐ Steady Load

☐ Rotating Load

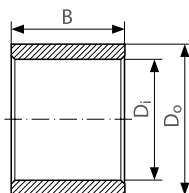
☐ Rotational Movement

☐ Oscillating Movement

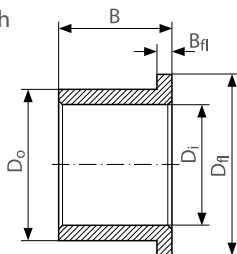
☐ Linear Movement

BEARING TYPE

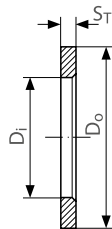
☐ Cylindrical bush



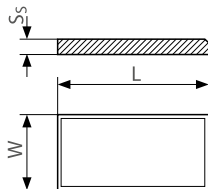
☐ Flanged bush



☐ Thrust washer



☐ Slide plate



☐ Special parts (sketch)

DIMENSIONS [MM]

Inside diameter	D_i	
Outside diameter	D_o	
Length	B	
Flange diameter	D_{fi}	
Flange thickness	B_{fi}	
Wall thickness	S_T	
Length of slideplate	L	
Width of slideplate	W	
Thickness of slideplate	S_s	

LOAD

☐ Static load

☐ Dynamic load

Axial load F [N]

Radial load F [N]

MOVEMENT

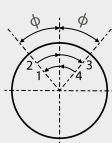
Rotational speed N [1/min]

Speed V [m/s]

Length of stroke L_s [mm]

Frequency of stroke [1/min]

Oscillating cycle



Osc. frequency N_{osz} [1/min]

MATING SURFACE

Material

Hardness HB/HRC

Surface finish R_a [μm]

FITS & TOLERANCES

Shaft	D_j	
Bearing housing	D_H	

OPERATING ENVIRONMENT

Ambient temperature T_{amb} [$^\circ$]

Bearing housing material

☐ Housing with good heating transfer properties

☐ Light pressing or insulated housing with poor heat transfer properties

☐ Non metal housing with poor heat transfer properties

☐ Alternate operation in water and dry

OPERATING ENVIRONMENT

☐ Dry

☐ Continuous lubrication

☐ Process fluid lubrication

☐ Initial lubrication only

☐ Hydrodynamic conditions

Process fluid

Lubricant

Dynamic viscosity η [mPas]

SERVICE HOURS PER DAY

Continuous operation

Intermittent operation

Operating time

Days per year

SERVICE LIFE

Required service life L_H [h]

CUSTOMER INFORMATION

Company _____

Street _____

City / State / Province / Post Code _____

Telephone _____ Fax _____

Name _____

Email Address _____ Date _____

Product Information

This document is provided to give you the analysis tools or information to assist you in product selection. Product performance is affected by many factors beyond the control of GGB. Therefore, you must validate the suitability and feasibility of all product selections for your applications.

GGB products are sold subject to GGB's Terms of Sale and Delivery, which include our limited warranty and remedy. You can find these here: ggbearings.com/en/terms-and-conditions, or ask your GGB representative for a copy.

Products are subject to continual development. GGB retains the right to make specification amendments or improvements to the technical data without prior announcement.

DOCUMENT INFORMATION

Edition 2026. This edition replaces earlier editions which hereby lose their validity.

Every reasonable effort has been made to ensure the accuracy of the information in this writing, but GGB assumes no liability for errors or omissions or for any other reason.

HEALTH AND SAFETY

GGB is committed to adhering to all U.S., European and international standards and regulations with regard to lead content. We have established internal processes that monitor any changes to existing standards and regulations, and we work collaboratively with customers and distributors to ensure that all requirements are followed. This includes RoHS and REACH guidelines. GGB is committed to operating in an environmentally conscious and safe manner. We follow numerous industry best practices and are committed to meeting or exceeding a variety of internationally recognized standards for emissions control and workplace safety.

Each of our global locations has management systems in place that adhere to IATF 16949, ISO 9001, ISO 14001 and ISO 45001 quality regulations. Our certificates can be found here: ggbearings.com/en/certificates.

A detailed explanation of our commitment to REACH and RoHS directives can be found at ggbearings.com/en/reach-rohs.

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Stronger.Together.



ggbearings.com

IN112ENG05-26

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