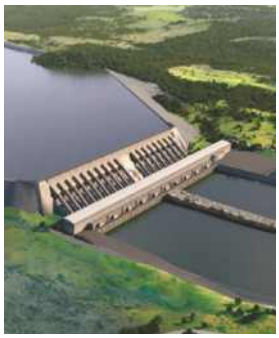
Product Range

United Kingdom



The Global Leader
in High Performance Bearing Solutions

GGB
BEARING TECHNOLOGY

an EnPro Industries company





The Global Leader in High Performance Bearing Solutions

Setting the industry standards as the global leader in high performance bearing solutions, GGB is dedicated to supplying customers worldwide with both standard and customized plain bearings. With over 1,100 employees globally, GGB's dedicated team of experts has the experience and expertise to provide innovative, reliable and effective solutions.

GGB's wide choice of product materials includes metal-polymer, solid polymer, filament wound, metal bearings, bushing blocks and thrust plates as well as specialized housings and assemblies all available in standard or custom sizes and shapes, and manufactured to precise specifications. Application experts work alongside our customers from start to finish, assisting in the design, material selection, testing, manufacture, assembly and installation to find the ideal bearing solution for even the most challenging applications.

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
- Agricultural
- Automotive
- Compressors
- Construction
- Oil & Gas
- Energy
- Fluid Power
- General Industrial
- Primary Metals
- Recreation





The GGB Advantage

Lower System Cost

GGB bearings reduce shaft costs by eliminating the need for hardening and machining grease paths. Their compact, one-piece construction provides space and weight savings and simplifies assembly.

Low Friction, High Wear Resistance

Low coefficients of friction eliminate the need for lubrication, while providing smooth operation, reducing wear and extending service life. Low friction also eliminates the effects of stick-slip or “stiction” during start up.

Maintenance-Free

GGB bearings are self-lubricating, making them ideal for applications requiring long bearing life without continuous maintenance, as well as operating conditions with inadequate or no lubrication.

Environmental

Greaseless, lead-free GGB bearings comply with increasingly stringent environmental regulations such as the EU RoHS directive restricting the use of hazardous substances in certain types of electrical and electronic equipment.

Customer Support

GGB’s flexible production platform and extensive supply network assure quick turnaround and timely deliveries. In addition, we offer local applications engineering and technical support.

Trademarks

GGB®, DP4®, DP4-B™, DU®, DU-B™, DP10™, DP11™, DP31™, DX®, DX®10, HI-EX®, DTS10®, DS™, EP®, EP®12, EP®22, EP®43, EP®44, EP®63, EP®64, EP®73, EP®79, FLASH-CLICK®, KA™Glacetal, Multilube™, GAR-MAX®, SBC™, GAR-FIL™, HSG™, MLG™, HPMB®, HPM™, HPF™, MEGALIFE, Multifil™, SICAL®3, SICAL®3D, PICAL®2, PICAL®3, GGB-CSM®, GGB-CBM®, GGB-SZ™, DB™, SY™, SP™, UNI™ and MINI™ are registered trademarks or trademarks, as the case may be, of GGB and its affiliates.

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EXALIGN™ *is a product of Cryptic Arvis Ltd., Leicester, UK*

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The Highest Standards in Quality

Our world-class manufacturing plants in the United States, Brazil, China, Germany, France and Slovakia are certified in quality and excellence according to ISO 9001, TS 16949, ISO 14001, ISO 50001 and OHSAS 18001. 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:
www.ggbearings.com/en/company/certificates

A Long History of Innovation

From our modest beginnings over 115 years ago, GGB grew through innovation and technical expertise to become the world's leading manufacturer of plain bearing solutions.

1899

Findlay and Battle founded Findlay Motor Metals. The company was renamed to Glacier Antifriction Metal Company two years later.

1910s

Began making plain bearings in response to increased demand for internal combustion engines.

1956

Inroduced DU®, the world's first steel backed metal-polymer bearing material with bronze and PTFE lining offering excellent low friction and wear resistance performance. Introduced DU-B™ with bronze backing for improved corrosion resistance.

1958

Garlock Inc. was founded as a bearing distributor when an agreement was reached with Glacier.

1965

Launched the marginally lubricated DX® metal-polymer material for greased applications.

1996

Launched new EP® solid polymer materials.

2003

Introduced lead-free DP31™ metal-polymer material with improved performance under lubricated conditions. Acquired Saver North America, a producer of self-lubricating composite bearings. Glacier Garlock Bearings expanded business in Asia

2007

Introduced SBC™ (Sealed Bearing Cartridges) for off-highway equipment applications. Acquired Böhringer Kunststofftechnik GmbH precision injection molder of high-performance solid polymer solutions.

2002

Goodrich Corporation spun off its engineered industrial products division, creating EnPro Industries Inc., the new parent company of Glacier Garlock Bearings.

2004

Glacier Garlock Bearings changed name to GGB. Opened new manufacturing plant Sučany, Slovakia

2008

Production facility opened in Suzhou, China; new DX®10 with DuraStrong™ technology bearings won Frost & Sullivan's product innovation of the year award in the Class 7-8 truck bearings category.

1974

Began continuous casting of the SICAL® range of aluminum alloys and high precision machining of bushing blocks in Dieuze, France.

1978

Introduced filament wound product range in the USA, including GAR-MAX®.

1995

Introduced lead-free steel backed DP4® metal-polymer material for automotive shock absorbers and other hydraulic applications. Introduced DP4-B™ with bronze backing for improved corrosion resistance.

1970s

Glacier licensed technology to a number of overseas bearing manufacturers. Licenses included: SIC (France), Garlock Bearings (USA).

1976

Glacier and Garlock Inc. established joint venture company Garlock Bearings Inc.

1986

Launched HI-EX® metal-polymer material, designed for high temperature applications.

2009

Filament-wound product range introduced to the European and Asian markets; GGB North America certified to AS9100B, the aerospace industry's standard for quality management systems.

2011

Acquired PI Bearing Technologies, now GGB Chicago, a producer of PICAL® aluminum alloy bushing blocks for demanding fluid power applications. GGB plants certified to OHS18001 for health and safety management systems.

2013

Launched new self-lubricating metallic bearing materials GGB-CSM® and GGB-CBM® as well as FLASH-CLICK® two-piece, double-flanged solid polymer bearings.

2010

Introduced lead-free DP10™ and DP11™ metal-polymer materials for superior performance under marginally lubricated and dry running conditions.

2012

DTS10™ machinable metal-polymer bearings are launched for the fluid power and compressor markets. GGB bearings land on Mars aboard NASA's Curiosity rover.

2014

Series of self-lubricating sintered bronze and sintered iron bearings introduced, including GGB-BP25, GGB-FP20 and GGB-SO16.

Three plants mark milestone anniversaries: 40 years for Heilbronn, Germany and Dieuze, France and 10 years for Sučany, Slovakia.

2015

Introduced HPMB®, a fully machinable, made-to-order filament wound bearing material.

Also introduced the lead-free GGB-SZ, for high specific loads with low-frequency, oscillating motion.

Product Range ›
Overview of Bearing Materials & Products

Material Name	Metal-Polymer Materials	Working Conditions	Page
DP4®	Steel + Porous Bronze Sinter + PTFE + Fillers	self lubricating, low-maintenance	11
DP4-B™	Bronze + Porous Bronze Sinter + PTFE + Fillers	self lubricating, corrosion resistant	12
DU®	Steel + Porous Bronze Sinter + PTFE + Pb	self lubricating	13
DU-B™	Bronze + Porous Bronze Sinter + PTFE + Pb	self lubricating, corrosion resistant	14
DP10™	Steel + Porous Bronze Sinter + PTFE + Solid Lubricants	self lubricating, low-maintenance	15
DP11™	Steel + Porous Bronze Sinter + PTFE + Solid Lubricants + Fillers	self lubricating, low-maintenance	16
DP31™	Steel + Porous Bronze Sinter + PTFE + Fluoropolymer + Fillers	low-maintenance	17
DX®	Steel + Porous Bronze Sinter + POM with Lubrication indents	low-maintenance	18
DX®10	Steel + Porous Bronze Sinter + High Tech Polymer with or without Lubrication indents	low-maintenance	19
HI-EX®	Steel + Porous Bronze Sinter + PEEK + PTFE + Fillers	low-maintenance	20
DTS10®	Steel + Porous Bronze Sinter + PTFE + Fillers	low-maintenance, machinable	21
DS™	Steel + Porous Bronze Sinter + POM Modified	self lubricating, low-maintenance	22

Material Name	Solid Polymer Materials	Working Conditions	Page
EP®	PA6.6T + Solid Lubricant + Fillers	self lubricating	23
EP®12	POM + Solid Lubricant	self lubricating	24
EP®22	PBT + Solid Lubricant	self lubricating	25
EP®43	PPS + Solid Lubricant + Fillers	self lubricating	26
EP®44	PPS + Solid Lubricant + Fillers	self lubricating	27
EP®63	PEEK + Solid Lubricant + Fillers	self lubricating	28
EP®64	PEEK + Solid Lubricant + Fillers	self lubricating	29
EP®73	PAI + Solid Lubricant + Fillers	self lubricating	30
EP®79	PAI + Solid Lubricant + Fillers	self lubricating	31
KA™ Glacetal	POM + Solid Lubricant	self lubricating, low-maintenance	32
Multilube™	POM + Solid Lubricant + Fillers	self lubricating	33

Material Name	Filament Wound Materials	Working Conditions	Page
GAR-MAX®	Continuous wound PTFE and high-strength fibers encapsulated in an internally lubricated, high temperature filled epoxy resin sliding layer + continuous wound fiberglass encapsulated in a high temperature epoxy resin	self lubricating	34
GAR-FIL™	Proprietary filled PTFE tape liner + continuous wound fiberglass encapsulated in a high temperature epoxy resin	self lubricating	35
HSG™	Continuous wound PTFE and high-strength fibers encapsulated in an internally lubricated, high temperature filled epoxy resin sliding layer + continuous wound fiberglass encapsulated in a high temperature epoxy resin	self lubricating	36
MLG™	Continuous wound PTFE and high-strength fibers encapsulated in an internally lubricated, high temperature filled epoxy resin sliding layer + continuous wound fiberglass encapsulated in a high temperature epoxy resin	self lubricating	37
HPMB® NEW	Machinable continuous wound PTFE and high-strength fibers encapsulated in an internally lubricated, high temperature filled epoxy resin sliding layer + continuous wound fiberglass encapsulated in a high temperature epoxy resin	self lubricating	38
HPM™	Continuous wound PTFE and high-strength fibers encapsulated in an internally lubricated, high temperature filled epoxy resin sliding layer + continuous wound fiberglass encapsulated in a high temperature epoxy resin	self lubricating	39
HPF™	Proprietary filled PTFE tape liner + continuous woven cloth laminate impregnated and cured with epoxy resin	self lubricating	40
MEGALIFE XT	Proprietary filled PTFE tape liner on both sides + continuously woven layer of filament glass fiber encapsulated in a high temperature epoxy resin	self lubricating	41
Multifil™	PTFE + proprietary filler system	self lubricating	42
SBC™ with GAR-MAX®	Composite material with sealing SBC bearings are available with GAR-MAX are sealed to exclude containments. SBC are optionally available with a steel outer shell.	self lubricating, low-maintenance	43
SBC™ with HSG™	Composite material with sealing SBC bearings are available with HSG are sealed to exclude containments. SBC are optionally available with a steel outer shell.	self lubricating, low-maintenance	44

Material Name	Bushing Blocks & Thrust Plates	Working Conditions	Page
SICAL®3	Aluminum alloys, for use with different GGB cylindrical bushes	depends on bearing material	45
SICAL®3D	Aluminum alloys, for use with different GGB cylindrical bushes	depends on bearing material	45
PICAL®2	Aluminum alloys, for use with different GGB cylindrical bushes	depends on bearing material	46
PICAL®3	Aluminum alloys, for use with different GGB cylindrical bushes	depends on bearing material	46

Material Name	Metal & Bimetal	Working Conditions	Page
GGB-CSM®	Powder metallurgical monometallic bearing material (bronze, nickel or iron-based) + solid graphite lubricant, MoS_2	self lubricating	47
GGB-CBM®	Thin walled powder metallurgical bimetal bearing material stainless steel, carbon steel or bronze with bronze + based backing): + solid graphite lubricant	self lubricating	48
GGB-BP25	Sintered bronze impregnated with oil, similar to SINT A 50, impregnation group 1	self lubricating	49
GGB-FP20	Steel alloy sinter impregnated with oil, similar to SINT A 10, impregnation group 1	self lubricating	50
GGB-SO16	Sintered steel alloy impregnated with oil	self lubricating	51
GGB-SZ™ NEW	Steel backing and lead-free bronze overlay	low maintenance	52
SY™	Steel backing and leaded bronze overlay + CuPb10Sn10	low maintenance	53
SP™	Steel backing and leaded bronze overlay + CuPb26Sn2	low maintenance	54
DB™	Dry bearing material: cast bronze + solid lubricant inserts	self lubricating	55
Solid Bronze	Solid bronze alloy bearings	conventional lubrication	56

Material Name	Bearing Assemblies	Working Conditions	Page
UNI™	Self-aligning bearing housings	self lubricating	57
MINI™	Self-aligning bearing housings	self lubricating	58
EXALIGN™	Self-aligning bearing housings	self lubricating	59

Product Range ›
Additional Information

DP4® Bearing Material

STRUCTURE

Metal-Polymer Composite Material

CHARACTERISTICS

- Good wear and low friction performance over a wide range of loads, speeds and temperatures in dry running conditions
- Very good performance in lubricated applications
- Good performance in greased applications
- Suitable for linear, oscillating and rotating movements
- Lead-free material compliant to EVL, WEEE, and RoHS specifications
- Approved to standard DIN EN 1797: 2002-02 and ISO 21010: 2004-04 (Cryogenic Vessels – Gas/Material Compatibility) for piping, valves, fittings and other components in both gaseous and liquid oxygen for up to maximum temperature of 60°C and oxygen pressure of 25 bars. Contact GGB for further details.

AVAILABILITY

Bearing forms available in standard dimensions

- Cylindrical bushes
- Flanged bushes
- Flanged Washers
- Sliding plates
- Thrust washers

Bearing forms made to order: Standard forms in special dimensions, half-bearings, special shapes obtained by stamping or deep drawing, bearings with locating notches, lubricant holes and machined/stamped grooves, customized bearing designs

APPLICATIONS

Automotive: Braking systems, clutches, gearbox and transmissions, hinges: door, bonnet, boot, cabriolet roof tops, pedals; pumps: axialpiston, radial piston, gear and vane; seat mechanisms, steering systems, struts and shock absorbers, wiper systems, etc.

Industrial: Aerospace, agricultural equipment, construction equipment, food and beverage, material handling equipment, forming machines: metal, plastic and rubber; office equipment, medical and scientific equipment, packaging equipment, pneumatic and hydraulic cylinders, pumps and motors, railroad and tramways, textile machinery, valves, etc.

Microsection

Operating Performance	
Dry	Good
Oil lubricated	Very Good
Grease lubricated	Good
Water lubricated	Fair
Process fluid lubricated	Good

DP4® Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	250 140
Operating temperature	Min Max	°C °C	- 200 280
Coefficient of linear thermal expansion	Parallel to the surface Normal to the surface	$10^{-6}/K$ $10^{-6}/K$	11 30
Dry			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm^2 x m/s	1,0
Coefficient of friction f			0,04 - 0,25
Oil Lubricated			
Maximum sliding speed, U		m/s	5,0
Maximum pU factor		N/mm^2 x m/s	10,0
Coefficient of friction f			0,02 - 0,08
Recommendations			
Shaft surface roughness, Ra	Dry Lubricated	µm µm	0,3 - 0,5 ≤ 0,05 -0,4*
Shaft surface hardness	Unhardened acceptable, improved bearing life	HB	> 200

* Depending on operating conditions

DP4-B™ Bearing Material

STRUCTURE

Metal-Polymer Composite Material

CHARACTERISTICS

- Good wear and low friction performance over a wide range of loads, speeds and temperatures in dry running conditions
- Very good performance in lubricated applications
- Good performance in greased applications
- Suitable for linear, oscillating and rotating movements
- Bronze back offers improved corrosion resistance in humid/saline environments
- Lead-free material compliant to EVL, WEEE, and RoHS specifications

AVAILABILITY

Bearing forms available in standard dimensions

- Cylindrical bushes
- Flanged bushes
- Sliding plates

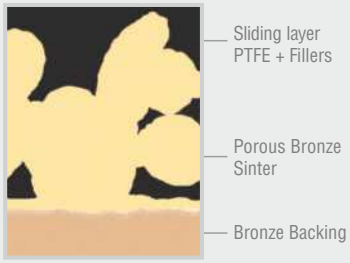
Bearing forms made to order: Standard forms in special dimensions, thrust washers, flanged thrust washers, half-bearings, special shapes obtained by stamping or deep drawing, bearings with locating notches, lubricant holes and machined / stamped grooves

APPLICATIONS

Industrial: Aerospace, agricultural equipment, construction equipment, material handling equipment, forming machines - metal, plastic and rubber; office equipment, medical and scientific equipment, packaging equipment, pneumatic and hydraulic cylinders, pumps and motors, railroad and tramways, textilemachinery, valves, etc.

Others: Civil engineering, marine and offshore equipment, other applications in water or in outdoor environments, etc.

Microsection



Operating Performance	
Dry	Good
Oil lubricated	Very Good
Grease lubricated	Good
Water lubricated	Good
Process fluid lubricated	Good

DP4-B™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	140 140
Operating temperature	Min Max	°C °C	- 200 280
Coefficient of linear thermal expansion	Parallel to the surface Normal to the surface	$10^{-6}/K$ $10^{-6}/K$	18 36
Dry			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm^2 x m/s	1,0
Coefficient of friction f			0,04 - 0,25*
Oil Lubricated			
Maximum sliding speed, U		m/s	5,0
Maximum pU factor		N/mm^2 x m/s	10,0
Coefficient of friction f			0,02 - 0,08
Recommendations			
Shaft surface roughness, Ra	Dry Lubricated	µm µm	0,3 - 0,5 ≤ 0,05 -0,4*
Shaft surface hardness	Unhardened acceptable, improved bearing life	HB	> 200

* Depending on operating conditions

DU® Bearing Material

STRUCTURE

Metal-Polymer Composite Material

CHARACTERISTICS

- Very good wear and low friction performance over a wide range of loads, speeds and temperatures in dry running conditions
- Suitable for lubricated applications
- Suitable for linear, oscillating and rotating movements

AVAILABILITY

Bearing forms available in standard dimensions

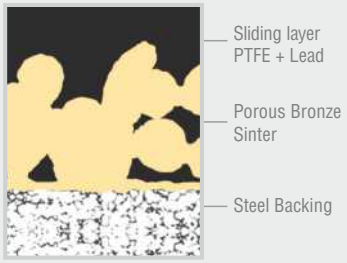
- Cylindrical bushes
- Flanged bushes
- Flanged Washers
- Sliding plates
- Thrust washers

Bearing forms made to order: Standard forms in special dimensions, half-bearings, special shapes obtained by stamping or deep drawing, customized bearing designs

APPLICATIONS

Industrial: Aerospace, agricultural equipment, construction equipment, food and beverage, material handling equipment, forming machines: metal, plastic and rubber; office equipment, medical and scientific equipment, packaging equipment, pneumatic and hydraulic cylinders, pumps and motors, railroad and tramways, textile machinery, valves, etc.

Microsection



Operating Performance	
Dry	Very Good
Oil lubricated	Good
Grease lubricated	Fair
Water lubricated	Fair
Process fluid lubricated	Fair

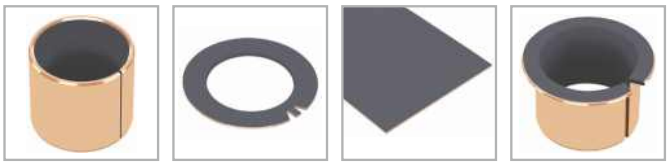
For Superior Performance	
Dry	DP4 / DP11
Oil lubricated	DP4 / DP31
Grease lubricated	DP4 / DX
Water lubricated	DP4-B
Process fluid lubricated	DP4 / DP31

DU® Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	250 140
Operating temperature	Min Max	°C °C	- 200 280
Coefficient of linear thermal expansion	Parallel to the surface Normal to the surface	$10^{-6}/K$ $10^{-6}/K$	11 30
Dry			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm^2 x m/s	1,8
Coefficient of friction f			0,02 - 0,25*
Oil Lubricated			
Maximum sliding speed, U		m/s	5,0
Maximum pU factor		N/mm^2 x m/s	5,0
Coefficient of friction f			0,02 - 0,12
Recommendations			
Shaft surface roughness, Ra	Dry Lubricated	µm µm	0,3 - 0,5 ≤ 0,05 -0,4*
Shaft surface hardness	Unhardened acceptable, improved bearing life	HB	> 200

* Depending on operating conditions

DU-B™ Bearing Material



STRUCTURE

Metal-Polymer Composite Material

CHARACTERISTICS

- Very good wear and low friction performance over a wide range of loads, speeds and temperatures in dry running conditions
- Suitable for lubricated applications
- Suitable for linear, oscillating and rotating movements
- Bronze back offers improved corrosion resistance in humid/saline environments
- Approved to standard EN1337-2 for structural bearings for civil engineering

AVAILABILITY

Bearing forms available in standard dimensions

- Cylindrical bushes
- Flanged bushes
- Sliding plates

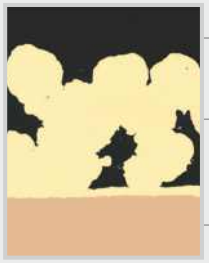
Bearing forms made to order: Standard forms in special dimensions, thrust washers, flanged thrust washers, half-bearings, special shapes obtained by stamping or deep drawing, customized bearing designs

APPLICATIONS

Industrial: Aerospace, agricultural equipment, construction equipment, material handling equipment, forming machines - metal, plastic and rubber; office equipment, medical and scientific equipment, packaging equipment, pneumatic and hydraulic cylinders, pumps and motors, railroad and tramways, textile machinery, valves, etc.

Others: Marine and offshore equipment, other applications in water or in outdoor environments

Microsection



Operating Performance	
Dry	Very Good
Oil lubricated	Good
Grease lubricated	Fair
Water lubricated	Good
Process fluid lubricated	Fair

For Superior Performance	
Dry	DP4-B
Oil lubricated	DP4-B
Grease lubricated	DP4-B
Water lubricated	DP4-B
Process fluid lubricated	DP4-B

DU-B™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	140 140
Operating temperature	Min Max	°C °C	- 200 280
Coefficient of linear thermal expansion	Parallel to the surface Normal to the surface	$10^{-6}/K$ $10^{-6}/K$	18 36
Dry			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm^2 x m/s	1,8
Coefficient of friction f			0,02 - 0,25*
Oil Lubricated			
Maximum sliding speed, U		m/s	5,0
Maximum pU factor		N/mm^2 x m/s	5,0
Coefficient of friction f			0,02 - 0,12
Recommendations			
Shaft surface roughness, Ra	Dry Lubricated	µm µm	0,3 - 0,5 ≤ 0,05 -0,4*
Shaft surface hardness	Unhardened acceptable, improved bearing life	HB	> 200

* Depending on operating conditions

DP10™ Bearing Material

STRUCTURE

Metal-Polymer Composite Material

CHARACTERISTICS

- Good wear and low friction performance over a wide range of loads, speeds and temperatures in dry running conditions
- Very good performance in lubricated applications particularly in marginally lubricated applications
- Suitable for linear, oscillating and rotating movements
- Lead-free material compliant to EVL, WEEE, and RoHS specifications

AVAILABILITY

Bearing forms available in standard dimensions

- Cylindrical bushes
- Flanged bushes
- Sliding plates
- Thrust washers

Bearing forms made to order: Standard forms in special dimensions, half-bearings, special shapes obtained by stamping or deep drawing, bearings with locating notches, lubricant holes and machined/stamped grooves, customized bearing designs

APPLICATIONS

Automotive: Braking systems, clutches, hinges – door, bonnet, boot, cabriolet roof tops, pedals, pumps – axial, piston, gear, vane, seat mechanisms, steering systems, struts and shock absorbers, wiper systems, etc.

Industrial: Agricultural equipment, compressors – scroll and reciprocating, construction equipment, food and beverage, material handling equipment, forming machines – metal, plastic and rubber, office equipment, medical and scientific equipment, packaging equipment, pneumatic and hydraulic cylinders, pumps and motors, railroad and tramways, textile machinery, valves, etc.

Microsection

Operating Performance	
Dry	Good
Oil lubricated	Good
Grease lubricated	Fair
Water lubricated	Not recommended
Process fluid lubricated	Fair

For Superior Performance	
Grease lubricated	DP4 / DX
Water lubricated	DP4-B
Process fluid lubricated	DP4 / DP31

DP10™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	250 140
Operating temperature	Min Max	°C °C	- 200 280
Coefficient of linear thermal expansion	Parallel to the surface Normal to the surface	$10^{-6}/K$ $10^{-6}/K$	11 30
Dry			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm^2 x m/s	1,0
Coefficient of friction f			0,03 - 0,25*
Oil Lubricated			
Maximum sliding speed, U		m/s	5,0
Maximum pU factor		N/mm^2 x m/s	10,0
Coefficient of friction f			0,02 - 0,08
Recommendations			
Shaft surface roughness, Ra	Dry Lubricated	µm µm	0,3 - 0,5 ≤ 0,05 -0,4*
Shaft surface hardness	Unhardened acceptable, improved bearing life	HB	> 200

* Depending on operating conditions

DP11™ Bearing Material

AVAILABILITY

Bearing forms made to order: Cylindrical bushes, flanged bushes, thrust washers, flanged thrust washers, sliding plates, half-bearings, special shapes obtained by stamping or deep drawing, customized bearing designs

STRUCTURE

Metal-Polymer Composite Material

APPLICATIONS

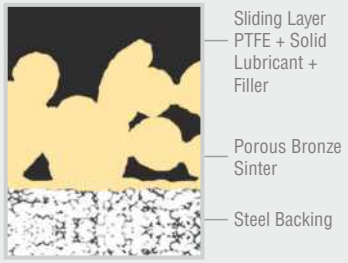
Automotive: Belt tensioners, clutches, dual mass fly-wheels, pulley dampers, etc.

Industrial: Applications with high frequency and low amplitude oscillating movements

CHARACTERISTICS

- Very good wear and low friction performance over a wide range of loads, speeds and temperatures in dry running conditions
- Particularly suited to dry applications with high frequency and low amplitude oscillating movements
- Suitable for linear, oscillating and rotating movements
- Lead-free material compliant to EVL, WEEE, and RoHS specifications

Microsection



Operating Performance	
Dry	Very Good
Oil lubricated	Good
Grease lubricated	Fair
Water lubricated	Not recommended
Process fluid lubricated	Fair

For Superior Performance	
Grease lubricated	DP4 / DX
Water lubricated	DP4-B
Process fluid lubricated	DP4 / DP31

DP11™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	250 140
Operating temperature	Min Max	°C °C	- 200 280
Coefficient of linear thermal expansion	Parallel to the surface Normal to the surface	10^{-6}/K 10^{-6}/K	11 30
Dry			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm² x m/s	1,0
Coefficient of friction f			0,04 - 0,25*
Oil Lubricated			
Maximum sliding speed, U		m/s	5,0
Maximum pU factor		N/mm² x m/s	10,0
Coefficient of friction f			0,02 - 0,08
Recommendations			
Shaft surface roughness, Ra	Dry Lubricated	µm µm	0,3 - 0,5 ≤ 0,05 -0,4*
Shaft surface hardness	Unhardened acceptable, improved bearing life	HB	> 200

* Depending on operating conditions

DP31™ Bearing Material

AVAILABILITY

Bearing forms made to order: Cylindrical bushes, flanged bushes, thrust washers, flanged thrust washers, sliding plates, half-bearings, bearings with locating notches, lubricant holes and machined/stamped grooves, customized bearing designs

STRUCTURE

Metal-Polymer Composite Material

APPLICATIONS

Automotive: Air conditioning compressors, gearbox and transmissions, heavy duty struts and shock absorbers, high performance pumps: axial piston, radial piston, gear, vane, etc.

Industrial: Compressors: scroll and reciprocating; pneumatic and hydraulic cylinders, high performance pumps axial piston, radial piston, gear, vane, etc.

CHARACTERISTICS

- Excellent low friction and wear resistance performance in lubricated applications
- Excellent flow erosion and cavitation resistance
- Very good fatigue strength
- Lead-free material compliant to EVL, WEEE, and RoHS specifications

Microsection

Operating Performance	
Dry	Fair
Oil lubricated	Very Good
Grease lubricated	Fair
Water lubricated	Fair
Process fluid lubricated	Good

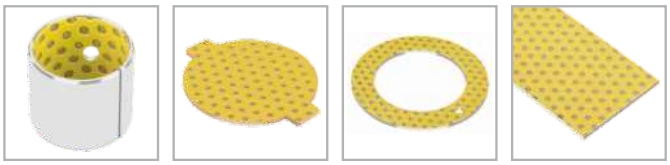
For Superior Performance	
Dry	DP4 / DP11
Grease lubricated	DP4 / DX
Water lubricated	DP4-B

DP31™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	250 140
Operating temperature	Min Max	°C °C	- 200 280
Coefficient of linear thermal expansion	Parallel to the surface Normal to the surface	$10^{-6}/K$ $10^{-6}/K$	11 30
Oil Lubricated			
Maximum sliding speed, U		m/s	10,0
Maximum pU factor		N/mm^2 x m/s	10,0
Coefficient of friction f			0,01 - 0,05
Recommendations			
Shaft surface roughness, Ra	Lubricated	µm	≤ 0,05 -0,4*
Shaft surface hardness	Unhardened acceptable, improved bearing life	HB	> 200

* Depending on operating conditions

DX® Bearing Material



STRUCTURE

Metal-Polymer Composite Material

CHARACTERISTICS

- Marginally lubricated bearing material for grease or oil lubricated applications
- Standard parts contain grease indents in the sliding layer; plain sliding layer available by request
- Optimum performance under relatively high loads and low speeds
- Suitable for linear, oscillating and rotating movements
- Wide range of parts available from stockand liquid oxygen for up to maximum temperature of 60°C and oxygen pressure of 25 bars. Contact GGB for further details.

AVAILABILITY

Bearing forms available in standard dimensions

- Cylindrical bushes
- Thrust washers
- Sliding plates

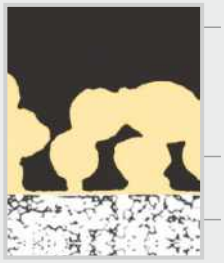
Bearing forms made to order: Standard forms in special dimensions, half-bearings, special shapes obtained by stamping, bearings with locating notches, lubricant holes and machined grooves, customized bearing designs

APPLICATIONS

Automotive: Steering gear, power steering, pedal bushes, seat slides, king-pin bushes, tailgate pivots, brake caliper bushes, etc.

Industrial: Mechanical handling and lifting equipment, machine slides, hydraulic cylinders, hydraulic motors, ski-lifts, pneumatic equipment, medical equipment, textile machinery, agricultural equipment, scientific equipment, etc.

Microsection



Operating Performance	
Dry	Poor
Oil lubricated	Good
Grease lubricated	Very Good
Water lubricated	Poor
Process fluid lubricated	Poor

For Superior Performance	
Dry	GAR-MAX / HSG / GAR-FIL / MLG
Water lubricated	HPM / HPF / DP4-B
Process fluid lubricated	DP4 / HI-EX / GAR-FIL

DX® Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	140 70
Operating temperature	Min Max	°C °C	- 40 130
Coefficient of linear thermal expansion	Parallel to the surface Normal to the surface	$10^{-6}/K$ $10^{-6}/K$	11 29
Grease Lubricated			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm^2 x m/s	2,8
Coefficient of friction f			0,06 - 0,12
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,4
Shaft surface hardness	Normal For longer service life	HB	> 200 > 350

* Depending on operating conditions

DX®10 Bearing Material

AVAILABILITY

Bearing forms made to order: Cylindrical bushes, thrust washers, sliding plates, half-bearings, special shapes obtained by stamping, bearings with locating notches, lubricant holes and machined grooves, customized bearing designs

STRUCTURE

Metal-Polymer Composite Material

CHARACTERISTICS

- Perfect for heavy duty and harsh environments
- Excellent chemical resistance
- Excellent erosion resistance
- Good fatigue strength
- Good wear performance
- Can be broached for tighter tolerance
- Lead-free material compliant to EVL, RoHS and WEEE specifications

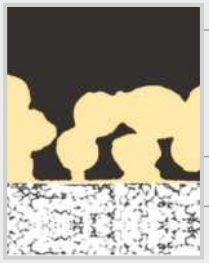
APPLICATIONS

General: Greased or oiled applications with high load, high temperature, and contamination; ideal for replacing bi-metal or bronze bushings to achieve improved wear performance

Automotive: King pins, oil pumps

Industrial: Piston pumps, agriculture equipment, construction, lift and cranes, small reciprocating bushing

Microsection



Operating Performance	
Dry	Fair
Oil lubricated	Very Good
Grease lubricated	Very Good
Water lubricated	Poor
Process fluid lubricated	Fair

For Superior Performance	
Dry	GAR-MAX / HSG / GAR-FIL / MLG
Water lubricated	HPF / HPM / DP4-B
Process fluid lubricated	DP4 / HI-EX / GAR-FIL

DX®10 Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	250 140
Operating temperature	Min Max	°C °C	- 40 175
Grease Lubricated			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm² x m/s	2,8
Coefficient of friction f			0,01 - 0,1
Oil Lubricated			
Maximum sliding speed, U		m/s	10,0
Maximum pU factor		N/mm² x m/s	2,8
Coefficient of friction f			0,01 - 0,06
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,4
Shaft surface hardness	Normal For longer service life	HB	> 200 > 350

* Depending on operating conditions

HI-EX® Bearing Material

AVAILABILITY

Bearing forms made to order: Cylindrical bushes, thrust washers, sliding plates, half-bearings, special shapes obtained by stamping, bearings with locating notches, lubricant holes and machined grooves, customized bearing designs

STRUCTURE

Metal-Polymer Composite Material

APPLICATIONS

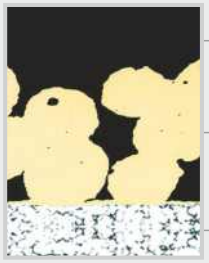
Automotive: Diesel fuel pumps, ABS equipment

Industrial: Hydraulic motors and pumps, agricultural equipment, wind energy equipment, yaw and teeter bearings

CHARACTERISTICS

- Marginally lubricated bearing material with good wear resistance under thin film conditions
- Standard bearings supplied with indents for optimum retention and distribution of the lubricant over the sliding layer
- Available with non-indented overlay for hydrodynamic applications
- Rated for high temperature use up to 250°C / 480°F
- Suitable for use with low viscosity fluids
- Good chemical resistance
- Lead-free material compliant to EVL, RoHS and WEEE specifications

Microsection



Operating Performance	
Dry	Fair
Oil lubricated	Good
Grease lubricated	Very Good
Water lubricated	Good
Process fluid lubricated	Good

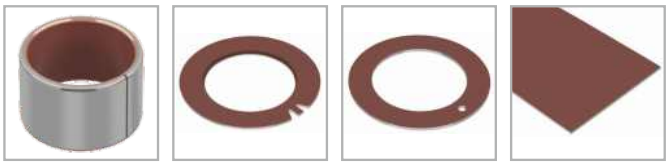
For Superior Performance	
Dry	GAR-MAX / HSG / GAR-FIL / MLG

HI-EX® Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	140 100
Operating temperature	Min Max	°C °C	- 150 250
Coefficient of linear thermal expansion	Parallel to the surface Normal to the surface	$10^{-6}/K$ $10^{-6}/K$	11 29
Grease Lubricated			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm^2 x m/s	2,8
Coefficient of friction f			0,08 - 0,12
Oil Lubricated			
Maximum sliding speed, U		m/s	10,0*
Maximum pU factor		N/mm^2 x m/s	10,0*
Coefficient of friction f			0,03 - 0,08
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,05 - 0,4*
Shaft surface hardness	Normal For longer service life	HB	> 200 > 350

* Depending on operating conditions

DTS10™ Bearing Material



STRUCTURE

Metal-Polymer Composite Material

CHARACTERISTICS

- The first polymer-lined bearing for lubricated conditions offering low friction and high wear resistance that is designed to be machined on-site for tight tolerances
- Excellent wear resistance and low friction in lubricated hydraulic applications
- Excellent chemical resistance, fatigue strength, cavitation and flow erosion resistance, and good behavior in dry start-up conditions
- A minimum overlay thickness of 0.1 mm permits, under carefully controlled conditions, machining of the assembled bore for improved dimensional tolerance and reduced geometric defects, while retaining a thin layer of PTFE sliding surface
- Compatible with most standard machining processes including turning, broaching, reaming, and milling
- Lead-free material compliant to EVL, RoHS and WEEE specifications

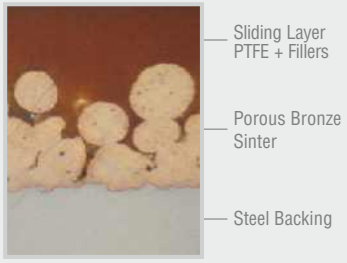
AVAILABILITY

Bearing forms made to order: Standard forms in special dimensions, half-bearings, special shapes obtained by stamping or deep drawing, bearings with locating notches, lubricant holes and machined/stamped grooves, customized bearing designs

APPLICATIONS

Industrial: Compressors: scroll and reciprocating, pumps and motors: external and internal gear, pumps, vane pumps, axial and radial piston pumps, gerotor pumps, hydraulic cylinders, etc.

Microsection



Operating Performance	
Dry	Fair
Oil lubricated	Excellent
Grease lubricated	Fair
Water lubricated	Fair
Process fluid lubricated	Good

For Superior Performance	
Dry	GAR-MAX / HSG / GAR-FIL / MLG
Grease lubricated	DX / DX10
Water lubricated	HPM / HPF / DP4-B

DTS10™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static	N/mm²	140
Operating temperature	Min Max	°C °C	- 200 280
Fluid Lubricated			
Maximum sliding speed, U		m/s	10
Maximum pU factor		N/mm² x m/s	100
Coefficient of friction f			0,01 - 0,08
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,05 - 0,2*
Shaft surface hardness		HB	> 200

* Depending on operating conditions

DS™ Bearing Material

STRUCTURE

Metal-Polymer Composite Material

CHARACTERISTICS

- Self-lubricating bearing material for operation in mixed film lubrication conditions
- Sliding layer is machinable (ca. 0,4 mm above bronze sinter layer)
- Resistant to fretting corrosion damage to the shaft under low amplitude oscillating movements
- Similar in performance to DX® but with lower friction

AVAILABILITY

Bearing forms made to order: Cylindrical bushes, thrust washers, sliding plates, half-bearings, special shapes obtained by stamping, customized bearing designs

APPLICATIONS

Automotive: Steering gear, power steering, pedal bushes, seat slides, king-pin bushes, tailgate pivots, brake caliper bushes, etc.

Industrial: Mechanical handling and lifting equipment, machine slides, hydraulic cylinders, hydraulic motors, ski lifts, pneumatic equipment, medical equipment, textile machinery, agricultural equipment, scientific equipment, etc.

Microsection

Operating Performance	
Dry	Good
Oil lubricated	Very Good
Grease lubricated	Very Good
Water lubricated	Poor
Process fluid lubricated	Poor

For Superior Performance	
Water lubricated	HPM / HPF / DP4-B
Process fluid lubricated	DP4 / GAR-FIL / HI-EX

DS™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	110 45
Operating temperature	Min Max	°C °C	- 60 130
Dry			
Maximum sliding speed, U		m/s	1,5
Maximum pU factor		N/mm² x m/s	1,4
Coefficient of friction f			0,15 - 0,3
Grease Lubricated			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm² x m/s	2,8
Coefficient of friction f			0,05 - 0,1
Oil Lubricated			
Maximum sliding speed, U		m/s	10,0*
Maximum pU factor		N/mm² x m/s	10,0*
Coefficient of friction f			0,03 - 0,08
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,4
Shaft surface hardness	Normal For longer service life	HB	> 200 > 350

* Depending on operating conditions

EP® Bearing Material

STRUCTURE

Thermoplastic Bearing Compound

CHARACTERISTICS

- Good bearing performance in dry working conditions
- Good bearing performance in lubricated or marginally lubricated applications
- Corrosion resistant in humid/saline environments
- Very good price performance ratio
- Very good weight performance ratio
- Within injection moulding tool feasibility unlimited dimensions and design features
- Compliant to EVL, WEEE and RoHS specifications

AVAILABILITY

Bearing forms available in standard dimensions

- Plain cylindrical bushes
- Plain flanged bushes

Bearing forms made to order: Standard forms in special dimensions, thrust washers, half-bearings, sliding plates, customized bearing designs

APPLICATIONS

General: Generally applicable within the limits of the material properties

Industrial: Medical equipment, awnings and blinds, scientific equipment, gaming equipment, office equipment, etc.

Microsection

Operating Performance	
Dry	Good
Oil lubricated	Good
Grease lubricated	Good
Water lubricated	Fair
Process fluid lubricated	Good after resistance testing

For Superior Performance	
Water lubricated	EP22

EP® Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	80 40
Operating temperature	Min Max	°C °C	- 40 140
Coefficient of linear thermal expansion		$10^{-6}/K$	22
Dry			
Maximum sliding speed, U		m/s	1,0
Maximum pU factor	for A_H/A_C = 5 for A_H/A_C = 10 for A_H/A_C = 20	N/mm^2 x m/s N/mm^2 x m/s N/mm^2 x m/s	0,06 0,24 1,00
Coefficient of friction f			0,15 - 0,3
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,8
Surface hardness		HV	> 200

EP®12 Bearing Material

STRUCTURE

Thermoplastic Bearing Compound

CHARACTERISTICS

- Good bearing performance in dry working conditions
- Good bearing performance in lubricated or marginally lubricated applications
- Corrosion resistant in humid/saline environments
- Very good price performance ratio
- Very good weight performance ratio
- Within injection moulding tool feasibility unlimited dimensions and design features
- Compliant to EVL, WEEE and RoHS specifications

AVAILABILITY

Bearing forms made to order: Cylindrical bushes, flanged bearings, thrust washers, sliding plates, half-bearings, customized bearing designs

APPLICATIONS

General: Generally applicable within the limits of the material properties

Industrial: Domestic appliances, furniture, office equipment, sports equipment and many more

Microsection

Operating Performance	
Dry	Very Good
Oil lubricated	Good
Grease lubricated	Good
Water lubricated	Fair
Process fluid lubricated	Good after resistance testing

For Superior Performance	
Water lubricated	EP22

EP®12 Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static	N/mm²	65
Operating temperature	Min Max	°C °C	- 40 125
Coefficient of linear thermal expansion		10^{-6}/K	120
Dry			
Maximum sliding speed, U		m/s	1,0
Maximum pU factor	for A_H/A_C = 5 for A_H/A_C = 10 for A_H/A_C = 20	N/mm² x m/s N/mm² x m/s N/mm² x m/s	0,04 0,09 0,18
Coefficient of friction f			0,18 - 0,3
Recommendations			
Shaft surface roughness, Ra		µm	0,1 - 0,5
Surface hardness		HV	> 200

EP®22 Bearing Material

STRUCTURE

Thermoplastic Bearing Compound

CHARACTERISTICS

- Good bearing performance in dry working conditions
- Very good bearing performance in lubricated or marginally lubricated applications
- Corrosion resistant in humid/saline environments
- Very good price performance ratio
- Very good weight performance ratio
- Within injection moulding tool feasibility unlimited dimensions and design features
- Compliant to EVL, WEEE and RoHS specifications

AVAILABILITY

Bearing forms available in standard dimensions

- Plain cylindrical bushes
- Plain flanged bushes

Bearing forms made to order: Standard forms in special dimensions, thrust washers, half-bearings, sliding plates, customized bearing designs

APPLICATIONS

General: Generally applicable within the limits of the material properties

Industrial: Domestic appliances, chemical equipment, office equipment, sports equipment and many more

Microsection

Operating Performance	
Dry	Very Good
Oil lubricated	Good
Grease lubricated	Good
Water lubricated	Very Good
Process fluid lubricated	Good after resistance testing

EP®22 Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static	N/mm²	50
Operating temperature	Min Max	°C °C	- 50 170
Coefficient of linear thermal expansion		10^{-6}/K	90
Dry			
Maximum sliding speed, U		m/s	1,0
Maximum pU factor	for A_H/A_C = 5 for A_H/A_C = 10 for A_H/A_C = 20	N/mm² x m/s N/mm² x m/s N/mm² x m/s	0,05 0,10 0,20
Coefficient of friction f			0,22 - 0,37
Recommendations			
Shaft surface roughness, Ra		µm	0,1 - 0,5
Surface hardness		HV	> 200

EP®43 Bearing Material

STRUCTURE

Thermoplastic Bearing Compound

CHARACTERISTICS

- Good bearing performance in dry working conditions
- Good bearing performance in lubricated or marginally lubricated applications
- Corrosion resistant in humid/saline environments
- Very good price performance ratio for high temperature applications
- Very good weight performance ratio
- Within injection moulding tool feasibility unlimited dimensions and design features
- Compliant to EVL, WEEE and RoHS specifications

AVAILABILITY

Bearing forms available in standard dimensions

- Plain cylindrical bushes
- Plain flanged bushes

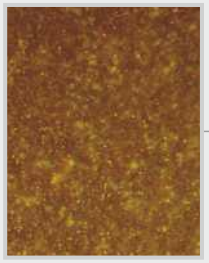
Bearing forms made to order: Standard forms in special dimensions, thrust washers, half-bearings, sliding plates, customized bearing designs

APPLICATIONS

General: Generally applicable within the limits of the material properties

Industrial: Domestic appliances, materials handling equipment, apparatus engineering, slot machines and cash boxes and many more

Microsection



Operating Performance	
Dry	Very Good
Oil lubricated	Good
Grease lubricated	Good
Water lubricated	Very Good
Process fluid lubricated	Good after resistance testing

EP®43 Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static	N/mm²	83
Operating temperature	Min Max	°C °C	- 40 240
Coefficient of linear thermal expansion		10^{-6}/K	45
Dry			
Maximum sliding speed, U		m/s	1,0
Maximum pU factor	for A_H/A_C = 5 for A_H/A_C = 10 for A_H/A_C = 20	N/mm² x m/s N/mm² x m/s N/mm² x m/s	0,22 0,90 3,59
Coefficient of friction f			0,11 - 0,2
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,8
Surface hardness		HV	> 200

EP®44 Bearing Material

STRUCTURE

Thermoplastic Bearing Compound

CHARACTERISTICS

- Good bearing performance in dry working conditions
- Good bearing performance in lubricated or marginally lubricated applications
- Corrosion resistant in humid/saline environments
- Very good price performance ratio for high temperature applications
- Very good weight performance ratio
- Within injection moulding tool feasibility unlimited dimensions and design features
- Compliant to EVL, WEEE and RoHS specifications

AVAILABILITY

Bearing forms made to order: Cylindrical bushes, thrust washers, sliding plates, half-bearings, special shapes obtained by stamping, bearings with locating notches, lubricant holes and machined grooves, customized bearing designs

APPLICATIONS

General: Generally applicable within the limits of the material properties

Industrial: Domestic appliances, valve technology, electronics assembly, apparatus engineering and many more

Microsection

PPS + Solid Lubricant + Fillers

Operating Performance	
Dry	Good
Oil lubricated	Very Good
Grease lubricated	Very Good
Water lubricated	Very Good
Process fluid lubricated	Good after resistance testing

EP®44 Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static	N/mm²	95
Operating temperature	Min Max	°C °C	- 40 240
Coefficient of linear thermal expansion		10^{-6}/K	27
Dry			
Maximum sliding speed, U		m/s	1,0
Maximum pU factor	for A_H/A_C = 5 for A_H/A_C = 10 for A_H/A_C = 20	N/mm² x m/s N/mm² x m/s N/mm² x m/s	0,11 0,42 1,69
Coefficient of friction f			0,16 - 0,26
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,8
Surface hardness		HV	> 450

EP®63 Bearing Material

STRUCTURE

Thermoplastic Bearing Compound

CHARACTERISTICS

- Good bearing performance in dry working conditions
- Good bearing performance in lubricated or marginally lubricated applications
- Corrosion resistant in humid/saline environments
- Suitable for very high temperature applications
- Very good weight performance ratio
- Within injection moulding tool feasibility unlimited dimensions and design features
- Compliant to EVL, WEEE and RoHS specifications

AVAILABILITY

Bearing forms available in standard dimensions

- Plain cylindrical bushes
- Plain flanged bushes

Bearing forms made to order: Standard forms in special dimensions, thrust washers, half-bearings, sliding plates, customized bearing designs

APPLICATIONS

General: Generally applicable within the limits of the material properties

Industrial: Domestic appliances, valve technology, electronics assembly, agricultural machinery and many more

Microsection

PEEK + Solid Lubricant + Fillers

Operating Performance	
Dry	Good
Oil lubricated	Good
Grease lubricated	Good
Water lubricated	Fair
Process fluid lubricated	Good after resistance testing

For Superior Performance	
Water lubricated	EP64

EP®63 Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static	N/mm²	90
Operating temperature	Min Max	°C °C	- 100 290
Coefficient of linear thermal expansion		10^{-6}/K	50
Dry			
Maximum sliding speed, U		m/s	1,0
Maximum pU factor	for A_H/A_C = 5 for A_H/A_C = 10 for A_H/A_C = 20	N/mm² x m/s N/mm² x m/s N/mm² x m/s	0,16 0,66 2,63
Coefficient of friction f			0,12 - 0,21
Recommendations			
Shaft surface roughness, Ra		µm	0,1 - 0,5
Surface hardness		HV	> 200

EP®64 Bearing Material

AVAILABILITY

Bearing forms made to order: Cylindrical bushes, flanged bearings, thrust washers, sliding plates, half-bearings, customized bearing designs

APPLICATIONS

General: Generally applicable within the limits of the material properties

Industrial: Domestic appliances, transportation equipment, apparatus engineering, conveyor equipment and many more

STRUCTURE

Thermoplastic Bearing Compound

CHARACTERISTICS

- Good bearing performance in lubricated or marginally lubricated applications
- Excellent flow erosion and cavitation resistance
- Corrosion resistant in humid/saline environments
- Suitable for very high temperature applications
- Very good weight performance ratio
- Within injection moulding tool feasibility unlimited dimensions and design features
- Compliant to EVL, WEEE and RoHS specifications

Microsection

PEEK + Solid Lubricant + Fillers

Operating Performance	
Dry	Good
Oil lubricated	Very Good
Grease lubricated	Very Good
Water lubricated	Good
Process fluid lubricated	Good after resistance testing

EP®64 Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static	N/mm²	125
Operating temperature	Min Max	°C °C	- 100 290
Coefficient of linear thermal expansion		10^{-6}/K	14
Dry			
Maximum sliding speed, U		m/s	1,0
Maximum pU factor	for A_H/A_C = 5 for A_H/A_C = 10 for A_H/A_C = 20	N/mm² x m/s N/mm² x m/s N/mm² x m/s	0,09 0,35 1,40
Coefficient of friction f			0,3 - 0,5
Recommendations			
Shaft surface roughness, Ra		µm	0,1 - 0,5
Surface hardness		HV	> 450

EP®73 Bearing Material

STRUCTURE

Thermoplastic Bearing Compound

CHARACTERISTICS

- Good bearing performance in dry working conditions
- Good bearing performance in lubricated or marginally lubricated applications
- Corrosion resistant in humid/saline environments
- Very good dimensional stability
- Very good weight performance ratio
- Within injection moulding tool feasibility unlimited dimensions and design features
- Compliant to EVL, WEEE and RoHS specifications

AVAILABILITY

Bearing forms made to order: Cylindrical bushes, flanged bearings, thrust washers, sliding plates, half-bearings, customized bearing designs

APPLICATIONS

General: Generally applicable within the limits of the material properties

Automotive: Automatic gears, pumps, sealing in turbo compressors, piston rings, valve seats, sealings

Industrial: Continuous furnaces, drying furnaces for coating, textile machines and many more

Other: Aerospace: Weight saving by replacement of aluminum or metal alloys, while providing superior stability and viscosity. Applicable in extreme high and low temperatures e.g. turbojet engine compressor blade

Microsection

PAI + Solid Lubricant + Fillers

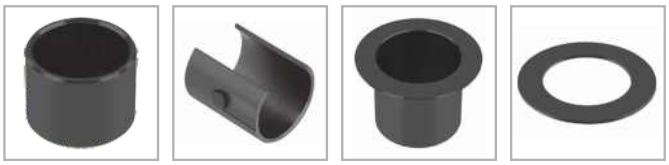
Operating Performance	
Dry	Good
Oil lubricated	Good
Grease lubricated	Good
Water lubricated	Fair
Process fluid lubricated	Good after resistance testing

For Superior Performance	
Water lubricated	EP64

EP®73 Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static	N/mm²	105
Operating temperature	Min Max	°C °C	- 200 260
Coefficient of linear thermal expansion		10^{-6}/K	25
Dry			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor	for A_H/A_C = 5 for A_H/A_C = 10 for A_H/A_C = 20	N/mm² x m/s N/mm² x m/s N/mm² x m/s	0,10 0,39 1,57
Coefficient of friction f			0,19 - 0,31
Lubricated			
Maximum sliding speed, U		m/s	5,0
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,8
Surface hardness		HV	> 200

EP®79 Bearing Material



STRUCTURE

Thermoplastic Bearing Compound

CHARACTERISTICS

- Excellent flow erosion and cavitation resistance
- Excellent performance in fully lubricated applications
- Corrosion resistant in humid/saline environments
- Excellent dimensional stability
- Very good weight performance ratio
- Within injection moulding tool feasibility unlimited dimensions and design features
- Compliant to EVL, WEEE and RoHS specifications

AVAILABILITY

Bearing forms made to order: Cylindrical bushes, flanged bearings, thrust washers, sliding plates, half-bearings, customized bearing designs

APPLICATIONS

General: Generally applicable within the limits of the material properties

Automotive: Automatic gears

Industrial: Domestic appliances, control valves, fittings, textile machines and many more

Microsection

Operating Performance	
Dry	Not recommended
Oil lubricated	Very Good
Grease lubricated	Very Good
Water lubricated	Fair
Process fluid lubricated	Good after resistance testing

For Superior Performance	
Dry	EP73
Water lubricated	EP64

EP®79 Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static	N/mm²	130
Operating temperature	Min Max	°C °C	- 200 260
Coefficient of linear thermal expansion		10^{-6}/K	9
Lubricated			
Maximum sliding speed, U		m/s	10,0
Maximum pU factor		N/mm² x m/s	10,0
Coefficient of friction f			0,005 - 0,1
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,8
Surface hardness		HV	> 500

KA™ Glacetal Bearing Material

STRUCTURE

Thermoplastic Bearing Compound

CHARACTERISTICS

- Good bearing performance in light duty working conditions
- Good performance in lubricated or marginally lubricated applications
- Corrosion resistant in humid/saline environments
- Very good price performance ratio
- Very good weight performance ratio

AVAILABILITY

Bearing forms available in standard dimensions

- Plain thrust washers

Non standard parts made to order

APPLICATIONS

Industrial: Thrust washers are used as axial bearings in conjunction with all cylindrical bushes according to ISO 3547 to prevent metal-to-metal contact and fretting damage

Microsection

Operating Performance	
Dry	Fair
Oil lubricated	Good
Grease lubricated	Good
Water lubricated	Fair
Process fluid lubricated	Fair

For Superior Performance	
Dry	EP22
Water lubricated	EP22
Process fluid lubricated	EP22

KA™ Glacetal Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	20 10
Operating temperature	Min Max	°C °C	- 40 80
Greased			
Maximum sliding speed, U		m/s	1,5
Maximum pU factor		N/mm^2 x m/s	0,35
Coefficient of friction f			0,08 - 0,12
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,4
Shaft surface hardness	Normal For longer service life	HB	> 200 > 350

Multilube™ Bearing Material

STRUCTURE

Thermoplastic Bearing Compound

CHARACTERISTICS

- Good bearing performance in dry working conditions
- Good performance in lubricated or marginally lubricated applications
- Corrosion resistant in humid/saline environments
- Good price performance ratio
- Very good weight performance ratio
- Within injection moulding tool feasibility unlimited dimensions and design features

AVAILABILITY

Bearing forms made to order: Cylindrical bushings, flanged bearings, thrust washers, sliding plates, half-bearings, customized bearing designs

APPLICATIONS

Industrial: Linkages, seat suspensions

Microsection

Operating Performance	
Dry	Good
Oil lubricated	Good
Grease lubricated	Good
Water lubricated	Fair
Process fluid lubricated	Fair

For Superior Performance	
Water lubricated	EP22
Process fluid lubricated	EP22

Multilube™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static	N/mm²	60
	Dynamic	N/mm²	30
Operating temperature	Min	°C	- 40
	Max	°C	80
	Momentary	°C	120
Coefficient of linear thermal expansion		10^{-6}/K	101
Dry			
Maximum sliding speed, U		m/s	1,5
Maximum pU factor		N/mm² x m/s	0,6
Coefficient of friction f			0,1 - 0,2
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,8
Shaft surface hardness	Normal	HB	> 200
	For longer service life		> 350

GAR-MAX® Bearing Material

STRUCTURE

Filament Wound Composite Material

CHARACTERISTICS

- High load capacity
- Excellent shock and misalignment resistance
- Excellent contamination resistance
- Very good friction and wear properties
- Good chemical resistance

AVAILABILITY

Bearing forms available in standard dimensions

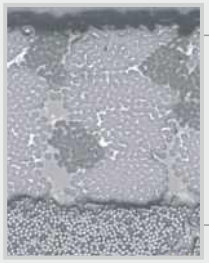
- Plain cylindrical bushes

Non-standard parts made to order: Cylindrical bushes with non-standard lengths and wall thickness, customized bushing designs

APPLICATIONS

Industrial: Steering linkages, hydraulic cylinder pivots, king pin bearings, boom lifts, scissor lifts, cranes, hoists, lift gates, backhoes, trenchers, skid steer loaders, front end loaders, etc.

Microsection



Operating Performance	
Dry	Very Good
Oil lubricated	Fair
Grease lubricated	Fair
Water lubricated	Fair
Process fluid lubricated	Poor

For Superior Performance	
Oil lubricated	GAR-FIL
Grease lubricated	DX / DX10
Water lubricated	HPF / HPM
Process fluid lubricated	GAR-FIL

GAR-MAX® Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	210 140
Operating temperature	Min Max	°C °C	- 195 160
Dry			
Maximum sliding speed, U		m/s	0,13
Maximum pU factor		N/mm² x m/s	1,05
Coefficient of friction f			0,05 - 0,3*
Recommendations			
Shaft surface roughness, Ra		µm	0,15 - 0,4
Shaft surface hardness	Normal For longer service life	HB	> 350 > 480

* Depending on operating conditions

GAR-FIL™ Bearing Material

STRUCTURE

Filament Wound Composite Material with Proprietary filled PTFE Tape Liner

CHARACTERISTICS

- High load capacity
- Good chemical resistance
- Machinable bearing surface
- High rotational speed capacity
- Very good friction and wear properties
- Excellent contamination resistance

AVAILABILITY

Bearing forms available in standard dimensions

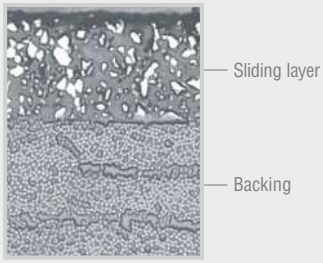
- Plain cylindrical bushes

Non-standard parts made to order: Cylindrical bushes with non-standard dimensions, customized bearing designs

APPLICATIONS

Industrial: Valves, scissor lifts, pulleys, toggle linkages, etc.

Microsection



Operating Performance	
Dry	Very Good
Oil lubricated	Very Good
Grease lubricated	Fair
Water lubricated	Fair
Process fluid lubricated	Very Good

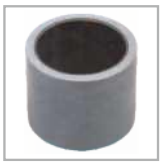
For Superior Performance	
Grease lubricated	DX / DX10
Water lubricated	HPF / HPM

GAR-FIL™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	140 140
Operating temperature	Min Max	°C °C	- 195 205
Dry			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm² x m/s	1,23
Coefficient of friction f			0,02 - 0,12*
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,4
Shaft surface hardness		HB	> 200

* Depending on operating conditions

HSG™ Bearing Material



STRUCTURE

Filament Wound Composite Material

CHARACTERISTICS

- High load capacity (twice as much as standard GAR-MAX® bearings)
- Excellent shock and misalignment resistance
- Excellent contamination resistance
- Very good friction and wear properties
- Good chemical resistance

AVAILABILITY

Bearing forms available in standard dimensions

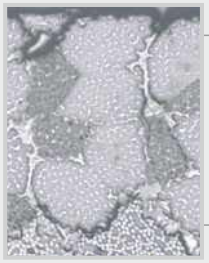
- Plain cylindrical bushes

Non-standard parts made to order: Cylindrical bushes with non-standard lengths and wall thickness, flanged bearings, hexagonal and square bores, liner on outer diameter, customized bearing designs

APPLICATIONS

Industrial: Steering linkages, hydraulic cylinder pivots, king pin bearings, boom lifts, scissor lifts, cranes, hoists, lift gates, backhoes, trenchers, skid steer loaders, front end loaders, etc.

Microsection



Operating Performance	
Dry	Very Good
Oil lubricated	Fair
Grease lubricated	Fair
Water lubricated	Fair
Process fluid lubricated	Fair

For Superior Performance	
Oil lubricated	GAR-FIL
Grease lubricated	DX / DX10
Water lubricated	HPF / HPM
Process fluid lubricated	GAR-FIL

HSG™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	415 140
Operating temperature	Min Max	°C °C	- 195 160
Dry			
Maximum sliding speed, U		m/s	0,13
Maximum pU factor		N/mm² x m/s	1,05
Coefficient of friction f			0,05 - 0,3*
Recommendations			
Shaft surface roughness, Ra		µm	0,15 - 0,4
Shaft surface hardness	Normal For longer service life	HB	> 350 > 480

* Depending on operating conditions

MLG™ Bearing Material

STRUCTURE

Filament Wound Composite Material

CHARACTERISTICS

- Value engineered filament wound bearing for lighter duty applications
- High load capacity
- Good misaligment resistance
- Excellent shock resistance
- Good friction and wear properties
- Good chemical resistance

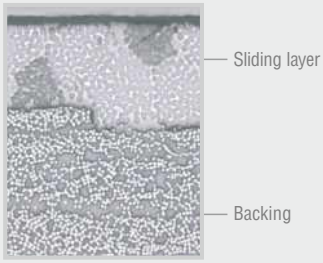
AVAILABILITY

Bearing forms made to order: Cylindrical bushes, customized bearing design

APPLICATIONS

Industrial: Construction and earth moving equipment, conveyors, cranes, hoists, hydraulic cylinder pivots, etc.

Microsection



Operating Performance	
Dry	Very Good
Oil lubricated	Good
Grease lubricated	Poor
Water lubricated	Fair
Process fluid lubricated	Fair

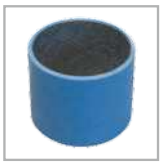
For Superior Performance	
Grease lubricated	DX / DX10
Water lubricated	HPF / HPM
Process fluid lubricated	GAR-FIL

MLG™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	210 140
Operating temperature	Min Max	°C °C	- 195 160
Dry			
Maximum sliding speed, U		m/s	0,13
Maximum pU factor		N/mm² x m/s	1,05
Coefficient of friction f			0,05 - 0,3*
Recommendations			
Shaft surface roughness, Ra		µm	0,15 - 0,4
Shaft surface hardness		HB	> 350

* Depending on operating conditions

HPMB® Bearing Material NEW



STRUCTURE

Fiber and Epoxy Resin Composite Material

CHARACTERISTICS

- Machinable inner and outer diameters for superior application precision, circularity and cylindricity tolerances
- Pre-machined high precision HPMB bearings available for immediate installation
- High precision through easy single point machining of the bearing liner, on-site prior to installation
- Superior precision achieved with post-installation (inner diameter tolerance IT7 attainable) single point machining of the bearing liner
- High load capacity
- Excellent shock and edge loading capacity
- Low friction with negligible stick-slip
- Low wear rate for extended bearing life
- Excellent corrosion resistance
- Dimensionally stable - very low water absorption, low swelling
- Environmentally friendly grease-free operation

AVAILABILITY

Bearing forms made to order: Finished cylindrical bushings, pre-machined cylindrical bushings, flanged cylindrical bushings (subject to design review)

APPLICATIONS

Industrial: Railroad stabilization system, railroad brake linkages, injection molding machines – guide bushings, hydraulic cylinder pivots, water turbines – wicket gates, servomotors, links, water gates, valves

Microsection

Operating Performance	
Dry	Very Good
Oil lubricated	Fair
Grease lubricated	Not recommended
Water lubricated	Very Good
Process fluid lubricated	To be tested by final user

For Superior Performance	
Oil lubricated	GAR-FIL / HPF
Grease lubricated	DX / DX10
Process fluid lubricated	GAR-FIL / HPF

HPMB® Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	210 140
Operating temperature	Min Max	°C °C	- 196 163
Coefficient of linear thermal expansion		$10^{-6}/K$	12,6
Dry			
Maximum sliding speed, U		m/s	0,13
Maximum pU factor		N/mm^2 x m/s	1,23
Coefficient of friction f			0,03 - 0,12*
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,8
Shaft surface hardness	Normal For longer service life	HB	> 180 > 480

* Depending on operating conditions

HPM™ Bearing Material

STRUCTURE

Filament Wound Composite Material

CHARACTERISTICS

- Designed for hydropower applications
- High load capacity
- Excellent shock and edge loading capacity
- Low friction, superior wear rate and bearing life
- Excellent corrosion resistance
- Dimensionally stable - very low water absorption, low swelling
- Environmentally friendly

AVAILABILITY

Bearing forms available in standard dimensions

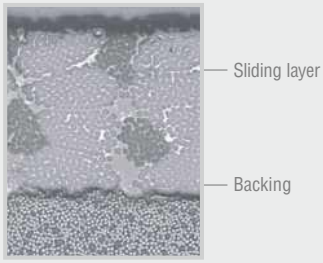
- Plain cylindrical bushes

Non-standard parts made to order: Cylindrical bushes with non-standard dimensions, customized bearing designs

APPLICATIONS

Industrial: Servo-motor bearings, operating ring sliding segments, linkage bearings, wicket gate bearings, guide vane bearings, intake gate sliding segments, intake gate roller bearings, spillway gate bearings, trash rate bearings, fish screen bearings, trunnion bearings, blade bearings, injector bearings, deflector bearings, ball and butterfly trunnion bearings, etc.

Microsection



Operating Performance	
Dry	Very Good
Oil lubricated	Fair
Grease lubricated	Poor
Water lubricated	Very Good
Process fluid lubricated	Poor

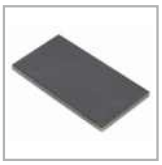
For Superior Performance	
Oil lubricated	GAR-FIL / HPF
Grease lubricated	DX / DX10
Process fluid lubricated	GAR-FIL / HPF

HPM™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	210 140
Operating temperature	Min Max	°C °C	- 195 160
Dry			
Maximum sliding speed, U		m/s	0,13
Maximum pU factor		N/mm² x m/s	1,23
Coefficient of friction f			0,03 - 0,12*
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,8
Shaft surface hardness	Normal For longer service life	HB	> 180 > 480

* Depending on operating conditions

HPF™ Bearing Material



STRUCTURE

Proprietary Filled PTFE Tape Liner with Fiberglass Backing

CHARACTERISTICS

- Designed for hydropower applications
- Machinable bearing surface
- High load capacity
- Excellent shock and edge loading capacity
- Low friction, superior wear rate and bearing life
- Excellent corrosion resistance
- Dimensionally stable - very low water absorption, low swelling
- Environmentally friendly

AVAILABILITY

Bearing forms available in standard dimensions

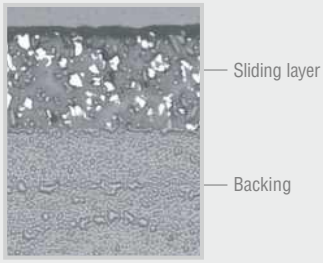
- Plain cylindrical bushes
- Sliding plates

Non-standard parts made to order: Cylindrical bushes with non-standard dimensions, customized bearing designs

APPLICATIONS

Industrial: Servo-motor bearings, operating ring sliding segments, linkage bearings, wicket gate bearings, guide vane bearings, intake gate sliding segments, intake gate roller bearings, spillway gate bearings, trash rate bearings, fish screen bearings, trunnion bearings, blade bearings, injector bearings, deflector bearings, ball and butterfly trunnion bearings, etc.

Microsection



Operating Performance	
Dry	Very Good
Oil lubricated	Very Good
Grease lubricated	Poor
Water lubricated	Very Good
Process fluid lubricated	Good

For Superior Performance	
Grease lubricated	DX / DX10

HPF™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	140 140
Operating temperature	Min Max	°C °C	- 195 140
Dry			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm^2 x m/s	1,23
Coefficient of friction f			0,02 - 0,1*
Greased Lubrication			
Coefficient of friction f			0,02 - 0,08*
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,8
Shaft surface hardness	Normal For longer service life	HB	> 180 > 480

* Depending on operating conditions

MEGALIFE XT Bearing Material

STRUCTURE

Double-Sided Proprietary Filled PTFE Tape Liner on Fiberglass Core

CHARACTERISTICS

- Excellent shock resistance
- High load capacity
- Excellent misalignment resistance
- Excellent contamination resistance
- Good surface speed capability
- Very good friction and wear properties
- Good chemical resistance

AVAILABILITY

Bearing forms available in standard dimensions

- Plain thrust washers

Bearing forms made to order: Thrust washers with non-standard dimensions, customized bearing designs

APPLICATIONS

Industrial: Pulley spacers, gear spacers, aerial lifts, fork lift masts, king pins, steering links, lift gates, cranes, backhoes, valve actuator linkages, etc.

Microsection

Operating Performance	
Dry	Very Good
Oil lubricated	Fair
Grease lubricated	Poor
Water lubricated	Very Good
Process fluid lubricated	Fair

For Superior Performance	
Oil lubricated	HPF
Grease lubricated	DX
Process fluid lubricated	HPF

MEGALIFE XT Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	140 140
Operating temperature	Min Max	°C °C	- 195 175
Dry			
Maximum sliding speed, U		m/s	0,5
Maximum pU factor		N/mm² x m/s	1,23
Coefficient of friction f			0,02 - 0,12*
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,4
Shaft surface hardness		HB	> 200

* Depending on operating conditions

Multifil™ Bearing Material

STRUCTURE

Proprietary Filled PTFE Tape

CHARACTERISTICS

- Superior sliding bearing material which can be easily bonded to any clean, rigid substrate
- Reduces vibration

AVAILABILITY

Bearing forms available in standard dimensions

- Sliding plates

Tape with 0.38 to 3.2 mm thickness and 305 mm width

APPLICATIONS

Industrial: Machine tool ways, gibs and other sliding applications

Microsection

Operating Performance	
Dry	Very Good
Oil lubricated	Very Good
Grease lubricated	Very Good
Water lubricated	Good
Process fluid lubricated	Good

Multifil™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	70 35
Operating temperature	Min Max	°C °C	- 200 280
Dry			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm² x m/s	0,32
Coefficient of friction f			0,07
Greased / Oil Lubrication			
Maximum pU factor		N/mm² x m/s	1,25
Coefficient of friction f			0,05
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,4
Shaft surface hardness		HB	> 200

SBC™ with GAR-MAX® Bearing Material

STRUCTURE

Sealed Filament Wound Composite Material

CHARACTERISTICS

- Self-lubricating
- High static load capacity
- Excellent resistance to shock loading and misalignment
- Very good friction and wear properties
- Good chemical resistance
- Sealed to exclude contaminates to offer extended service life
- Environmentally friendly and eliminates need for automated grease system and grease

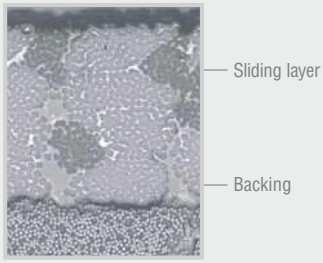
AVAILABILITY

Bearing forms made to order: GGB SBC™ with GAR-MAX® sealed assemblies with or without steel outer shell, customized bearing designs

APPLICATIONS

Industrial: Steering linkages, hydraulic cylinder pivots, king pin bearings, boom lifts, scissor lifts, cranes, hoists, lift gates, backhoes, trenchers, skid steer loaders, front end loaders, etc.

Microsection



Operating Performance	
Dry	Very Good
Oil lubricated	Fair
Grease lubricated	Fair
Water lubricated	Fair
Process fluid lubricated	Fair

SBC™ with GAR-MAX® Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	210 140
Operating temperature	Continuous Intermittent	°C °C	93 104
Dry			
Maximum sliding speed, U		m/s	0,13
Maximum pU factor		N/mm² x m/s	1,05
Recommendations			
Shaft surface roughness, Ra		µm	0,15 - 0,4
Shaft surface hardness	Normal For longer service life	HB	> 350 > 480

* Depending on operating conditions

SBC™ with HSG™ Bearing Material

STRUCTURE

Sealed Filament Wound Composite Material

CHARACTERISTICS

- Self-lubricating
- High static load capacity
- Excellent resistance to shock loading and misalignment
- Very good friction and wear properties
- Good chemical resistance
- Sealed to exclude contaminates to offer extended service life
- Environmentally friendly and eliminates need for automated grease system and grease

AVAILABILITY

Bearing forms made to order: GGB SBC™ with HSG™ sealed assemblies with or without steel outer shell, customized bearing designs

APPLICATIONS

Industrial: Steering linkages, hydraulic cylinder pivots, king pin bearings, boom lifts, scissor lifts, cranes, hoists, lift gates, backhoes, trenchers, skid steer loaders, front end loaders, etc.

Operating Performance	
Dry	Very Good
Oil lubricated	Fair
Grease lubricated	Fair
Water lubricated	Fair
Process fluid lubricated	Fair

SBC™ with HSG™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	415 140
Operating temperature	Continuous Intermittent	°C °C	93 104
Dry			
Maximum sliding speed, U		m/s	0,13
Maximum pU factor		N/mm² x m/s	1,05
Recommendations			
Shaft surface roughness, Ra		µm	0,15 - 0,4
Shaft surface hardness	Normal For longer service life	HB	> 350 > 480

* Depending on operating conditions

SICAL®3 / SICAL®3D Bearing Material

STRUCTURE

High Strength Aluminum Alloy with Anti-Friction and Wear Resistance Properties

CHARACTERISTICS

- Suitable for use with oil lubrication
- High load capacity
- Good fatigue and wear resistance
- High mechanical strength
- Good friction
- Excellent machinability

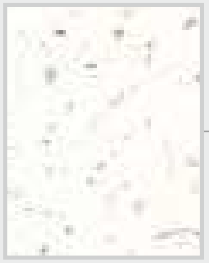
AVAILABILITY

Bearing forms made to order: High performance engineered solutions and designs with or without assembled bearings according to customers' requirements

APPLICATIONS

Industrial & Automotive: Hydraulic external gear pumps and motors

Microsection



Operating Performance	
Dry	Not recommended
Oil lubricated	Very Good
Grease lubricated	Not recommended
Water lubricated	Fair
Process fluid lubricated	Not recommended

ggbearings.com/en/products/bushing-blocks-and-thrust-plates/sical-3
ggbearings.com/en/products/bushing-blocks-and-thrust-plates/sical-3d

PICAL®2 / PICAL®3 Bearing Material

STRUCTURE

High Strength Aluminum Alloy with Wear Resistance Properties

CHARACTERISTICS

- Suitable for use with oil lubrication
- High load capacity
- High mechanical strength
- Good friction
- Excellent machinability

AVAILABILITY

Bearing forms made to order: High performance engineered solutions and designs with or without assembled bearings according to customers' requirements

APPLICATIONS

Industrial & Automotive: Hydraulic external gear pumps and motors

Microsection

Operating Performance	
Dry	Not recommended
Oil lubricated	Very Good
Grease lubricated	Not recommended
Water lubricated	Fair
Process fluid lubricated	Not recommended

ggbearings.com/en/products/bushing-blocks-and-thrust-plates/pical-2
ggbearings.com/en/products/bushing-blocks-and-thrust-plates/pical-3

GGB-CSM® Bearing Material



STRUCTURE

Monometallic Bearing produced by Metallurgic Powder Process

CHARACTERISTICS

- Self-lubricating and maintenance-free with homogeneously distributed solid lubricant (graphite, MoS_2) in the metallic matrix
- High load capacity and temperature ranges up to 600°C possible depending on the alloy
- Corrosion resistant alloys are available
- Lead-free alloys are available

AVAILABILITY

Bearing forms made to order: Cylindrical bushes, flanged bushes, thrust washers, sliding plates, half-bearings, axial and radial segment rings, self-aligning spherical bearings, special shapes, customized bearing designs

APPLICATIONS

Industrial: General mechanical engineering, applications with elevated temperatures and corrosion risk, exhaust or smoke flaps, valves, turbines, iron foundry, steel and aluminum industry, furnaces, blower, steel works and civil engineering, turbines (water, steam and gas), pumps and compressors, sewage purification plants, thermal treatment furnaces, hot rolling mills, food and beverage industry, packaging equipment, agriculture and construction machines, handling equipment, tire molds, etc.

Microsection

Operating Performance	
Dry	Good
Oil lubricated	Good
Grease lubricated	Good
Water lubricated	Depending on Alloy
Process fluid lubricated	Depending on Fluid or Alloy

GGB-CSM® Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	100 - 260 55 - 130
Operating temperature	Min Max	°C °C	- 200 600
Coefficient of linear thermal expansion		10^{-6}/K	13 - 18
Dry			
Maximum sliding speed, U		m/s	0,2 - 0,5
Maximum pU factor		N/mm² x m/s	0,8 - 1,5
Coefficient of friction f			0,11 - 0,5
Water Lubricated			
Coefficient of friction f			0,08 - 0,18
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,8
Shaft surface hardness		HB HRC	> 180 > 45

Bearing properties and recommendations depending on GGB-CSM material grade

GGB-CBM® Bearing Material



STRUCTURE

Thin Walled Bimetal Bearing produced by Metallurgic Powder Process

CHARACTERISTICS

- Self-lubricating and maintenance-free with homogeneously distributed solid lubricant (graphite) in the sliding layer
- High load capacity and suited to temperatures from -150°C up to 280°C
- Different metallic backings are available: stainless steel, carbon steel or bronze
- Lead-free alloys are available

AVAILABILITY

Bearing forms made to order: Cylindrical bushes, flanged bushes, thrust washers, axial washers, sliding plates, half shells, axial and radial segment rings, spherical bushings, customized bearing designs

APPLICATIONS

Industrial: General mechanical engineering, applications at high loads, iron foundry, steel and aluminum industry, furnaces, blower, steel works, food and beverage industry, packaging equipment, agriculture and construction machines, handling equipment, tire molds, etc.

Microsection

Operating Performance	
Dry	Good
Oil lubricated	Good
Grease lubricated	Good
Water lubricated	Good
Process fluid lubricated	Depending on Fluid

GGB-CBM® Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	260 - 280 80 - 150
Operating temperature	Min Max	°C °C	- 150 280
Coefficient of linear thermal expansion		10^{-6}/K	12 - 16
Dry			
Maximum sliding speed, U		m/s	0,3 - 0,5
Maximum pU factor		N/mm² x m/s	0,5 - 1,0
Coefficient of friction f			0,10 - 0,2
Water Lubricated			
Coefficient of friction f			0,10 - 0,15
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,8
Shaft surface hardness		HB	> 180 - > 250

Bearing properties and recommendations depending on GGB-CBM material grade

GGB-BP25 Bearing Material

STRUCTURE

Bronze Sinter Impregnated with Oil,
Similar to SINT A 50, Impregnation Group 1

CHARACTERISTICS

- Maintenance-free bearing for general engineering applications
- Optimum performance under relatively light loads and high speeds
- Produced by powder metallurgy process and therefore suitable for complex shapes

AVAILABILITY

Bearing forms available in standard dimensions

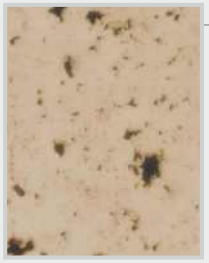
- Plain cylindrical bushes
- Plain flanged bushes

Bearing forms made to order: Cylindrical bushes and flanged bushes with non-standard dimensions, spherical bearings, tubes and rod blanks, customized bearing designs

APPLICATIONS

Industrial: FHP motor bearings, domestic appliances and hand tools

Microsection



BP25 with composition:

Sn 8 – 10.5 %

Other < 2 %

Cu Rest

Impregnation group 1 (up to 80°C)

Operating Performance	
Dry	Good (PTFE/MoS_2)
Oil lubricated	Good
Grease lubricated	Fair
Water lubricated	Not recommended
Process fluid lubricated	Not recommended

GGB-BP25 Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	20 10
Operating temperature	Min Max	°C °C	- 180 / 0* 90 / 300*
Minimum Density		g/cm³	6,2
Minimum Apparent Porosity		%	23
Oil Impregnated			
Maximum sliding speed, U		m/s	0,1 - 6,0*
Maximum pU factor		N/mm² x m/s	0,1 - 1,8*
Coefficient of friction f			0,05 - 0,25*
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,3 - 0,6*
Shaft surface hardness		HB	> 240 - > 355*

* Bearing properties depending on oil or solid lubricants

GGB-FP20 Bearing Material

STRUCTURE

Steel Alloy Sinter Impregnated with Oil, Similar to SINT A 50, Impregnation Group 1

CHARACTERISTICS

- Maintenance-free bearing for general engineering applications
- Optimum performance under relatively light loads and high speeds
- Produced by powder metallurgy process and therefore suitable for complex shapes

AVAILABILITY

Bearing forms made to order: plain cylindrical bushes, plain flanged bushes, non standard parts

APPLICATIONS

Industrial: FHP motor bearings, domestic appliances and hand tools

Microsection

1 - 4% Cu
< 0.25% C
< 2% Other
Rest Fe
Impregnation
group 1
(up to 80°C)

Operating Performance	
Dry	Good (PTFE/MoS_2)
Oil lubricated	Good (Oil impregnated)
Grease lubricated	Not recommended
Water lubricated	Not recommended
Process fluid lubricated	Not recommended

GGB-FP20 Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	45 8,0 - 22,5
Operating temperature	Min Max	°C °C	- 180 / -5* 90 / 300*
Minimum Density		g/cm^3	5,6
Minimum Apparent Porosity		%	20
Oil Impregnated			
Maximum sliding speed, U		m/s	0,1 - 4,0*
Maximum pU factor		N/mm^2 x m/s	0,1 - 1,8*
Coefficient of friction f			0,05 - 0,25*
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,2 - 0,3*
Shaft surface hardness		HB	> 240 - > 355*

* Bearing properties depending on oil or solid lubricants

GGB-SO16 Bearing Material

STRUCTURE

Steel Alloy Sinter Impregnated with Oil

CHARACTERISTICS

- Maintenance-free bearing for general engineering applications
- Superior performance compared to GGB-FP20 under high loads and low speeds
- Produced by powder metallurgy process and therefore suitable for complex shapes

AVAILABILITY

Blanks are made to order

APPLICATIONS

Industrial: FHP motor bearings, domestic appliances and hand tools, heavy duty applications: construction equipment, railway equipment, military equipment

Microsection

20% Cu
0.3 - 0.6% C
<2% Other
Rest Fe

Operating Performance	
Dry	Not Applicable
Oil lubricated	Good (Oil impregnated)
Grease lubricated	Not recommended
Water lubricated	Not recommended
Process fluid lubricated	Not recommended

GGB-SO16 Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	120 60
Operating temperature	Min Max	°C °C	0 105
Minimum Density		g/cm^3	6
Minimum Apparent Porosity		%	16
Oil Impregnated			
Maximum sliding speed, U		m/s	0,3
Maximum pU factor		N/mm^2 x m/s	0,9
Coefficient of friction f			0,05 - 0,15*
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,2*
Shaft surface hardness		HB	> 355

* Bearing properties depending on oil or solid lubricants

GGB-SZ™ Bearing Material NEW

STRUCTURE

Bimetal Bearing with Steel Backing and Lead Free Bronze Overlay

CHARACTERISTICS

- Lead-free bearing composition with indents as reservoir for the grease, also available without indents
- High load capacity, very good resistance to fatigue strength at high temperatures
- Suited to harsh operating conditions
- Particularly suitable for high specific loads with oscillating motion and low frequency
- Fine turned shafts suitable

AVAILABILITY

Bearing forms made to order: Cylindrical bushes and sliding plates with non-standard dimensions, customized bearing designs

APPLICATIONS

Industrial: Agricultural machinery, earth-movers, textile machinery, king pin bushes, oil pump bearings, mechanical handling and lifting equipment, off highway equipment etc.

Microsection

Operating Performance	
Dry	Poor
Oil lubricated	Good
Grease lubricated	Very Good
Water lubricated	Poor
Process fluid lubricated	Poor

GGB-SZ™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	300 140
Operating temperature	Min Max greased Max oil lubricated	°C °C °C	- 40 150 250
Greased / Oil Lubricated			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm² x m/s	2,8
Coefficient of friction f	Greased Oil lubricated		0,05 - 0,12 0,04 - 0,12
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,8
Shaft surface hardness	Normal For longer service life	HB	> 200 > 350

* Depending on operating conditions

SY™ Bearing Material

STRUCTURE

Bimetal Bearing with Steel Backing and Leaded Bronze Overlay

CHARACTERISTICS

- Particularly suitable for high specific loads with oscillating motion and low frequency
- Applicable in rough operation conditions
- High load capacity, very good resistance to fatigue strength at higher temperatures

AVAILABILITY

Bearing forms available in standard dimensions

- Cylindrical bushes
- Thrust washers

Bearing forms made to order: Cylindrical bushes and thrust washers with non-standard dimensions, sliding plates, customized bearing designs

APPLICATIONS

Industrial: Mechanical handling and lifting equipment, hydraulic cylinders, agricultural equipment, off highway equipment etc.

Microsection

Operating Performance	
Dry	Poor
Oil lubricated	Good
Grease lubricated	Very Good
Water lubricated	Poor
Process fluid lubricated	Poor

SY™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	300 140
Operating temperature	Min Max greased Max oil lubricated	°C °C °C	- 40 150 250
Greased / Oil Lubricated			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm² x m/s	2,8
Coefficient of friction f	Greased Oil lubricated		0,05 - 0,12 0,04 - 0,12
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,8
Shaft surface hardness	Normal For longer service life	HB	> 200 > 350

* Depending on operating conditions

SP™ Bearing Material

STRUCTURE

Bimetal Bearing with Steel Backing and Leaded Bronze Overlay

CHARACTERISTICS

- For lubricated applications with plain sliding layer
- Suitable for oil and grease lubrication

AVAILABILITY

Bearing forms made to order: Cylindrical bushes, thrust washers, sliding plates, customized bearing designs

APPLICATIONS

Industrial: Mechanical handling and lifting equipment, machine slides, hydraulic cylinders, hydraulic motors, pneumatic equipment, medical equipment, textile machinery, agricultural equipment, etc.

Microsection

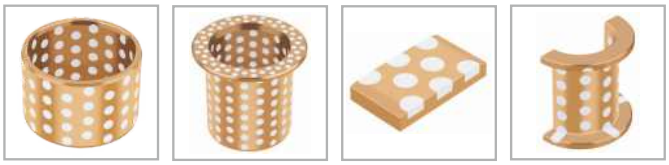
Operating Performance	
Dry	Poor
Oil lubricated	Good
Grease lubricated	Good
Water lubricated	Poor
Process fluid lubricated	Poor

SP™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	250 120
Operating temperature	Min Max greased Max oil lubricated	°C °C °C	- 40 150 250
Greased / Oil Lubricated			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm² x m/s	2,8
Coefficient of friction f	Greased Oil lubricated		0,05 - 0,12 0,04 - 0,12
Recommendations			
Shaft surface roughness, Ra		µm	≤ 0,4
Shaft surface hardness	Normal For longer service life	HB	> 200 > 350

* Depending on operating conditions

DB™ Bearing Material



AVAILABILITY

Bearing forms made to order: Cylindrical bushes, flanged bushes, thrust washers, sliding plates, pintle bearings, half-bearings, axial and radial segment rings, self-aligning spherical bearings, customized bearing designs

STRUCTURE

Monometallic Bearing made from Cast Bronze with Solid Lubricant Inserts

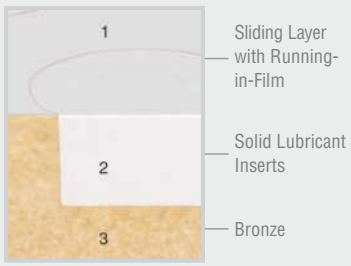
APPLICATIONS

Industrial: Offshore industry, underwater equipment, bridges and civil engineering, iron and steel industry equipment, cranes and conveyors, deep and open cast mining equipment, construction and earthmoving equipment, etc.

CHARACTERISTICS

- Maintenance-free bearing material for heavy duty applications
- Excellent performance under high loads and intermittent operation
- Also available with graphite inserts for temperatures above 250°C

Microsection



Operating Performance	
Dry	Good
Oil lubricated	Good
Grease lubricated	Good
Water lubricated	Good
Process fluid lubricated	Fair

DB™ Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm² N/mm²	200 100
Operating temperature	Min Max	°C °C	- 50 350
Dry			
Maximum sliding speed, U		m/s	0,5
Maximum pU factor		N/mm² x m/s	1,5
Coefficient of friction f			0,05 - 0,18
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,8
Shaft surface hardness		HB	> 200

Solid Bronze Bearing Material

STRUCTURE

Solid Bronze Alloy Bearings According to ISO 4379

CHARACTERISTICS

- Conventional bearing material for lubricated applications in general engineering applications
- Suitable for oil and grease lubrication

AVAILABILITY

Bearing forms made to order: Cylindrical bushes with bronze alloy according to ISO 4379, special parts according to ISO, DIN or customer design, special alloys

APPLICATIONS

Industrial: Mechanical handling and lifting equipment, general and special engineering, agricultural equipment, textile machinery, automotive engineering, etc.

Microsection

Operating Performance	
Dry	Not recommended
Oil lubricated	Good
Grease lubricated	Good
Water lubricated	Not recommended
Process fluid lubricated	Not recommended

Solid Bronze Technical Data

Bearing Properties		Units	Value
General			
Maximum load, p	Static Dynamic	N/mm^2 N/mm^2	200 100
Operating temperature	Min Max greased	°C °C	- 40 140
Grease Lubriated			
Maximum sliding speed, U		m/s	2,5
Maximum pU factor		N/mm^2 x m/s	2,8
Coefficient of friction f			0,09 - 0,15
Recommendations			
Shaft surface roughness, Ra		µm	0,2 - 0,8
Shaft surface hardness		HB	> 350

UNI™ Self-Aligning Bearing Housing

STRUCTURE

Housing Material: **GGG40**
Spherical Material: **16MnCr5**

CHARACTERISTICS

- Adjusting bearing for misalignment equalisation
- All-purpose as flange or pedestal bearing, suitable for high loads
- Self-aligning spheric avoids edge load to the bearing
- Adjustable up to ± 5°
- Spheric is secured against distortion
- Depending on choice of housing, spherics and bearings, simple to most demanding bearing solutions are possible
- For optimum design solutions, various bearings from the GGB product program are applicable

AVAILABILITY

Made to order

APPLICATIONS

Industrial: Wind energy plants, car washes, cleaning machines, drum systems, bevelling equipment, handling systems, conveyor belts (pulleys), printing machines, heating and ventilation equipment, hoists, cranes, textile machinery, special machine engineering, bakery equipment, marine equipment

UNI™ Technical Data

Load Limit Values for Radial Forces

Size	Bush ID	Max. Radial Load [N] (housing)	Max. Radial Load [N] (bolt)	Max. Shear Off Load [N] (bolt)
1	10 - 25	20 000	10 000	1 000
2	28 - 40	30 000	15 000	1 500
3	45 - 60	50 000	25 000	2 500
4	65 - 80	90 000	45 000	4 500
5	85 - 100	125 000	62 500	6 000

The given data for UNI bearing housings are valid for 12.9 screws (DIN EN 20898, part 1), since the housing stability exceeds the permissible load of the fixing screws.

MINI™ Self-Aligning Bearing Housing

STRUCTURE

Housing Material: **AlMgSi12**
Spherical Material: **9SMn28K**
Stainless and other materials available

CHARACTERISTICS

- Adjusting bearing for misalignment equalisation
- All-purpose as flange or pedestal bearing, suitable for high loads
- Self-aligning spheric avoids edge load to the bearing
- Adjustable up to ± 5°
- Spheric is secured against distortion
- Depending on choice of housing, spherics and bearings, simple to most demanding bearing solutions are possible
- For optimum design solutions, various bearings from the GGB product program are applicable

AVAILABILITY

Made to order

APPLICATIONS

Industrial: Wind energy plants, car washes, cleaning machines, drum systems, bevelling equipment, handling systems, conveyor belts (pulleys), printing machines, heating and ventilation equipment, hoists, cranes, textile machinery, special machine engineering, bakery equipment, marine equipment

MINI™ Technical Data

Load Limit Values for Radial Forces

Size	Bush ID	Max. Radial Load [N] (housing)	Max. Radial Load [N] (bolt)	Max. Shear Off Load [N] (bolt)
0	8 - 15	10 000	5 000	500

The permissible loads for MINI bearings housings are defined by the housing stability or the strength of the fixing screws (6mm diameter), depending on the load direction.

EXALIGN™ Self-Aligning Bearing Housing



STRUCTURE

Housing Material: **Cast Iron**
Spherical Material: **Cast Iron**

CHARACTERISTICS

- Adjusting bearing for misalignment equalisation
- All-purpose as flange (EXALIGN™ DF and FL) or pedestal bearing (EXALIGN™ PB), suitable for high loads
- Self-aligning spheric avoids edge load to the bearing
- Adjustable up to ± 5°
- Spheric is secured against distortion
- Depending on choice of housing, spherics and bearings, simple to most demanding bearing solutions are possible
- For optimum design solutions, various bearings from the GGB product program are applicable

AVAILABILITY

Made to order

APPLICATIONS

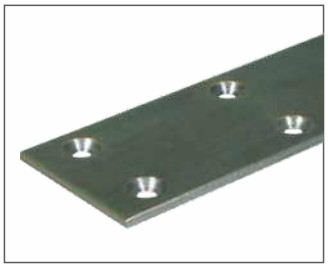
Industrial: Wind energy plants, car washes, cleaning machines, drum systems, bevelling equipment, handling systems, conveyor belts (pulleys), printing machines, heating and ventilation equipment, hoists, cranes, textile machinery, special machine engineering, bakery equipment, marine equipment

EXALIGN™ Technical Data

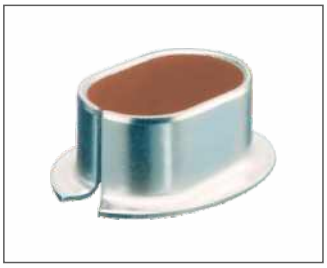
Load Limit Values for Radial Forces		Type PB 2-Hole Pedestal Bearing	Type FL/DF 4-Hole/2-Hole Flange Bearing
Size	Bush ID	Max. radial load (N)	Max. radial load (N)
1	10 - 15	4 250	3 750
2	20 - 25	7 700	5 900
3	30	9 500	8 000
4	35 - 40	17 000	11 000
5	45	23 000	12 000
6	50	25 000	14 500
7	55 - 60	30 000	16 000
8	70 - 75	38 000	17 000
9	80 - 85	45 500	27 000
10	90 - 100	74 500	30 500

EXALIGN™ is a product of Cryptic Avris Ltd., Leicester, UK

Special Parts Capabilities



Fully finished strip with countersinks

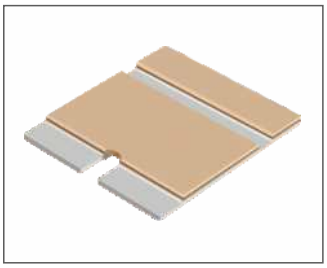


Slot bush with flange

FlashClick® double flange bearing

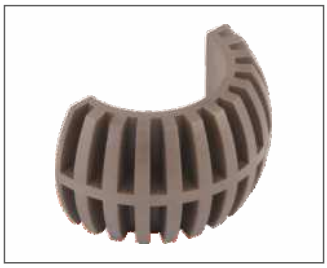
Gauge guide, deep-drawn, sliding layer outside

Ball half bearings



Special strips

Special half bearing



Special parts

In addition to our broad range of standard bearing solutions, GGB also has the capability to custom manufacture a variety of non-standard bearing configurations throughout our product range. Our materials and manufacturing engineers are available around the clock to work with our customers to identify and develop innovative solutions to their most demanding bearing challenges.

Non-standard configurations can be manufactured to any scale – even a single piece – using mono- and bimetallic, metal-polymer, solid polymer, filament wound and even turned parts.

We use a variety of techniques, including machining, stamping, water jet cutting, deep drawing and injection molding to meet our customers' requirements, typically with very short lead times and an affordable pricing structure.

As with our standard bearing solutions, non-standard components are manufactured under DIN/ISO 14001 and ISO/TS 16949 quality management systems. We can also provide factory certifications and test reports for initial samples according to customer specifications.

Contact our technical support team anytime to discuss how we can develop a non-standard bearing solution for your application.

Bearing Application Data Sheet

Not sure which GGB part fits your application requirements? Go to ggbpartfinder.com to complete a Bearing Application Data Sheet online, and one of our GGB bearing specialists will reach out to you with recommended options that meet your application requirements. You can also complete the form below and share it with your GGB sales person or distributor representative.

DATA FOR BEARING DESIGN CALCULATION

Application: _____

_____

Project / No.: _____ Quantity: _____ ☐ New Design ☐ Existing Design

DIMENSIONS (mm)

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

LOAD

Radial load static [N]	F dynamic [N]	
Axial load static [N]	F dynamic [N]	
Specific load radial [MPa]	p axial [MPa]	

MOVEMENT

Rotational speed	N [1/min]	
Speed	U [m/s]	
Length of stroke	L_S [mm]	
Frequency of stroke	[1/min]	
Oscillating cycle	ϕ [°]	
Oscillating frequence	N_{OSZ} [1/min]	

MATING SURFACE

Material		
Hardness	HB/HRC	
Surface finish	Ra [µm]	

FITS & TOLERANCES

Shaft	D_J	
Bearing housing	D_H	

OPERATING ENVIRONMENT

Ambient temperature	T_{amb}[°]	

☐ 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

LUBRICATION

☐ Dry

☐ Continuous lubrication

☐ Process fluid lubrication

☐ Initial lubrication only

☐ Hydrodynamic conditions

Process fluid		
Lubricant		
Dynamic viscosity	η	

SERVICE HOURS PER DAY

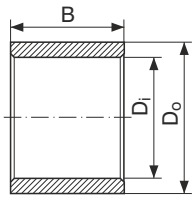
Continuous operation	
Intermittent operation	
Operating time	
Days per year	

SERVICE LIFE

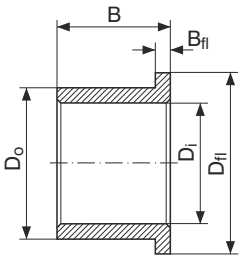
Required service life	L_H [h]	

BEARING TYPE:

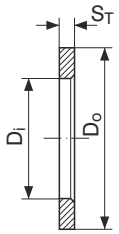
☐ Cylindrical bush



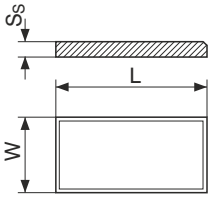
☐ Flanged bush



☐ Thrust washer



☐ Slideplate



☐ Special parts (sketch)

☐ Rotational movement

☐ Steady load

☐ Rotating load

☐ Oscillating movement

☐ Linear movement

CUSTOMER INFORMATION

Company _____

Street _____

City / State / Province / Post Code _____

Telephone _____ Fax _____

Name _____

Email Address _____ Date _____

Product Information

GGB gives an assurance that the products described in this document have no manufacturing errors or material deficiencies.

The details set out in this document are registered to assist in assessing the material's suitability for the intended use. They have been developed from our own investigations as well as from generally accessible publications. They do not represent any assurance for the properties themselves.

Unless expressly declared in writing, GGB gives no warranty that the products described are suited to any particular purpose or specific operating circumstances. GGB accepts no liability for any losses, damages or costs however they may arise through direct or indirect use of these products.

GGB's sales and delivery terms and conditions, included as an integral part of quotations, stock and price lists, apply absolutely to all business conducted by GGB. Copies can be made available on request.

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

Edition 2015 (This edition replaces earlier editions which hereby lose their validity).

Statement Regarding Lead Content in GGB Products & EU Directive Compliance

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 strictly followed. This includes RoHS and REACH guidelines.

GGB makes it a top priority to operate 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 ISO TS 16949, ISO 9001, ISO 14001, ISO 50001 and OHSAS 18001 quality regulations.

All of our certificates can be found here: http://www.ggbearings.com/en/company/certificates. A detailed explanation of our commitment to REACH and RoHS directives can be found at www.ggbearings.com/en/company/quality-and-environment.

Fabrication

At temperatures up to 250°C the polytetrafluroethylene (PTFE) present in the lining material is completely inert so that even on the rare occasions in which DP4®, DP4-B™, DP10™ or DP11™ bushes are drilled or sized after assembly there is no danger in boring or burnishing.

At higher temperatures however, small quantities of toxic fumes can be produced and the direct inhalation of these can cause an influenza type of illness which may not appear for some hours but which subsides without after-effects in 24-48 hours.

Such fumes can arise from PTFE particles picked up on the end of a cigarette. Therefore smoking should be prohibited where DP4®, DP4-B™, DP10™ or DP11™ are being machined.





GGB
BEARING TECHNOLOGY

an EnPro Industries company

The Global Leader in High Performance Bearing Solutions

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