Product Range

Maintenance-free, self lubricating bearings

Technical Information

GGB
BEARING TECHNOLOGY

an EnPro Industries company

Customer Service

Standard and special parts
batch and small batch production according to DIN/ISO or customer drawings

Bearing life calculations
based on your application specifications

Support service
our field staff and bearing specialists are always available for you

Continuous advancement
we strive to improve our bearings and bearing materials to meet the increasing demands of our customers

Worldwide distribution system
Delivery within 24 hours for standard parts

Comprehensive technical literature
also available as PDF-files for downloading on our website
www.ggbearings.com

This corporate brochure is available for download under **www.ggbearings.com**

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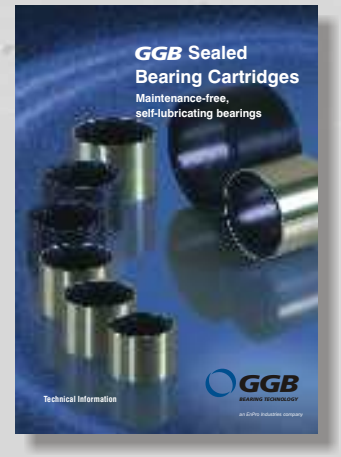

EnPro Industries, Inc.

is a leading manufacturer of sealings, compressor systems and other applied products. EnPro Industries delivers products for high demanding applications to all industries worldwide.

Besides GGB, Quincy Compressor, Garlock Sealing Technologies, Stemco, Fairbanks Morse Engine, Haber/Sterling, Garlock Rubber Technologies and Plastomer Technologies are part of EnPro industries.

- Registered office in Charlotte, North Carolina
- Annual sales in 2008: 1,17 Mrd USD
- 5100 employees
- 43 production facilities
- more than 50,000 customers worldwide

www.enproindustries.com

These certificates are also available for download on our website **www.ggbearings.com**.

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 2009 (This edition replaces earlier editions which hereby lose their validity).

Declaration on lead contents of GGB products/compliance with EU law

Since July 1, 2006 it has been prohibited under Directive 2002/95/EC (restriction of the use of certain hazardous substances in electrical and electronic equipment; ROHS Directive) to put products on the market that contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE). Certain applications listed in the annex to the ROHS Directive are exempted. A maximum concentration value of 0.01% by weight and per homogeneous material, for cadmium and of 0.1% by weight and per homogeneous material, for lead, mercury, hexavalent chromium, PBB and PBDE shall be tolerated.

According to Directive 2000/53/EC on end-of life vehicles, since July 1, 2003 it has been prohibited to put on the market materials and components that contain lead, mercury, cadmium or hexavalent chromium. Due to an exceptional provision, lead-containing bearing shells and bushes could still be put on the market up until July 1, 2008. This general exception expired on July 1, 2008. A maximum concentration value of up to 0.1% by weight and per homogeneous material, for lead, hexavalent chromium and mercury shall be tolerated.

All products of GGB in this brochure, with the exception of DU, DUB, SY and SP satisfy these requirements of Directives 2002/95/EC (ROHS Directive) and 2000/53/EC (End-of-life Vehicle Directive).

All products manufactured by GGB are also compliant with REACH Regulation (EC) No. 1 907/2006 of December 18, 2006.

Summary of bearing materials and products

Material name	Composition	Working conditions	Page
DU®	**Metal-polymer-composite material** St + porous bronze sinter + PTFE + Pb	**self lubricating**	8
DU®B	**Metal-polymer-composite material** Bz + porous bronze sinter + PTFE + Pb	**self lubricating** **corrosion resistant**	8
DP4™	**Metal-polymer-composite material** St + porous bronze sinter + PTFE + fillers	**self lubricating** **low-maintenance**	8
DP4B™	**Metal-polymer-composite material** Bz + porous bronze sinter + PTFE + fillers	**self lubricating** **corrosion resistant**	10
DP10™ New!	**Metal-polymer-composite material** St + porous bronze sinter + PTFE + solid lubricants	**self lubricating** **low-maintenance**	10
DP11™ New!	**Metal-polymer-composite material** St + porous bronze sinter + PTFE + solid lubricants + fillers	**self lubricating** **low-maintenance**	10
DP31™	**Metal-polymer-composite material** St + porous bronze sinter + PTFE + fluoropolymer + fillers	**low-maintenance**	12
DX®	**Metal-polymer-composite material** St + porous bronze sinter + POM with lubrication indents	**low-maintenance**	12
DX10 with DuraStrong™ technology New!	**Metal-polymer-composite material** St + porous bronze sinter + high tech polymer with or without lubrication indents	**low-maintenance**	12
HX™	**Metal-polymer-composite material** St + porous bronze sinter + PEEK + PTFE + fillers	**low-maintenance**	14
DS™	**Metal-polymer-composite material** St + porous bronze sinter + POM modified	**self lubricating** **low-maintenance**	14
SY™	**Steel-lead-bronze-compound material** St + CuPb10Sn10 with lubrication indents	**low-maintenance**	14
SP™	**Steel-lead-bronze-compound material** St + CuPb26Sn2	**low-maintenance**	16
EP™	**Injection moulded thermoplastic material** PA6.6T + glass fibres + PTFE + graphite	**self lubricating**	16
EP12™	**Injection moulded thermoplastic dry bearing material** POM + PTFE	**self lubricating**	16
EP22™	**Injection moulded thermoplastic dry bearing material** PBT + PTFE	**self lubricating**	18
EP43™	**Injection moulded thermoplastic dry bearing material** PPS + PTFE + aramid	**self lubricating**	18
EP44™	**Injection moulded thermoplastic dry bearing material** PPS + PTFE + carbon fibres	**self lubricating**	18
EP63™	**Injection moulded thermoplastic dry bearing material** PEEK + PTFE + aramid	**self lubricating**	20
EP64™	**Injection moulded thermoplastic dry bearing material** PEEK + PTFE + graphite + carbon fibres	**self lubricating**	20
EP73™	**Injection moulded thermoplastic dry bearing material** PAI + graphite + PTFE	**self lubricating**	20
EP79™	**Injection moulded thermoplastic dry bearing material** PAI + carbon fibres + PTFE	**self lubricating**	22
Glacetal KA™	**Polyacetal-Copolymer bearing material** (POM)	**self lubricating** **low-maintenance**	22
Multilube® New!	**Dry bearing material** Proprietary injection molded engineering thermoplastic	**self lubricating**	22

Summary of bearing materials and products

Material name	Composition	Working conditions	Page
Multifil™ New!	**Dry bearing material** PTFE + proprietary filler system	**self lubricating**	**24**
DB™ New!	**Dry bearing material** Cast bronze + solid lubricant inserts	**self lubricating**	**24**
GAR-MAX®	**Composite material** Sliding layer: Continuous wound PTFE and high-strength fibres encapsulated in an internally lubricated, high temperature filled epoxy resin - Backing: Continuous wound fiber-glass encapsulated in a high temperature epoxy resin.	**self lubricating**	**24**
HSG™ High-Strength GAR-MAX®	**Composite material** Sliding Layer: Continuous wound PTFE and high-strength fibres encapsulated in an internally lubricated, high temperature filled epoxy resin - Backing: Continuous wound fiber-glass encapsulated in a high temperature epoxy resin.	**self lubricating**	**26**
GAR-FIL® New!	**Composite material** Backing: Continuous wound fiberglass encapsu-lated in a high temperature epoxy resin. Sliding layer: Proprietary filled PTFE tape liner, 0,38 mm (0,015 inch) standard thickness, 0,76 mm (0,03 inch) on request.	**self lubricating**	**26**
MLG™ New!	**Composite material** Sliding layer: Continuous wound PTFE and high-strength fibers encapsulated in high temperature epoxy resin Backing verbiage: Continuous wound fiberglass encapsulated in high temperature epoxy resin	**self lubricating**	**26**
HPF™ New!	**Composite material** Sliding layer: Proprietary filled PTFE tape liner Backing: Continuous woven fiberglass cloth laminate impregnated and cured with epoxy resin	**self lubricating**	**28**
HPM™ New!	**Composite material** Sliding layer: Continuous wound PTFE and high-strength fibers encapsulated in a self-lubricating, high temperature epoxy resin - Backing: Continuous wound fiberglass encapsulated in a high temperature epoxy resin	**self lubricating**	**28**
MEGA*LIFE*® XT	**Composite material** Sliding layer: Proprietary filled PTFE tape liner on both sides - Core: Continuously woven layer of filament fiberglass encapsulated in a high temperature epoxy resin	**self lubricating**	**28**
SBC™ Sealed Bearing Cartridges	**Composite material with sealing** SBC bearings are available with GAR-MAX and HSG and are sealed to exclude contaminants. SBC are optionally available with a steel outer shell.	**self lubricating** **low-maintenance**	**30**
Sintered Bronze Bearings	**Bronze sinter impregnated with oil** similar to Sint A50, impregnation group 1	**self lubricating** (impregnated with oil)	**30**
Machined Bronze Bearings acc. to ISO 4379	**Solid bronze alloy bearings**	**conventional lubrication**	**30**

Other Products			
Bushing Blocks	**Bushing blocks made from aluminium alloys** for use with different GGB cylindrical bushes	**depends on used bearing material**	**32**
EXALIGN™-, UNI™- and MINI™-bearing housings	**Self-aligning bearing housings**	**self lubricating** **initial lubrication**	**32** **34**

Standard Bearings	
Standard Dimensions / Data	**36**

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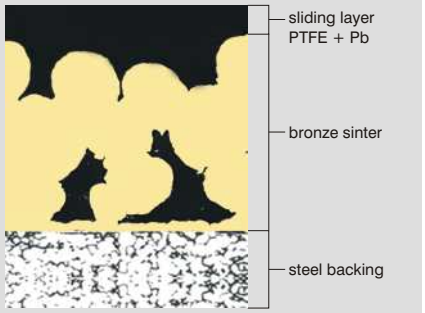
Product Range

DU® Bearing Material

Structure

Metal-polymer-composite material
Steel + porous bronze sinter + PTFE + Pb



Features

- Dry bearing material with very good wear and friction performance over a wide range of loads, speeds and temperature conditions
- DU® also performs well with lubrication
- Available from stock in a wide range of standard sizes

Possible 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.

Availability

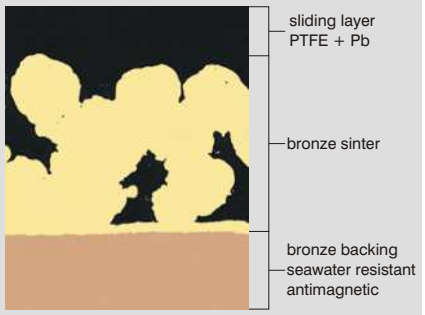
Ex stock:
Standard cylindrical bushes, roll-formed bushes, flanged bushes, thrust washers, flanged washers, strip

To order:
Non-standard parts

DU®B Bearing Material

Structure

Metal-polymer-composite material
Bronze + porous bronze sinter + PTFE + Pb



Features

- Dry bearing material with very good wear and friction performance over a wide range of load, speed and temperature conditions
- DU®B also performs well with lubrication
- Bronze backing provides improved corrosion resistance compared with DU®
- Available from stock in a wide range of standard sizes
- Antimagnetic
- DU®B material approved according to EN1337-2 standard for structural bearings for civil engineering applications

Possible Applications

Industrial:
see DU®

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

Availability

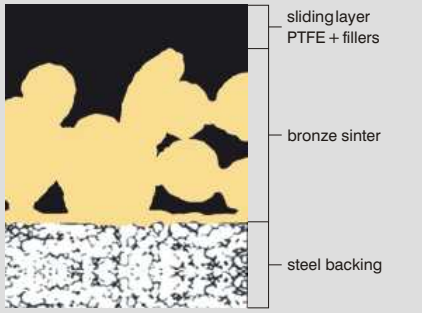
Ex stock:
Standard cylindrical bushes, flanged bushes and strip

To order:
Thrust washers, flanged washers and non-standard parts

DP4™ Bearing Material

Structure

Metal-polymer-composite material
Steel + porous bronze sinter + PTFE + fillers



Features

- Compliant with the European Union's End of Life Vehicles (ELV) directive 2000/53/EC on the elimination of hazardous materials in the construction of passenger cars and light trucks
- Compliant with the European Union Directive 2002/95/EC concerning the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS Regulation)

Lubricated conditions:

- Good wear resistance and low friction performance over a wide range of load, speed and temperature conditions
- Very good performance in oil lubricated heavy duty hydraulic applications
- DP4™ offers benefits in applications where corrosion of the lead in DU® may occur
- DP4™ offers improved wear and friction performance along with good chemical resistance compared to DU®

Dry conditions:

- DP4™ performs well dry under light duty applications
- Particularly suitable for intermittent operation under reciprocating or oscillating movements

Possible Applications

Automotive:
Braking systems, clutches, gearbox and transmissions, hinges: door, bonnet, boot, cabriolet roof tops, pedals; pumps: axial piston, 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.

Availability

Ex stock:
Cylindrical bushes, flanged bushes, thrust washers, flanged washers and strip

To order:
Non-standard parts

DU® Bearing Material

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	250 140
Maximum sliding speed U	- dry	m/s	2.5
Maximum $\bar{p}$U factor	- dry, continuous operation - dry, intermittent operation	N/mm² x m/s	1.8 3.5
Maximum temperature T_{max}		°C	+280
Minimum temperature T_{min}		°C	- 200
Coefficient of friction f	- dry - oil lubricated	- -	0.02 - 0.25 0.02 - 0.12
Shaft surface finish Ra	- dry operation	µm	0.4 ± 0.1
Shaft hardness		HB	hardened and un-hardened possible

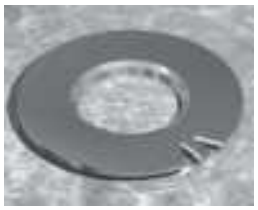
Usage

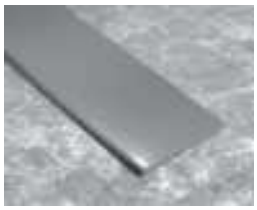
dry	**very good**
oil lubricated	**good**
grease lubricated	**fair**
water lubricated	**fair**
process fluid lubricated	**fair**


Cylindrical bushes


Flanged bushes


Thrust washers


Flanged washers


Strips

DU®B Bearing Material

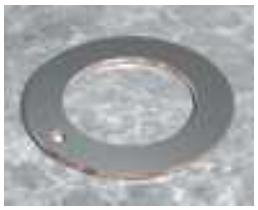
Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	140 140
Maximum sliding speed U	- dry	m/s	2.5
Maximum $\bar{p}$U factor	- dry, continuous operation - dry, intermittent operation	N/mm² x m/s	1.8 3.5
Maximum temperature T_{max}		°C	+280
Minimum temperature T_{min}		°C	- 200
Coefficient of friction f	- dry - oil lubricated	- -	0.02 - 0.25 0.02 - 0.12
Shaft surface finish Ra	- dry operation	µm	0.4 ± 0.1
Shaft hardness		HB	hardened and un-hardened possible

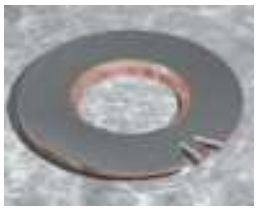
Usage

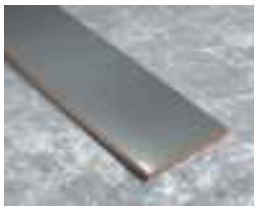
dry	**very good**
oil lubricated	**good**
grease lubricated	**fair**
water lubricated	**good**
process fluid lubricated	**fair**


Cylindrical bushes


Flanged bushes


Thrust washers


Flanged washers

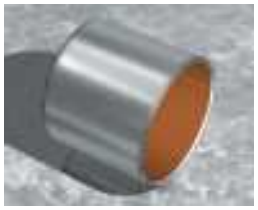

Strips

DP4™ Bearing Material

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	250 140
Maximum sliding speed U	- dry - oil lubricated	m/s	2.5 5.0
Maximum $\bar{p}$U factor	- dry - oil lubricated	N/mm² x m/s	1.0 10.0
Maximum temperature T_{max}		°C	+280
Minimum temperature T_{min}		°C	- 200
Coefficient of friction f	- dry - oil lubricated	- -	0.04 - 0.25 0.02 - 0.08
Shaft surface finish Ra	- dry operation	µm	0.4 ± 0.1
Shaft hardness		HB	>200

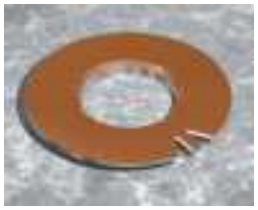
Usage

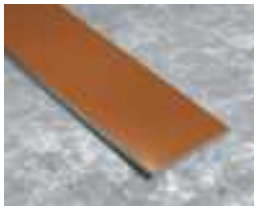
dry	**good**
oil lubricated	**very good**
grease lubricated	**good**
water lubricated	**fair**
process fluid lubricated	**good**


Cylindrical bushes


Flanged bushes


Thrust washers


Flanged washers

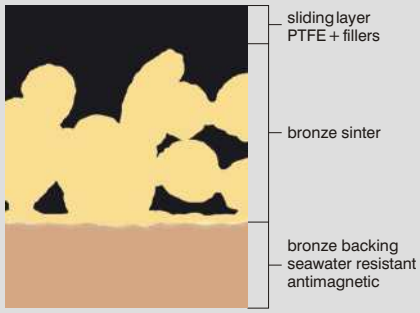

Strips

Product Range

DP4B™ Bearing Material

Structure

Metal-polymer-composite material
Bz + porous bronze sinter + PTFE + fillers



Features

- Compliant with the European Union's End of Life Vehicles (ELV) directive 2000/53/EC on the elimination of hazardous materials in the construction of passenger cars and light trucks
- Compliant with the European Union Directive 2002/95/EC concerning the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (the RoHS Regu-lations)
- Bronze backing provides improved corrosion resistance compared with DP4™ and is anti-magnetic

Lubricated conditions:

- Good wear resistance and low friction performance over a wide range of load, speed and temperature conditions
- Very good performance in oil lubricated heavy duty hydraulic applications
- DP4B™ offers benefits in applications where corrosion of the lead in DU® may occur
- DP4B™ offers improved wear and friction performance along with good chemical resistance compared to DU®

Dry conditions:

- DP4B™ performs well dry under light duty applications
- Particularly suitable for intermittent operation under reciprocating or oscillating movements

Possible Applications

Industrial: see DU®B

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

Availability

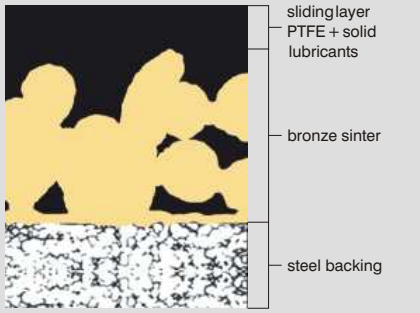
Ex stock:
Standard cylindrical bushes, flanged bushes and strip partly

To order:
Thrust washers, flanged washers and non-standard parts

DP10™ Bearing Material

Structure

Metal-polymer-composite material
Steel + porous bronze sinter + PTFE + solid lubricants



Features

- Compliant with the European Union's End of Life Vehicles (ELV) directive 2000/53/EC on the elimination of hazardous materials in the construction of passenger cars and light trucks
- Compliant with the European Union directive 2002/95/EC concerning the restriction of the use of certain hazardous substances in electrical and electronic equipment (the RoHS Regulations)
- Good dry wear resistance and low friction performance over a wide range of loads, speeds and temperature conditions
- Performs well with lubrication, particularly under marginally lubricated conditions

Possible 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.

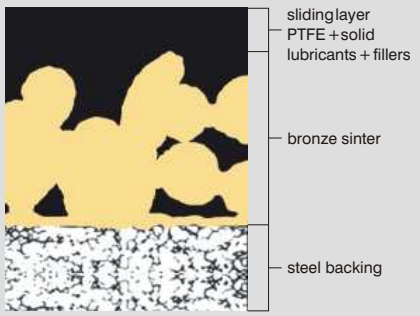
Availability

Ex stock: N/A
To order: Cylindrical bushes, flanged bushes, thrust washers, flanged washers, half bearings, flat components, deep drawn parts, pressings, stampings, modified standard components

DP11™ Bearing Material

Structure

Metal-polymer-composite material
Steel + porous bronze sinter + PTFE + solid lubricants + fillers



Features

- Compliant with the European Union's End of Life Vehicles (ELV) directive 2000/53/EC on the elimination of hazardous materials in the construction of passenger cars and light trucks
- Compliant with the European Union directive 2002/95/EC concerning the restriction of the use of certain hazardous substances in electrical and electronic equipment (the RoHS Regulations)
- Good dry wear and low friction performance over a wide range of loads, speeds and temperature conditions
- Very good dry wear resistance and low friction performance under high frequency and low amplitude oscillating movements

Possible Applications

Automotive:
Belt tensioners, clutches, dual mass flywheels, pulley dampers, etc.

Industrial:
Applications with high frequency and low amplitude oscillating movements

Availability

Ex stock:
N/A

To order:
Cylindrical bushes, flanged bushes, thrust washers, flanged washers, strip, non-standard parts

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	140 140
Maximum sliding speed U	- dry - oil lubricated	m/s	2.5 5.0
Maximum $\bar{p}$U factor	- dry - oil lubricated	N/mm² x m/s	1.0 10.0
Maximum temperature T_{max}		°C	+280
Minimum temperature T_{min}		°C	- 200
Coefficient of friction f	- dry - oil lubricated	- -	0.04 - 0.25 0.02 - 0.08
Shaft surface finish Ra	- dry operation	µm	0.4 ± 0.1
Shaft hardness		HB	>200

DP4B™ Bearing Material

Usage

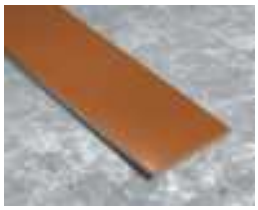
dry	**good**
oil lubricated	**very good**
grease lubricated	**good**
water lubricated	**good**
process fluid lubricated	**good**


Cylindrical bushes


Flanged bushes


Thrust washers


Flanged washers


Strips

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	250 140
Maximum sliding speed U	- dry - oil lubricated	m/s	2.5 5.0
Maximum $\bar{p}$U factor	- dry - oil lubricated	N/mm² x m/s	1.0 10.0
Maximum temperature T_{max}		°C	+280
Minimum temperature T_{min}		°C	- 200
Coefficient of friction f	- dry - oil lubricated	- -	0.03 - 0.25 0.02 - 0.08
Shaft surface finish Ra	- dry operation	µm	0.4 ± 0.1
Shaft hardness		HB	>200

DP10™ Bearing Material

Usage

dry	**good**
oil lubricated	**good**
grease lubricated	**fair**
water lubricated	**not recommended**
process fluid lubricated	**fair**


Cylindrical bushes


Flanged bushes


Thrust washers


Strips


Special parts

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	250 140
Maximum sliding speed U	- dry - oil lubricated	m/s	2.5 5.0
Maximum $\bar{p}$U factor	- dry - oil lubricated	N/mm² x m/s	1.0 10.0
Maximum temperature T_{max}		°C	+280
Minimum temperature T_{min}		°C	- 200
Coefficient of friction f	- dry - oil lubricated	- -	0.04 - 0.25 0.02 - 0.08
Shaft surface finish Ra	- dry operation	µm	0.4 ± 0.1
Shaft hardness		HB	>200

DP11™ Bearing Material

Usage

dry	**good**
oil lubricated	**good**
grease lubricated	**fair**
water lubricated	**not recommended**
process fluid lubricated	**fair**


Cylindrical bushes


Flanged bushes


Thrust washers


Strips

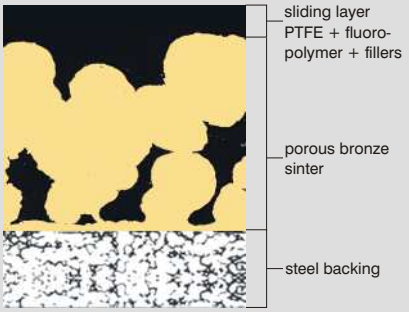

Special parts

Product Range

DP31™ Bearing Material

Structure

Metal-polymer-composite material
Steel + porous bronze sinter + PTFE + fluoropolymer + fillers



Features

- Compliant with the European Union's End of Life Vehicles (ELV) directive 2000/53/EC on the elimination of hazardous materials in the construction of passenger cars and light trucks
- Compliant with the European Union directive 2002/95/EC concerning the restriction of the use of certain hazardous substances in electrical and electronic equipment (the RoHS Regulations)

Lubricated conditions:

- Excellent wear resistance and low friction performance in lubricated hydraulic applications
- Excellent chemical resistance
- Excellent cavitation and flow erosion resistance
- Good fatigue strength

Possible 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.

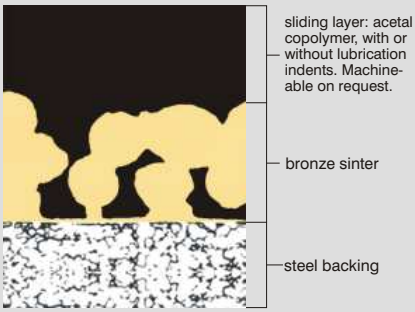
Availability

To order:
Cylindrical bushes, flanged bushes, thrust washers, flanged washers, strip, non-standard parts

DX® Bearing Material

Structure

Metal-polymer-composite material
Steel + porous bronze sinter + POM with lubrication indents



Features

- Marginally lubricated bearing material for grease or oil lubricated applications
- Standard parts contain grease indents in the sliding layer; plain sliding layer available on request
- Order-related also available with plain sliding layer
- Optimum performance under relatively high loads and low speeds
- Suitable for linear, oscillating and rotating movements
- Wide range of parts available from stock

Possible 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.

Availability

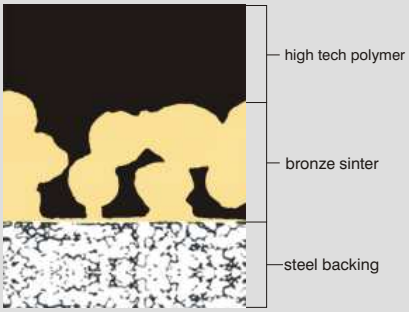
Ex stock:
Cylindrical standard bushes, roll-formed bushes, thrust washers and strip

To order:
Non-standard parts

DX®10 Bearing Material

Structure

Metal-polymer-composite material
Steel + porous bronze sinter + high tech polymer



Features

- Lead-free [Compliance with the European Parliament's End of Life Vehicles directive (ref: 2000/53/EC) on the elimination of hazardous materials in the construction of passenger cars and light trucks]
- Excellent chemical resistance
- Excellent erosion resistance
- Good fatigue strength
- Good wear performance
- Can be broached for tighter tolerances

Possible Applications

Automotive:
Kingpins, oil pumps, suspension joints

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

Availability

To order:
Cylindrical bushes, cylindrical bushes with oil hole, thrust washers, strips and special parts - with or without pin indents

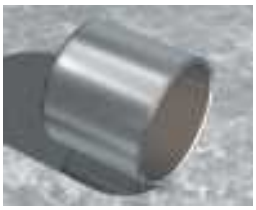
Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	250 140
Maximum sliding speed U	- oil lubricated	m/s	10.0
Maximum $\bar{p}$U factor	- oil lubricated	N/mm² x m/s	10.0
Maximum temperature T_{max}		°C	+280
Minimum temperature T_{min}		°C	- 200
Coefficient of friction f	- oil lubricated	-	0.01 - 0.05
Shaft surface finish Ra		µm	≤ 0,05 - ≤ 0,4*
Shaft hardness		HB	>200

* depending on operating conditions

DP31™ Bearing Material

Usage

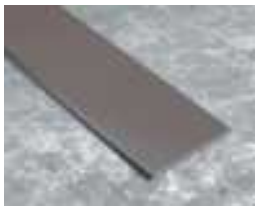
dry	**fair**
oil lubricated	**very good**
grease lubricated	**fair**
water lubricated	**fair**
process fluid lubricated	**good**


Cylindrical bushes


Flanged bushes


Thrust washers


Flanged washers

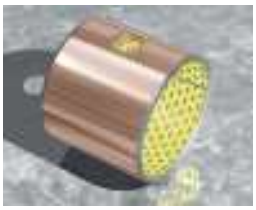

Strips

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	140 70
Maximum sliding speed U	- greased	m/s	2.5
Maximum $\bar{p}$U factor	- greased	N/mm² x m/s	2.8
Maximum temperature T_{max}		°C	+130
Minimum temperature T_{min}		°C	- 40
Coefficient of friction f	- greased	-	0.06 - 0.12
Shaft surface finish Ra		µm	≤ 0.4
Shaft hardness	- normal - for service life >2000 hours	HB HB	>200 >350

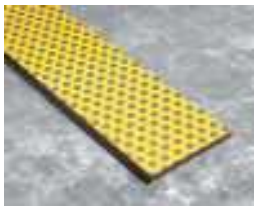
DX® Bearing Material

Usage

dry	**poor**
oil lubricated	**good**
grease lubricated	**very good**
water lubricated	**poor**
process fluid lubricated	**poor**


Cylindrical bushes


Thrust washers


Strips

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	250 140
Maximum sliding speed U	- greased - oil lubricated	m/s m/s	2.5 10.0
Maximum $\bar{p}$U factor	- greased	N/mm² x m/s	2.8
Maximum temperature T_{max}		°C	+175
Minimum temperature T_{min}		°C	- 40
Coefficient of friction f	- greased - oil lubricated	- -	0.01-0.10 0.01-0.06
Shaft surface finish Ra		µm	≤ 0,4
Shaft hardness	- normal - for service life > 2000 hours	HB HB	> 200 > 350

DX®10 Bearing Material

Usage

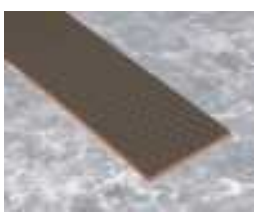
dry	**fair**
oil lubricated	**very good**
grease lubricated	**very good**
water lubricated	**poor**
process fluid lubricated	**fair**

New!

DX®10 with DuraStrong™ technology


Cylindrical bushes


Thrust washers


Strips


Special parts

Product Range

HX™ Bearing Material

Structure

Metal-polymer-composite material
Steel + porous bronze sinter + PEEK + PTFE + fillers

Features

- Marginally lubricated bearing material with good wear resistance under thin lubrication film conditions
- For hydrodynamic applications also available with plain sliding layer
- Suitable for use with low viscosity fluids
- Suitable for use at temperatures up to 250°C
- Bearing polymer lining has good chemical resistance

Possible Applications

Automotive:
Diesel fuel pumps, gear pumps, ABS equipment

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

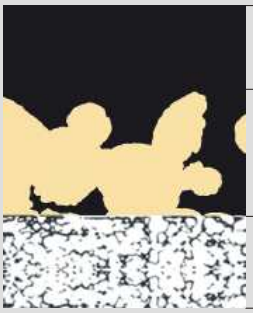
Availability

To order:
Cylindrical bushes, thrust washers, strip and non-standard parts

DS™ Bearing Material

Structure

Metal-polymer-composite material
Steel + porous bronze sinter + POM modified



Features

- Self-lubricating bearing material for operation in mixed film lubrication conditions
- Suitable for marginally lubricated and dry operating conditions
- The sliding layer is machinable (ca. 0.4 mm above bronze sinter layer)
- DS™ does not cause fretting corrosion damage to the shaft under low amplitude oscillating movements
- Performance is similar to DX® but with lower friction

Possible 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.

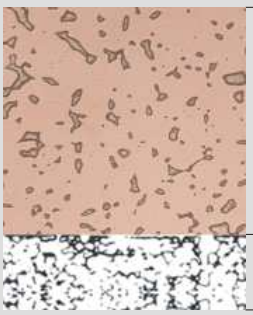
Availability

To order:
Cylindrical bushes, thrust washers, strip and non-standard parts (all forms also available with lubrication indents)

SY™ Bearing Material

Structure

Steel-lead-bronze-compound material
St + CuPb10Sn10 with indents



Features

- Steel-lead-bronze-compound with indents as reservoir for the grease
- High load capacity, very good resistance to fatigue strength at higher temperatures
- Applicable in rough operation conditions
- Particularly suitable for high specific loads with oscillating motion and low frequency

Possible Applications

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

Availability

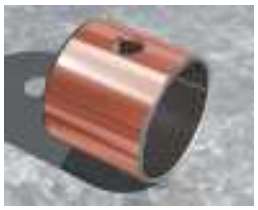
To order:
Cylindrical bushes, thrust washers, strip and special parts

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	140 100
Maximum sliding speed U	- greased - oil lubricated	m/s m/s	2.5 10.0
Maximum $\bar{p}$U factor	- greased	N/mm² x m/s	2.8
Maximum temperature T_{max}		°C	+250
Minimum temperature T_{min}		°C	- 150
Coefficient of friction f	- greased / oil lubricated	-	0.08-0.12 / 0.03-0.08
Shaft surface finish Ra		µm	≤0.4
Shaft hardness	- normal - for service life >2000 hours	HB HB	>200 >350

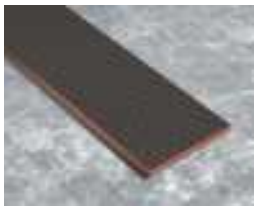
HX™ Bearing Material

Usage

dry	**fair**
oil lubricated	**good**
grease lubricated	**very good**
water lubricated	**good**
process fluid lubricated	**good**


Cylindrical bushes


Thrust washers


Strips

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	110 45
Maximum sliding speed U	- dry - greased / oil lubricated	m/s m/s	1.5 2.5 / 10.0
Maximum $\bar{p}$U factor	- dry - greased / oil lubricated	N/mm² x m/s	1.4 2.8 / 10.0
Maximum temperature T_{max}		°C	+130
Minimum temperature T_{min}		°C	- 60
Coefficient of friction f	- dry - greased / oil lubricated	- -	0.15 - 0.30 0.05-0.10 / 0.03-0.08
Shaft surface finish Ra		µm	≤0.4
Shaft hardness	- normal - for service life >2000 hours	HB HB	>200 >350

DS™ Bearing Material

Usage

dry	**good**
oil lubricated	**very good**
grease lubricated	**very good**
water lubricated	**poor**
process fluid lubricated	**poor**


Cylindrical bushes


Thrust washers


Strips

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	300 140
Maximum sliding speed U	- greased	m/s	2.5
Maximum $\bar{p}$U factor	- greased	N/mm² x m/s	2.8
Max. temperature T_{max}	- greased /oil lubricated	°C	+150 / +250
Minimum temperature T_{min}		°C	- 40
Coefficient of friction f	- greased /oil lubricated	-	0.05-0.12 / 0.04-0.12
Shaft surface finish Ra		µm	≤0.8
Shaft hardness	- normal - for service life >2000 hours	HB HB	>200 >350

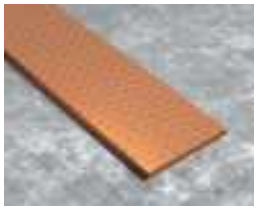
SY™ Bearing Material

Usage

dry	**poor**
oil lubricated	**good**
grease lubricated	**very good**
water lubricated	**poor**
process fluid lubricated	**poor**


Cylindrical bushes


Thrust washers

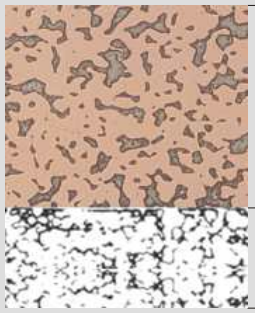

Strips

Product Range

SP™ Bearing Material

Structure

Steel-lead-bronze-compound material
St + CuPb26Sn2



Features

- For lubricated applications with plain sliding layer
- Suitable for oil and grease lubrication
- The bush ID can be machined by boring, reaming, broaching or calibrating

Possible Applications

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

Availability

To order:
Cylindrical bushes and special parts

EP™ Bearing Material

Structure

Injection moulded thermoplastic material
PA6.6T + PTFE + glass fibres + graphite

Features

- Injection moulded reinforced polyamide 6.6T based and modified bearing material
- Good bearing performance in the range of simple / medium working conditions
- The EP™ standard programme is interchangeable with roll-formed bushes according to ISO3547
- Recommended tolerances for fitted bushes: housing h7, shaft h7 - h9
- Colour: black

Possible Applications

Generally applicable within the limits of the material properties.

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

Availability

Ex stock:
Cylindrical bushes, flanged bushes and rod stock

To order:
Non-standard parts

EP12™ Bearing Material

Structure

Injection moulded thermoplastic
dry bearing material
POM + PTFE

Features

- Injection moulded polyoxymethylene based and modified bearing material.
- Colour: white

Possible Applications

Generally applicable within the limits of the material properties.

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

Availability

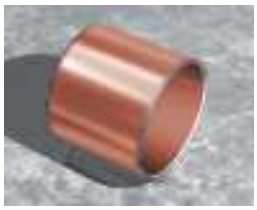
To order:
Bushes, special dimensions and shapes

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	250 120
Maximum sliding speed U	- greased	m/s	2.5
Maximum $\bar{p}$U factor	- greased	N/mm² x m/s	2.8
Max. temperature T_{max}	- greased /oil lubricated	°C	+150 / +250
Minimum temperature T_{min}		°C	- 50
Coefficient of friction f	- greased /oil lubricated	-	0.05-0.12 / 0.04-0.12
Shaft surface finish Ra		µm	≤ 0.4
Shaft hardness	- normal - for service life >2000 hours	HB HB	>200 >350

SP™ Bearing Material

Usage

dry	**poor**
oil lubricated	**good**
grease lubricated	**good**
water lubricated	**poor**
process fluid lubricated	**poor**



Cylindrical bushes

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	N/mm²	80
Maximum sliding speed U	- dry	m/s	1.0
Maximum $\bar{p}$U factor*	- for A_H/A_C = 5 - for A_H/A_C = 10 - for A_H/A_C = 20	N/mm² x m/s	0.06 0.24 1.0
Maximum temperature T_{max}		°C	+140
Minimum temperature T_{min}		°C	- 40
Coefficient of friction f	- dry	-	0.15 - 0.30
Shaft surface finish Ra		µm	0.5 ± 0.3
Shaft hardness		HV	>200

* the $\bar{p}$U limit is depending on the heat dissipating surface to contact area ratio

EP™ Bearing Material

Usage

dry	**good**
oil lubricated	**good**
grease lubricated	**good**
water lubricated	**fair**
process fluid lubricated	**good after resistance testing**

Cylindrical bushes

Flanged bushes

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	N/mm²	65
Maximum sliding speed U	- dry	m/s	1.0
Maximum $\bar{p}$U factor*	- for A_H/A_C = 5 - for A_H/A_C = 10 - for A_H/A_C = 20	N/mm² x m/s	0.04 0.09 0.18
Maximum temperature T_{max}		°C	+125
Minimum temperature T_{min}		°C	- 40
Coefficient of friction f	- dry	-	0.18 - 0.30
Shaft surface finish Ra		µm	0.3 ± 0.2
Shaft hardness		HV	>200

* the $\bar{p}$U limit is depending on the heat dissipating surface to contact area ratio

EP12™ Bearing Material

Usage

dry	**good**
oil lubricated	**good**
grease lubricated	**good**
water lubricated	**fair**
process fluid lubricated	**good after resistance testing**

Cylindrical bushes

Flanged bushes

Thrust washers

Special parts

Product Range

EP22™ Bearing Material

Structure

Injection moulded thermoplastic dry bearing material
PBT + PTFE

Injection moulded thermoplastic dry bearing material with additives homogeneously mixed in

Features

- Injection moulded polybutylenterephtalate based and modified bearing material.
- Good price/performance ratio
- Colour: white

Possible Applications

Generally applicable within the limits of the material properties.

Automotive:
Pedal bearings, steering columns, axles

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

Availability

Ex stock:
Cylindrical bushes, flanged bushes and rod stock

To order:
Non-standard parts

EP43™ Bearing Material

Structure

Injection moulded thermoplastic dry bearing material
PPS + PTFE + Aramid

Injection moulded thermoplastic dry bearing material with additives homogeneously mixed in

Features

- Injection moulded reinforced polyphenylensulfide based and modified bearing material
- Good chemical and hydrolysis resistance
- Very low friction, optimised for dry running conditions
- High dimensional stability
- Colour: brown

Possible Applications

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

Availability

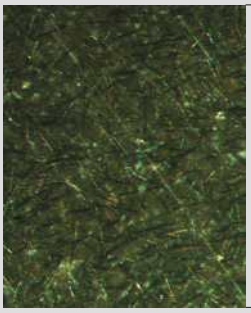
Ex stock:
Cylindrical bushes, flanged bushes and rod stock

To order:
Non-standard parts

EP44™ Bearing Material

Structure

Injection moulded thermoplastic dry bearing material
PPS + PTFE + carbon fibres



Injection moulded thermoplastic dry bearing material with additives homogeneously mixed in

Features

- Injection moulded reinforced polyphenylensulfide based and modified bearing material.
- Good chemical and hydrolysis resistance
- Excellent in lubricated applications
- High dimensional stability
- Colour: black

Possible Applications

Generally applicable within the limits of the material properties.

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

Availability

To order:
Bushes, special dimensions and shapes

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	N/mm²	50
Maximum sliding speed U	- dry	m/s	1.0
Maximum $\bar{p}$U factor*	- for A_H/A_C = 5 - for A_H/A_C = 10 - for A_H/A_C = 20	N/mm² x m/s	0.05 0.10 0.20
Maximum temperature T_{max}		°C	+170
Minimum temperature T_{min}		°C	- 50
Coefficient of friction f	- dry	-	0.22 - 0.37
Shaft surface finish Ra		µm	0.3 ± 0.2
Shaft hardness		HV	>200

* the $\bar{p}$U limit is depending on the heat dissipating surface to contact area ratio

EP22™ Bearing Material

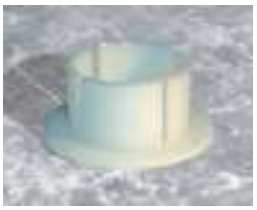
Usage

dry	**good**
oil lubricated	**good**
grease lubricated	**good**
water lubricated	**very good**
process fluid lubricated	**good after resistance testing**


Cylindrical bushes


Flanged bushes


Thrust washers


Special parts


Rod stock

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	N/mm²	83
Maximum sliding speed U	- dry	m/s	1.0
Maximum $\bar{p}$U factor*	- for A_H/A_C = 5 - for A_H/A_C = 10 - for A_H/A_C = 20	N/mm² x m/s	0.22 0.90 3.59
Maximum temperature T_{max}		°C	+240
Minimum temperature T_{min}		°C	- 40
Coefficient of friction f	- dry	-	0.11 - 0.20
Shaft surface finish Ra		µm	0.5 ± 0.3
Shaft hardness		HV	>200

* the $\bar{p}$U limit is depending on the heat dissipating surface to contact area ratio

EP43™ Bearing Material

Usage

dry	**very good**
oil lubricated	**good**
grease lubricated	**good**
water lubricated	**fair**
process fluid lubricated	**good after resistance testing**


Cylindrical bushes


Flanged bushes


Thrust washers


Special parts


Rod stock

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	N/mm²	95
Maximum sliding speed U	- dry	m/s	1.0
Maximum $\bar{p}$U factor*	- for A_H/A_C = 5 - for A_H/A_C = 10 - for A_H/A_C = 20	N/mm² x m/s	0.11 0.42 1.69
Maximum temperature T_{max}		°C	+240
Minimum temperature T_{min}		°C	- 40
Coefficient of friction f	- dry	-	0.16 - 0.26
Shaft surface finish Ra		µm	0.5 ± 0.3
Shaft hardness		HV	>450

* the $\bar{p}$U limit is depending on the heat dissipating surface to contact area ratio

EP44™ Bearing Material

Usage

dry	**good**
oil lubricated	**good**
grease lubricated	**good**
water lubricated	**fair**
process fluid lubricated	**good after resistance testing**


Cylindrical bushes


Flanged bushes


Thrust washers

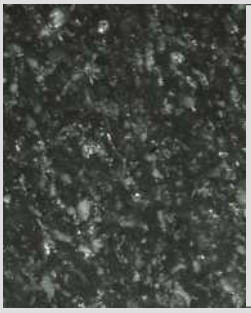

Special parts

Product Range

EP63™ Bearing Material

Structure

Injection moulded thermoplastic dry bearing material
PEEK + PTFE + Aramid



Injection moulded thermoplastic dry bearing material with additives homogeneously mixed in

Features

- Injection moulded reinforced polyetheretherketone based and modified bearing material
- High temperature material with low thermal expansion for demanding components
- Optimized for dry running conditions
- High viscosity and mechanical strength
- High wear resistance in oscillating movements
- Good chemical and hydrolysis resistance
- Colour: black

Possible Applications

Generally applicable within the limits of the material properties.

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

Availability

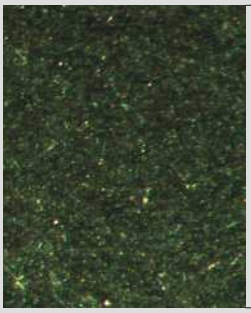
Ex stock:
Cylindrical bushes and flanged bushes

To order:
Non-standard parts

EP64™ Bearing Material

Structure

Injection moulded thermoplastic dry bearing material
PEEK + PTFE + graphite + carbon fibres



Injection moulded thermoplastic dry bearing material with additives homogeneously mixed in

Features

- Injection moulded reinforced polyetheretherketone based and modified bearing material
- High temperature material with low thermal expansion for demanding components
- Good chemical and hydrolysis resistance
- Excellent in lubricated applications
- High viscosity and mechanical strength
- High wear resistance in oscillating movements
- Colour: black

Possible Applications

Generally applicable within the limits of the material properties.

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

Availability

To order:
Bushes, special dimensions and shapes

EP73™ Bearing Material

Structure

Injection moulded thermoplastic dry bearing material
PAI + graphite + PTFE

Injection moulded thermoplastic dry bearing material consisting of PAI + Graphite + PTFE

Features

- Injection moulded polyamidimide based and modified bearing material.
- Irreversible cross-linked by thermal treatment
- High temperature material with low thermal expansion for demanding components
- High viscosity and mechanical strength
- Good chemical resistance
- High wear resistance in oscillating movements
- Colour: black

Possible Applications

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 aluminium or metal alloys, while providing superior stability and viscosity.

Applicable in extreme high and low temperatures e.g. turbojet engine compressor blade.

Availability

To order: Bushes, special dimensions and shapes

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	N/mm²	90
Maximum sliding speed U	- dry	m/s	1.0
Maximum $\bar{p}$U factor*	- for A_H/A_C = 5 - for A_H/A_C = 10 - for A_H/A_C = 20	N/mm² x m/s	0.16 0.66 2.63
Maximum temperature T_{max}		°C	+290
Minimum temperature T_{min}		°C	- 100
Coefficient of friction f	- dry	-	0.12 - 0.21
Shaft surface finish Ra		µm	0.3 ± 0.2
Shaft hardness		HV	>200

* the $\bar{p}$U limit is depending on the heat dissipating surface to contact area ratio

EP63™ Bearing Material

Usage

dry	**good**
oil lubricated	**good**
grease lubricated	**good**
water lubricated	**fair**
process fluid lubricated	**good after resistance testing**


Cylindrical bushes


Flanged bushes


Thrust washers


Special parts

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	N/mm²	125
Maximum sliding speed U	- dry	m/s	1.0
Maximum $\bar{p}$U factor*	- for A_H/A_C = 5 - for A_H/A_C = 10 - for A_H/A_C = 20	N/mm² x m/s	0.09 0.35 1.40
Maximum temperature T_{max}		°C	+290
Minimum temperature T_{min}		°C	- 100
Coefficient of friction f	- dry	-	0.3 - 0.5
Shaft surface finish Ra		µm	0.3 ± 0.2
Shaft hardness		HV	>450

* the $\bar{p}$U limit is depending on the heat dissipating surface to contact area ratio

EP64™ Bearing Material

Usage

dry	**fair**
oil lubricated	**good**
grease lubricated	**good**
water lubricated	**fair**
process fluid lubricated	**good after resistance testing**


Cylindrical bushes


Flanged bushes


Thrust washers


Special parts

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	N/mm²	105
Maximum sliding speed U	- dry - lubricated	m/s	2.5 5.0
Maximum $\bar{p}$U factor*	- for A_H/A_C = 5 - for A_H/A_C = 10 - for A_H/A_C = 20	N/mm² x m/s	0.10 0.39 1.57
Maximum temperature T_{max}		°C	+260
Minimum temperature T_{min}		°C	- 200
Coefficient of friction f	- dry	-	0.19 - 0.31
Shaft surface finish Ra		µm	0.5 ± 0.3
Shaft hardness		HV	>200

* the $\bar{p}$U limit is depending on the heat dissipating surface to contact area ratio

EP73™ Bearing Material

Usage

dry	**good**
oil lubricated	**good**
grease lubricated	**good**
water lubricated	**fair**
process fluid lubricated	**good after resistance testing**


Cylindrical bushes


Flanged bushes


Thrust washers


Special parts

EP79™ Bearing Material

Structure

Injection moulded thermoplastic bearing material
PAI + carbon fibres + PTFE

Injection moulded thermoplastic bearing material with additives homogeneously mixed in

Features

- Injection moulded polyamidimide based and modified bearing material
- Irreversible cross-linked by thermal treatment
- High temperature material with low thermal expansion for demanding components
- High viscosity and mechanical strength
- Good chemical resistance
- High wear resistance in oscillating movements
- Colour: black

Possible Applications

Generally applicable within the limits of the material properties.

Automotive:
Automatic gears

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

Availability

To order:
Bushes, special dimensions and shapes

Glacetal KA™ Bearing Material

Structure

Polyacetal-copolymer bearing material (POM)

Polyacetal-copolymer

Features

- Suitable for light duty applications only
- Suitable for use dry or oil grease lubrication
- Prevents metal to metal contact between assembly parts

Possible 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

Availability

Ex stock:
Thrust washers

Multilube® Bearing Material

Structure

Proprietary injection moulded engineering thermoplastic

Injection moulded thermoplastic dry bearing material with additives homogeneously mixed in

Features

- Low friction coefficient
- Optimum performance under light-duty conditions
- Injection moulded dry bearing material
- Manufactured by precision injection moulding

Possible Applications

Industrial:
Linkages, seat suspensions

Availability

To order:
Injection moulding allows for a diverse range of shapes and sizes

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	N/mm²	130
Maximum sliding speed U	- lubricated	m/s	10
Maximum $\bar{p}$U factor	- lubricated	N/mm² x m/s	10
Maximum temperature T_{max}		°C	+260
Minimum temperature T_{min}		°C	- 200
Coefficient of friction f	- lubricated	-	0.005 - 0.1
Shaft surface finish Ra		µm	0.5 ± 0.3
Shaft hardness		HV	>500

EP79™ Bearing Material

Usage

dry	**not suitable**
oil lubricated	**very good**
grease lubricated	**very good**
water lubricated	**fair**
process fluid lubricated	**good after resistance testing**


Cylindrical bushes


Flanged bushes


Thrust washers


Special parts

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	20 10
Maximum sliding speed U	- greased	m/s	1.5
Maximum $\bar{p}$U factor	- greased	N/mm² x m/s	0.35
Max. temperature T_{max}		°C	+80
Minimum temperature T_{min}		°C	- 40
Coefficient of friction f	- greased	-	0.08 - 0.12
Shaft surface finish Ra		µm	≤ 0.4
Shaft hardness	- normal - for service life >2000 hours	HB HB	>200 >350

Glacetal KA™ Bearing Material

Usage

dry	**fair**
oil lubricated	**good**
grease lubricated	**good**
water lubricated	**fair**
process fluid lubricated	**fair**


Thrust washers

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	60 30
Maximum sliding speed U	- dry	m/s	1.5
Maximum $\bar{p}$U factor	- dry	N/mm² x m/s	0.6
Maximium temperature T_{max} / T_{max} momentary		°C	+80 / +120
Minimum temperature T_{min}		°C	- 40
Coefficient of friction f	- dry	-	0.1 - 0.2
Shaft surface finish Ra		µm	0.2 - 0.8
Shaft hardness	- normal - for service life >2000 hours	HB	>200 >350

Multilube® Bearing Material

Usage

dry	**good**
oil lubricated	**good**
grease lubricated	**good**
water lubricated	**fair**
process fluid lubricated	**fair**


Cylindrical bushes


Flanged bushes


Special parts

Product Range

Multifil™ Tape Bearing Material

Structure

PTFE + Proprietary filler system

Features

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

Possible Applications

Industrial:
Machine tool ways, gibs and other sliding applications

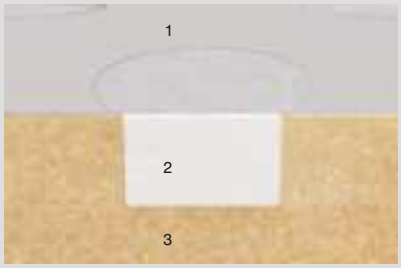
Availability

Ex stock:
Tape with 0.38 to 3.2 mm thickness and 305 mm width

DB™ Bearing Material

Structure

Cast bronze + solid lubricant inserts



1 Sliding surface with running-in film
2 Solid lubricant insert
3 Support (bronze)

Features

- Maintenance-free bearing material for heavy duty applications
- Excellent performance under high loads and intermittent operation
- Graphite-free with solid lubricants
- Long life time due to lower wear rate of solid lubricants compared to graphite

Possible 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.

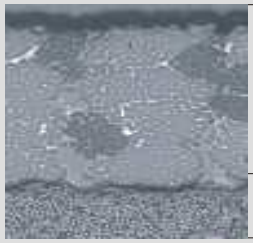
Availability

To order:
Cylindrical bushes, flanged bushes, thrust washers, self-aligning bearings, sliding plates

GAR-MAX® Bearing Material

Structure

Composite material
Sliding Layer
Continuous wound PTFE and high-strength fibres encapsulated in an internally lubricated, high temperature filled epoxy resin.
Backing
Continuous wound fiberglass encapsulated in a high temperature epoxy resin.



Features

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

Possible 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.

Availability

Ex stock:
Cylindrical standard bushes partly available

To order:
Non-standard lengths (short-term), non-standard wall thickness (on request)

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	70 35
Maximum sliding speed U	- dry	m/s	2.5
Maximum $\bar{p}$U factor	- dry - lubricated	N/mm² x m/s	0.32 1.25
Maximium temperature T_{max}		°C	+280
Minimum temperature T_{min}		°C	- 200
Coefficient of friction f	- dry - lubricated	-	1.25 0.05
Shaft surface finish Ra		µm	0.2 - 0.4
Shaft hardness	- normal	HB	>200

Multifil™ Tape Bearing Material

Usage

dry	**very good**
oil lubricated	**very good**
grease lubricated	**very good**
water lubricated	**good**
process fluid lubricated	**good**

Tape

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	200 100
Maximum sliding speed U	- dry	m/s	0.5
Maximum $\bar{p}$U factor, dry		N/mm² x m/s	1.5
Maximum temperature T_{max}		°C	+350
Minimum temperature T_{min}		°C	- 50
Coefficient of friction f	- dry	-	0.05 - 0.18
Shaft surface finish Ra		µm	0.2 - 0.8
Shaft hardness		HB	>200

DB™ Bearing Material

Usage

dry	**good**
oil lubricated	**good**
grease lubricated	**good**
water lubricated	**good**
process fluid lubricated	**fair**

Cylindrical bushes

Flanged bushes

Thrust washers

Self-aligning bearings

Slide plates

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	210 140
Maximum sliding speed U	- dry	m/s	0.13
Maximum $\bar{p}$U factor	- dry	N/mm² x m/s	1.05
Maximium temperature T_{max}		°C	+160
Minimum temperature T_{min}		°C	- 195
Coefficient of friction f	- dry	-	0.05 - 0.30
Shaft surface finish Ra*		µm	0.15 - 0.40
Shaft hardness*	- normal - for service life >2000 hours	HB	>350 >480

* Alternative shaft hardnesses and shaft surface finish is possible, depending on the application. Please contact your local GGB representative.

GAR-MAX® Bearing Material

Usage

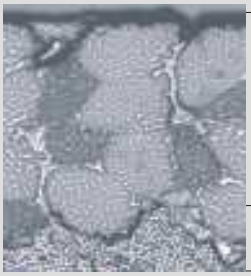
dry	**very good**
oil lubricated	**fair**
grease lubricated	**fair**
water lubricated	**fair**
process fluid lubricated	**poor**

Cylindrical bushes

HSG™ Bearing Material

Structure

Composite material
Sliding Layer
Continuous wound PTFE and high-strength fibres encapsulated in an internally lubricated, high temperature filled epoxy resin
Backing
Continuous wound fiberglass encapsulated in a high temperature epoxy resin



Features

- High Static load capacity - twice as high as standard GAR-MAX®
- Excellent shock and misalignment resistance - better than standard GAR-MAX®
- Excellent contamination resistance
- Very good friction and wear properties
- Good chemical resistance

Possible 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.

Availability

To order
Cylindrical standard bushes and special parts, for material recommendations please contact your local GGB representative

GAR-FIL® Bearing Material

Structure

Composite material
Sliding Layer
Proprietary filled PTFE tape liner, 0,38 mm (0,015 inch) standard thickness, 0,76 mm (0,03 inch) on request
Backing
Continuous wound fiberglass encapsulated in a high temperature epoxy resin

Features

- High load capacity
- Outside and inside diameters can be machined
- Good friction and wear properties under slow speed oscillating movements
- Good chemical resistance
- Excellent resistance against contamination

Possible Applications

Industrial:
Toggle linkages, earthmoving equipment, valves

Availability

Ex stock:
Cylindrical bushes

MLG™ Bearing Material

Structure

Composite material
Sliding layer verbiage
Continuous wound PTFE and high-strength fibers encapsulated in high temperature epoxy resin
Backing verbiage
Continuous wound fiberglass encapsulated in high temperature epoxy resin

Features

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

Possible Applications

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

Availability

To order:
Cylindrical bearings: ID Range: 12 to 150 mm, special order bearing diameters to 500 mm, flanged bearings, non-standard parts

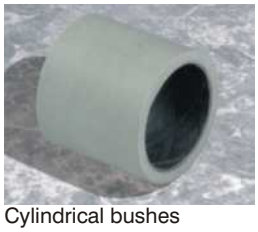
HSG™ Bearing Material

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	415 140
Maximum sliding speed U	- dry	m/s	0.13
Maximum $\bar{p}$U factor	- dry	N/mm² x m/s	1.05
Maximium temperature T_{max}		°C	+160
Minimum temperature T_{min}		°C	- 195
Coefficient of friction f	- dry	-	0,05 - 0,3
Shaft surface finish Ra*		µm	0.2 - 0.8
Shaft hardness*	- normal - for service life >2000 hours	HB	>350 >480

* Alternative shaft hardnesses and shaft surface finish is possible, depending on the application. Please contact your local GGB representative.

Usage

dry	**very good**
oil lubricated	**fair**
grease lubricated	**fair**
water lubricated	**fair**
process fluid lubricated	**fair**



Cylindrical bushes

GAR-FIL® Bearing Material

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	140 140
Maximum sliding speed U	- dry	m/s	2.5
Maximum $\bar{p}$U factor	- dry	N/mm² x m/s	1.23
Maximium temperature T_{max}		°C	+205
Minimum temperature T_{min}		°C	- 195
Coefficient of friction f	- dry	-	0.02 - 0.12
Shaft surface finish Ra*		µm	0.4
Shaft hardness*		HB	>200

* Alternative shaft hardnesses and shaft surface finish is possible, depending on the application. Please contact your local GGB representative.

Usage

dry	**very good**
oil lubricated	**very good**
grease lubricated	**fair**
water lubricated	**fair**
process fluid lubricated	**very good**

Cylindrical bushes

MLG™ Bearing Material

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	210 140
Maximum sliding speed U	- dry	m/s	0.13
Maximum $\bar{p}$U factor	- dry	N/mm² x m/s	1.05
Maximium temperature T_{max}		°C	+160
Minimum temperature T_{min}		°C	- 195
Coefficient of friction f	- dry	-	0.05 - 0.12
Shaft surface finish Ra*		µm	0.4
Shaft hardness*		HB	>350

* Alternative shaft hardnesses and shaft surface finish is possible, depending on the application. Please contact your local GGB representative.

Usage

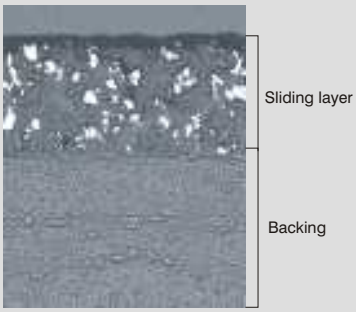
dry	**very good**
oil lubricated	**good**
grease lubricated	**poor**
water lubricated	**fair**
process fluid lubricated	**fair**

Cylindrical bushes

HPF™ Bearing Material

Structure

Composite material
Sliding layer
Proprietary filled PTFE tape liner
Backing
Continuous woven fiberglass cloth laminate impregnated and cured with epoxy resin



Features

- Specifically developed for hydropower applications
- High load capacity
- Excellent shock and edge loading capacity
- Low friction, superior wear rating and bearing life
- Excellent corrosion resistance
- Dimensional stability low water absorption, no swelling
- Environmentally friendly

Possible 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.

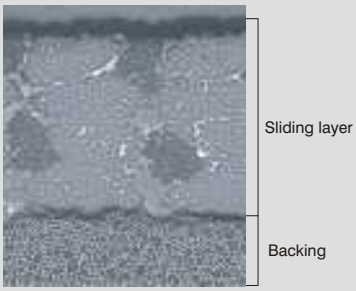
Availability

To order:
Cylindrical bearings diameters up to 500 mm (20 inches); plates in standard thicknesses of 6, 8 and 10 mm (0,24 - 0,3 and 0,39 inch)

HPM™ Bearing Material

Structure

Composite material
Sliding layer
Continuous wound PTFE and high-strength fibers encapsulated in a self-lubricating, high temperature epoxy resin
Backing
Continuous wound fiberglass encapsulated in a high temperature epoxy resin



Features

- Specifically developed for hydropower applications
- High load capacity
- Excellent shock and edge loading capacity
- Low friction, superior wear rating and bearing life
- Excellent corrosion resistance
- Dimensional stability low water absorption, no swelling
- Environmentally friendly

Possible 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.

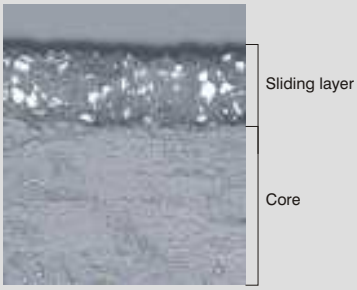
Availability

To order:
Cylindrical bearings up to 500 mm

MEGA*LIFE*® XT Bearing Material

Structure

Composite material
Sliding layer
Proprietary filled PTFE tape liner on both sides
Core
Continuously woven layer of filament glass fibre encapsulated in a high temperature epoxy resin



Features

- 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

Possible Applications

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

Availability

To order:
Thrust washers, standard dimensions from 12 x 24 mm to 75 x 115 mm and wall thicknesses 1,5 - 2,0 - 3,0 mm.

Other dimensions available on request, please contact your local GGB representative

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	140 140
Maximum sliding speed U	- dry	m/s	2.5
Maximum $\bar{p}$U factor	- dry	N/mm² x m/s	1.23
Maximium temperature T_{max}		°C	+140
Minimum temperature T_{min}		°C	- 195
Coefficient of friction f	- dry - lubricated	-	0.02 - 0.12 0.02 - 0.08
Shaft surface finish Ra*		µm	0.15 - 0.40
Shaft hardness*	- normal - for service life >2000 hours	HB	>350 >480

* Alternative shaft hardnesses and shaft surface finish is possible, depending on the application. Please contact your local GGB representative.

Strips

HPF™ Bearing Material

Usage

dry	**very good**
oil lubricated	**very good**
grease lubricated	**poor**
water lubricated	**very good**
process fluid lubricated	**good**

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	140 140
Maximum sliding speed U	- dry	m/s	0.13
Maximum $\bar{p}$U factor	- dry	N/mm² x m/s	1.23
Maximium temperature T_{max}		°C	+160
Minimum temperature T_{min}		°C	- 195
Coefficient of friction f	- dry	-	0.05 - 0.3
Shaft surface finish Ra*		µm	0.2 - 0.8
Shaft hardness*	- normal - for service life >2000 hours	HB	>350 >480

* Alternative shaft hardnesses and shaft surface finish is possible, depending on the application. Please contact your local GGB representative.

Cylindrical bushes

HPM™ Bearing Material

Usage

dry	**very good**
oil lubricated	**fair**
grease lubricated	**poor**
water lubricated	**very good**
process fluid lubricated	**fair**

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	140 140
Maximum sliding speed U	- dry	m/s	0.5
Maximum $\bar{p}$U factor	- dry	N/mm² x m/s	1.23
Maximium temperature T_{max}		°C	+175
Minimum temperature T_{min}		°C	- 195
Coefficient of friction f	- dry	-	0.02 - 0.12
Shaft surface finish Ra*		µm	0.4
Shaft hardness*		HB	>200

* Alternative shaft hardnesses and shaft surface finish is possible, depending on the application. Please contact your local GGB representative.

Thrust washers

MEGA*LIFE*® XT Bearing Material

Usage

dry	**very good**
oil lubricated	**fair**
grease lubricated	**poor**
water lubricated	**very good**
process fluid lubricated	**fair**

SBC™ Sealed Bearing Cartridges

Structure

Composite material with sealing
SBC bearings are available with GAR-MAX and HSG and are sealed to exclude contaminants. SBC are optionally available with a steel outer shell.

Features

- Self-lubricating
- High static load capabilitiy
- Excellent tolerance to shock loading and misalignment
- Contamination resistant
- Very good friction and wear properties
- Good chemical resistance
- Sealed to exclude contaminants, therefore extended service life
- No grease required
  - therefore environmental friendly
  - cost savings by elimination of automated grease system and grease

Possible 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.

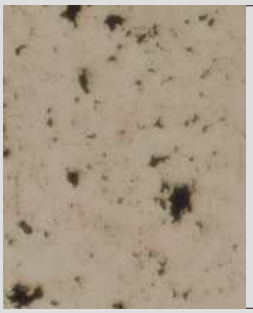
Availability

To order:
Cylindrical bushes, optionally available in a steel outer shell

Sintered Bronze Bearings

Structure

Bronze sinter impregnated with oil, similar to SINT A 50, impregnation group 1



BP25:
8 to 10.5% Sn
others < 2%
rest Cu, impregnation group 1
(up to +80°C)

Features

- 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
- Wide range of parts available from stock

Possible Applications

Industrial:
FHP motor bearings, domestic appliances and hand tools

Availability

Ex Stock
Cylindrical and flanged bushes in a variety of dimensions

To order
Non-standard parts

Machined Bronze Bearings
according to ISO 4379

Structure

Bearings made of copper alloys

CuSn12

Features

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

Possible Applications

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

Availability

To order:
Cylindrical bushes, flanged bushes, special parts according to DIN ISO or customer design, special alloys available

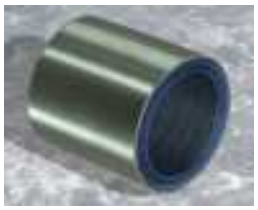
Bearing properties		Units	Value GAR-MAX	Value HSG
Maximum load $\bar{p}$	- static - dynamc	N/mm²	210 140	415 140
Maximum sliding speed U	- dry	m/s	0.13	0.13
Maximum $\bar{p}$U factor	- dry	N/mm² x m/s	1.05	1.05
Seal temperature limits	- continuous - intermittent	°C	+93 - 104	
Shaft surface finish Ra		µm	0.15 - 0.40	0.2 - 0.8
Shaft hardness - for service life >2000 hours	- normal	HB	>350 >480	>350 >480

SBC™ Sealed Bearing Cartridges

Usage

dry	**very good**
oil lubricated	**fair**
grease lubricated	**fair**
water lubricated	**fair**
process fluid lubricated	**fair**

Cylindrical bushes



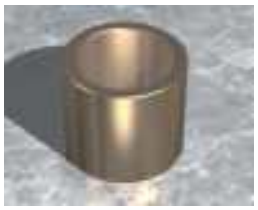
Cylindrical bushes with steel sleeves

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	10 5
Maximum sliding speed U	- oil impregnated	m/s	10.0
Maximum $\bar{p}$U factor	- oil impregnated	N/mm² x m/s	10.0
Maximium temperature T_{max}		°C	+90
Minimum temperature T_{min}		°C	- 5
Coefficient of friction f	- oil impregnated	-	0.08 - 0.12
Shaft surface finish Ra		µm	≤ 0.2
Shaft hardness		HB	>350

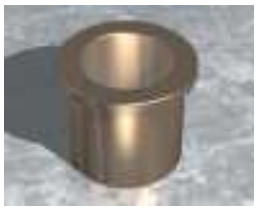
Sintered Bronze Bearings

Usage

dry	**good**
oil lubricated	**good**
grease lubricated	**fair**
water lubricated	**not suitable**
process fluid lubricated	**not suitable**



Cylindrical bushes



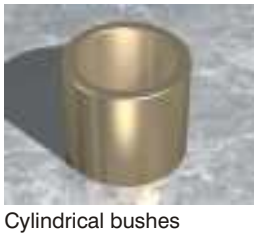
Flanged bushes

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static - dynamic	N/mm²	200 100
Maximum sliding speed U	- greased	m/s	2.5
Maximum $\bar{p}$U factor	- greased	N/mm² x m/s	2.8
Maximum temperature T_{max}		°C	+140
Minimum temperature T_{min}		°C	- 40
Coefficient of friction f	- greased	-	0.09 - 0.15
Shaft surface finish Ra		µm	0.2 - 0.8
Shaft hardness		HB	>350

Machined Bronze Bearings
according to ISO 4379

Usage

dry	**not suitable**
oil lubricated	**good**
grease lubricated	**good**
water lubricated	**not suitable**
process fluid lubricated	**not suitable**



Cylindrical bushes

Bushing Blocks

Structure

Housing material: Aluminium alloy
Assembled bearings see table on the right

Features

- Bearing housing with very good friction and wear performance
- Pre-installed GGB plain bearings

Possible Applications

Industrial and Automotive:
External gear pumps and motors

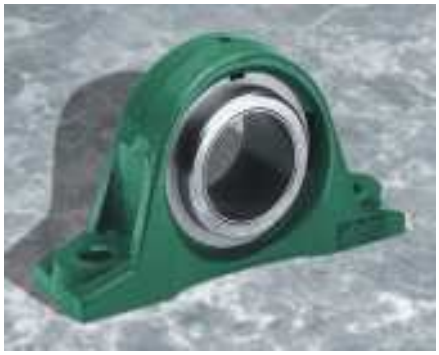
Availability

To order:
Customer design size and special shapes

EXALIGN™ Self-aligning Bearing Housings

Structure

Housing material: Cast iron
Spherical material: Cast iron
Corrosion-free and corrosion resistant models possible



Features

- 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 programme are applicable

Possible 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

Availability

To order:
Order-related production

UNI™ Self-aligning Bearing Housings

Structure

Housing material: GGG40
Spherical material: 16MnCr5
Corrosion resistant material possible

Features

- 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 programme are applicable

Possible 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

Availability

To order:
Order-related production

Bushing Block Material Composition

	Sical 6	Sical 3	Sical 3D
Sn	5 - 7 %	3 - 4 %	3 - 3.5 %
Cu	1.2 - 1.8 %	3 - 4 %	4.2 - 4.6 %
Si	-	<0.6 %	<0.6 %
Fe	-	<0.7 %	<0.7 %
Other	<1.5 %	<1.6 %	<1.6 %
Al	balance	balance	balance

Mechanical Properties

Property	Units	Sical 6	Sical 3	Sical 3D
Tensile strength	MPa	90	265	300
Ultimate tensile strength	MPa	160	335	350
Elongation	%	24	10	8
Brinell hardness	HB	45 - 70	85 - 110	100 - 135

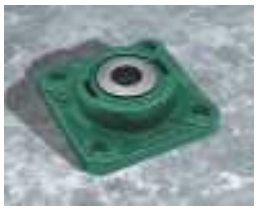
Bushing Blocks

Assembled Bearing Options

Material	Bearing Lining
DU	PTFE + Pb
DP4	PTFE + fillers
DP31	PTFE + fillers
DX	POM
HX	PEEK + PTFE + fillers

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	4250	3750
2	20 - 25	7700	5900
3	30	9500	8000
4	35 - 40	17000	11000
5	45	23000	12000
6	50	25000	14500
7	55 - 60	30000	16000
8	70 - 75	38000	17000
9	80 - 85	45500	27000
10	90 - 100	74500	30500

PB pedestal bearing housing



FL flange bearing housing

DF flange bearing housing

EXALIGN™ Self-aligning Bearing Housings

Load limit values for radial forces

Size	bush ID	max. pressure load [N] (housing)	max. tensile load [N] (bolt)	maximum shear off load [N] (bolt)
1	10 - 25	20000	10000	1000
2	28 - 40	30000	15000	1500
3	45 - 60	50000	25000	2500
4	65 - 80	90000	45000	4500
5	85 - 100	125000	62500	6000

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.

UNI™ Self-aligning Bearing Housings

MINI™ Self-aligning Bearing Housings

Structure

Housing material: **AlMgSi12**
Ball material: **9SMn28K**
Stainless and other materials possible

Features

- 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 programme are applicable

Possible 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

Availability

To order:
Order-related production

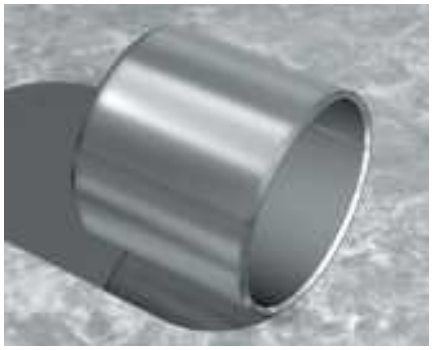
Notes:

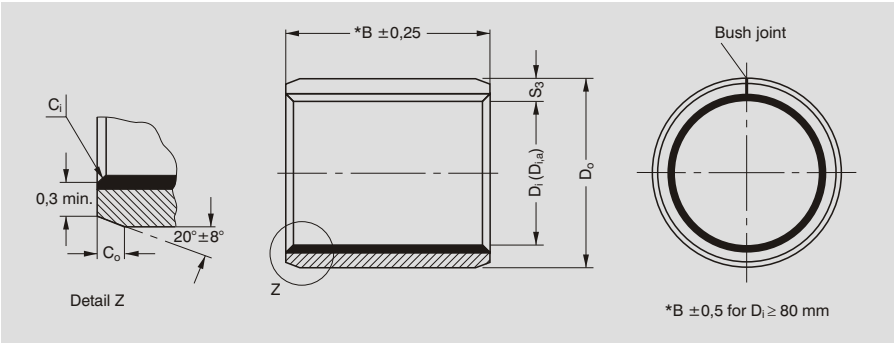
Load limit values for radial forces

Size	Bush ID	max. pressure load [N] (housing)	max. tensile load [N] (bolt)	maximum shear off load [N] (bolt)
0	8 - 15	10000	5000	500

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

DU® Bushes, cylindrical





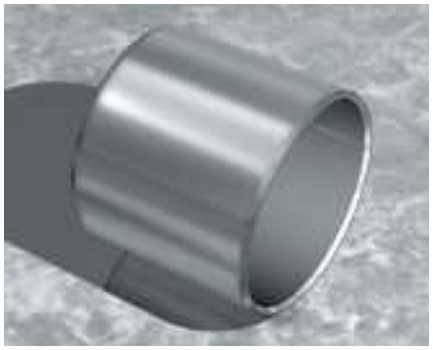
Dimensions [mm], tests and material in accordance with ISO 3547 and GGB specification

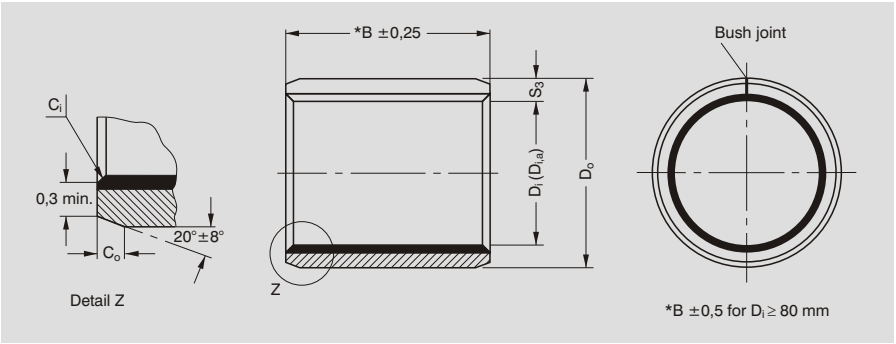
Part No.	Technical Data					
GGB	Dimensions			Weight	Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	g	Housing Journal	$D_{i,a}$
0203DU	2	3,5	3	0,1	H6/h6	+0,044 +0,004
0205DU	2	3,5	5	0,2		
0303DU	3	4,5	3	0,2		
0305DU	3	4,5	5	0,3		
0306DU	3	4,5	6	0,4		
0403DU	4	5,5	3	0,2		
0404DU	4	5,5	4	0,3		
0406DU	4	5,5	6	0,5		
0410DU	4	5,5	10	0,8		
0505DU	5	7	5	0,7	H7/f7	+0,048 - 0,002
0508DU	5	7	8	1,1		
0510DU	5	7	10	1,4		
0604DU	6	8	4	0,6		
0606DU	6	8	6	1,0		
0608DU	6	8	8	1,3		
0610DU	6	8	10	1,7		
0705DU	7	9	5	0,9		
0710DU	7	9	10	1,9		
0806DU	8	10	6	1,2		
0808DU	8	10	8	1,7		
0810DU	8	10	10	2,1		
0812DU	8	10	12	2,5		
1006DU	10	12	6	1,5		+0,049 - 0,001
1008DU	10	12	8	2,1		
1010DU	10	12	10	2,6		
1012DU	10	12	12	3,1		
1015DU	10	12	15	3,8		
1020DU	10	12	20	5,2		
1208DU	12	14	8	2,4		
1210DU	12	14	10	3,0		
1212DU	12	14	12	3,7		
1215DU	12	14	15	4,5		
1220DU	12	14	20	6,1		
1225DU	12	14	25	7,7		
1310DU	13	15	10	3,3		
1320DU	13	15	20	6,5		
1410DU	14	16	10	3,5		
1412DU	14	16	12	4,2		
1415DU	14	16	15	5,4		
1420DU	14	16	20	7,0		
1425DU	14	16	25	8,9		

Other dimensions, including inch sizes and intermediate sizes over 300 mm available on request.
$D_{i,a}$ = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for $D_i \leq 4$ mm.

Part No.	Technical Data					
GGB	Dimensions			Weight	Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	g	Housing Journal	$D_{i,a}$
1510DU	15	17	10	3,7	H7/f7	+0,049 - 0,001
1512DU	15	17	12	4,5		
1515DU	15	17	15	5,5		
1520DU	15	17	20	7,5		
1525DU	15	17	25	9,5		
1610DU	16	18	10	4,0		
1612DU	16	18	12	4,8		
1615DU	16	18	15	6,0		
1620DU	16	18	20	8,0		
1625DU	16	18	25	10,0		
1720DU	17	19	20	8,5		
1810DU	18	20	10	4,5		+0,051 +0,001
1815DU	18	20	15	6,8		
1820DU	18	20	20	8,7		
1825DU	18	20	25	11,3		
2010DU	20	23	10	7,5		+0,061 +0,001
2015DU	20	23	15	11,4		
2020DU	20	23	20	15,5		
2025DU	20	23	25	19,0		
2030DU	20	23	30	23,0		
2215DU	22	25	15	12,5		
2220DU	22	25	20	16,8		
2225DU	22	25	25	21,0		
2230DU	22	25	30	25,2		
2415DU	24	27	15	13,5		
2420DU	24	27	20	18,0		
2425DU	24	27	25	23,0		
2430DU	24	27	30	27,5		
2515DU	25	28	15	13,9		
2520DU	25	28	20	19,0		
2525DU	25	28	25	23,5		
2530DU	25	28	30	28,0		
2550DU	25	28	50	47,5		
2815DU	28	32	15	21,5		+0,073 +0,003
2820DU	28	32	20	29,0		
2825DU	28	32	25	37,0		
2830DU	28	32	30	44,0		
3010DU	30	34	10	15,5		
3015DU	30	34	15	22,9		
3020DU	30	34	20	30,5		
3025DU	30	34	25	38,6		
3030DU	30	34	30	46,0		
3040DU	30	34	40	62,5		
3220DU	32	36	20	32,5		
3230DU	32	36	30	49,0		
3240DU	32	36	40	65,3		

DU® Bushes, cylindrical





Dimensions [mm], tests and material in accordance with ISO 3547 and GGB specification

Part No.	Technical Data					
GGB	Dimensions			Weight	Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	g	Housing / Journal	$D_{i,a}$
3520DU	35	39	20	35,7	H7 / f7	+0,073 +0,003
3530DU	35	39	30	53,0		
3535DU	35	39	35	62,0		
3540DU	35	39	40	71,0		
3550DU	35	39	50	90,0		
3720DU	37	41	20	40,0		
4020DU	40	44	20	40,5		
4030DU	40	44	30	61,0		
4040DU	40	44	40	81,0		
4050DU	40	44	50	101,0		
4520DU	45	50	20	56,5		+0,093 +0,003
4530DU	45	50	30	85,0		
4540DU	45	50	40	115,0		
4545DU	45	50	45	130,0		
4550DU	45	50	50	143,5		
5020DU	50	55	20	62,0		+0,095 +0,005
5030DU	50	55	30	95,0		
5040DU	50	55	40	126,5		
5050DU	50	55	50	158,0		
5060DU	50	55	60	188,0		
5520DU	55	60	20	70,0		
5530DU	55	60	30	105,0		
5540DU	55	60	40	137,7		
5550DU	55	60	50	172,0		
5560DU	55	60	60	207,0		
6020DU	60	65	20	75,5		
6030DU	60	65	30	113,0		
6040DU	60	65	40	149,7		
6050DU	60	65	50	188,0		
6060DU	60	65	60	224,0		
6070DU	60	65	70	264,5		
6530DU	65	70	30	121,0		
6550DU	65	70	50	205,0		
6570DU	65	70	70	284,0		
7040DU	70	75	40	174,0		
7050DU	70	75	50	217,5		
7070DU	70	75	70	305,0		
7560DU	75	80	60	280,0		
7580DU	75	80	80	360,0		
8040DU	80	85	40	198,0	H7 / h8	+0,138 +0,038
8060DU	80	85	60	297,0		
8080DU	80	85	80	394,0		
80100DU	80	85	100	492,5		

Other dimensions, including inch sizes and intermediate sizes over 300 mm available on request.

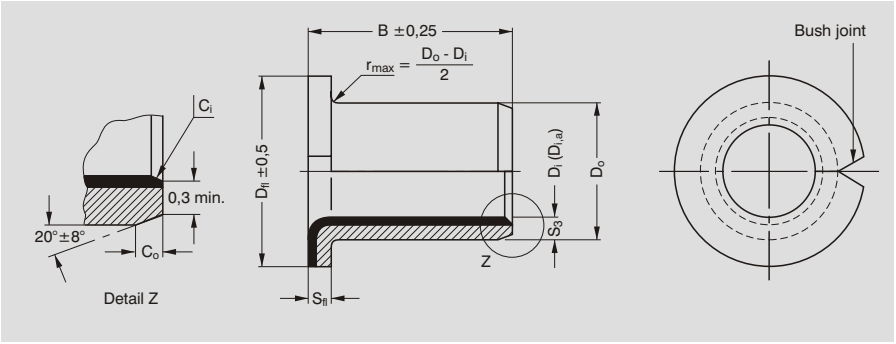
$D_{i,a}$ = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for $D_i \leq 4$ mm.

Part No.	Technical Data					
GGB	Dimensions			Weight	Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	g	Housing / Journal	$D_{i,a}$
8530DU	85	90	30	250,0	H7 / h8	+0,138 +0,038
8560DU	85	90	60	310,0		
85100DU	85	90	100	520,0		
9060DU	90	95	60	333,0		
90100DU	90	95	100	551,0		
9560DU	95	100	60	350,0		
95100DU	95	100	100	580,0		
10050DU	100	105	50	310,0		
10060DU	100	105	60	370,0		
100115DU	100	105	115	705,0		
10560DU	105	110	60	380,0		
105115DU	105	110	115	735,0		
11060DU	110	115	60	410,0		
110115DU	110	115	115	775,0		
11550DU	115	120	50	350		
11570DU	115	120	70	450		
12050DU	120	125	50	365		+0,190 +0,090
12060DU	120	125	60	435		
120100DU	120	125	100	730		
125100DU	125	130	100	755		
13060DU	130	135	60	470		
130100DU	130	135	100	780		
13560DU	135	140	60	480		
14060DU	140	145	60	500		
140100DU	140	145	100	840		
15060DU	150	155	60	535		
15080DU	150	155	80	720		
150100DU	150	155	100	895		
16080DU	160	165	80	765		
160100DU	160	165	100	960		
180100DU	180	185	100	1.075		+0,193 +0,093
200100DU	200	205	100	1.190		
210100DU	210	215	100	1.250		
220100DU	220	225	100	1.300		
250100DU	250	255	100	1.500		
300100DU	300	305	100	1.790		+0,196 +0,096

Inside and outside chamfers [in accordance with ISO 3547-1]

Inside Ø D_i [nominal dimension]	Wall thickness S_3 [nominal dimension]	Outside chamfer C_o	Inside chamfer C_i
2 - 4	0,75	0,5 ± 0,3	-0,1 to -0,4
5 - 18	1,0	0,6 ± 0,4	-0,1 to -0,5
20 - 25	1,5	0,6 ± 0,4	-0,1 to -0,7
28 - 40	2,0	1,1 ± 0,5	-0,1 to -0,7
45 - 300	2,5	1,6 ± 0,8	-0,2 to -1,0

DU® Flanged Bushes

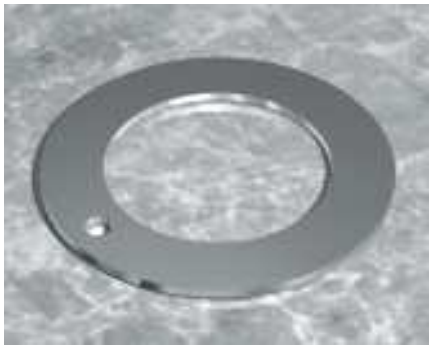


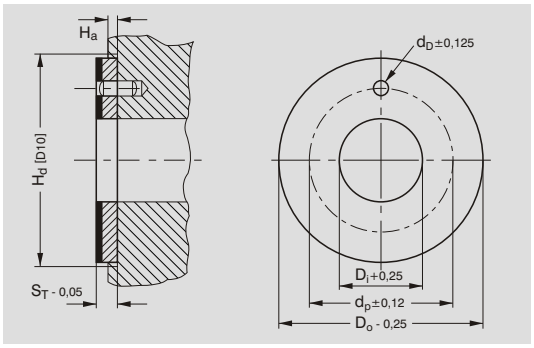
Dimensions [mm], tests and material in accordance with ISO 3547 and GGB specification.
Chamfer dimension: see table on page 38 bottom.

Part No.	Technical Data							
GGB	Dimensions					Installation tolerance		
	Inside Ø D_i	Outside Ø D_o	Flange Ø D_{fl}	Width B	Weight g	Housing / Journal	$D_{i,a}$	Flange thickn. S_{fl}
BB0304DU	3	4,5	7	4,0	0,3	H6 / h6	+0,044 +0,004	$0,75^{+0,05}_{-0,05}$
BB0404DU	4	5,5	9	4,0	0,5			
BB0505DU	5	7	10	5,0	0,7	H7 / f7	+0,048 -0,002	$1,0^{+0,05}_{-0,2}$
BB0604DU	6	8	12	4,0	1,0			
BB0608DU	6	8	12	8,0	1,7			
BB0806DU	8	10	15	5,5	1,7			
BB0808DU	8	10	15	7,5	2,1			
BB0810DU	8	10	15	9,5	2,5			
BB1007DU	10	12	18	7,0	2,6		+0,049 -0,001	
BB1009DU	10	12	18	9,0	3,1			
BB1012DU	10	12	18	12,0	3,8			
BB1017DU	10	12	18	17,0	5,4			
BB1207DU	12	14	20	7,0	3,1			
BB1209DU	12	14	20	9,0	3,7			
BB1212DU	12	14	20	12,0	4,6			
BB1217DU	12	14	20	17,0	6,2			
BB1412DU	14	16	22	12,0	5,2			
BB1417DU	14	16	22	17,0	7,1			
BB1509DU	15	17	23	9,0	4,5			
BB1512DU	15	17	23	12,0	6,0			
BB1517DU	15	17	23	17,0	8,0			
BB1612DU	16	18	24	12,0	6,0			
BB1617DU	16	18	24	17,0	8,5			
BB1812DU	18	20	26	12,0	6,5		+0,051 +0,001	
BB1817DU	18	20	26	17,0	9,0			
BB1822DU	18	20	26	22,0	11,0			
BB2012DU	20	23	30	11,5	11,0		+0,061 +0,001	$1,5^{+0,1}_{-0,2}$
BB2017DU	20	23	30	16,5	15,5			
BB2022DU	20	23	30	21,5	19,0			
BB2512DU	25	28	35	11,5	14,0			
BB2517DU	25	28	35	16,5	19,0			
BB2522DU	25	28	35	21,5	23,5			
BB3016DU	30	34	42	16,0	30,0		+0,073 +0,003	$2,0^{+0,1}_{-0,2}$
BB3026DU	30	34	42	26,0	46,0			
BB3516DU	35	39	47	16,0	35,0			
BB3526DU	35	39	47	26,0	52,5			
BB4016DU	40	44	53	16,0	40,0			
BB4026DU	40	44	53	26,0	60,0			
BB4516DU	45	50	58	16,0	56,0		+0,093 +0,003	$2,5^{+0,1}_{-0,2}$
BB4526DU	45	50	58	26,0	85,0			

Other dimensions available on request.
$D_{i,a}$ = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for $D_i \leq 4$ mm.
Extension of diameter range Di beyond 45 mm, see DU flanged thrust washers combined with cylindrical bushes.

DU® Thrust Washers





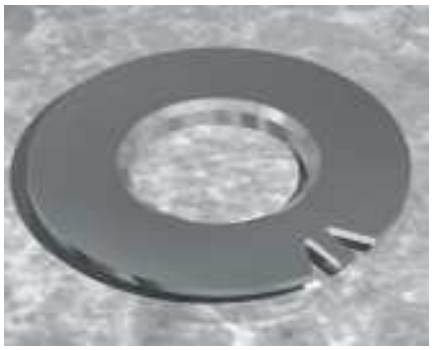
Delivery status:
Steel backing tin-plated

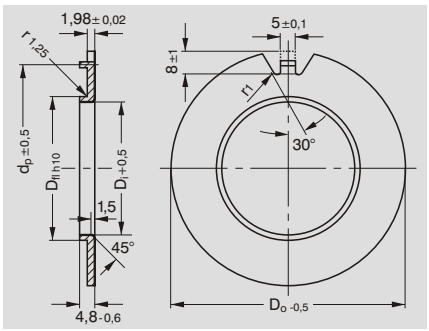
Part No.	Technical Data						
GGB	Dimensions						
	Inside Ø D_i	Outside Ø D_o	Thick-ness S_T	Dowel hole Ø d_D	Hole circle Ø d_p	Recess depth H_a	Weight g
WC08DU	10	20	1,5	-	-	0,95 to 1,20	2,5
WC10DU	12	24	1,5	1,75	18		3,6
WC12DU	14	26	1,5	2,25	20		4,0
WC14DU	16	30	1,5	2,25	22		5,6
WC16DU	18	32	1,5	2,25	25		5,9
WC18DU	20	36	1,5	3,25	28		7,6
WC20DU	22	38	1,5	3,25	30		8,2
WC22DU	24	42	1,5	3,25	33		9,5
WC24DU	26	44	1,5	3,25	35		10,8
WC25DU	28	48	1,5	4,25	38		12,9
WC30DU	32	54	1,5	4,25	43		16,4
WC35DU	38	62	1,5	4,25	50		20,6
WC40DU	42	66	1,5	4,25	54		22,5
WC45DU	48	74	2,0	4,25	61	1,45 to 1,70	37,1
WC50DU	52	78	2,0	4,25	65		39,5
WC60DU	62	90	2,0	4,25	76		50,0

Other dimensions available on request.

Note: On request also available in DUB, DP4B and in special sizes, also with dowel hole.

DU® Flanged Thrust Washers





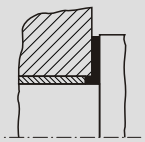
Delivery status: The retaining nose is punched, but not angled. The steel backing is bare and lightly oiled.

Part No.	Technical Data				
GGB	Dimensions				
	Inside Ø D_i	Flange Ø D_{fl}	Outside Ø D_o	Dowel hole Ø d_p	Weight g
BS40DU	40,2	44	75	65	48,0
BS50DU	51	55	85	75	55,0
BS60DU	61	65	95	85	65,0
BS70DU	71	75	110	100	85,0
BS80DU	81	85	120	110	95,0
BS90DU	91	95	130	120	105,0
BS100DU	101	105	140	130	115,0

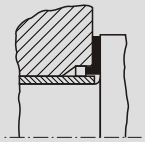
Other dimensions (also in DUB, DP4 and DP4B) available on request.

The many different possible applications for flanged thrust washers

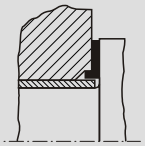
- Outside diameter up to 245 mm
- One flanged thrust washer for two different nominal bush diameters
- No retaining pin required, locking device by means of punched retaining nose
- 100% load-bearing capacity on the flanged surface
- Abrasion ejection through hole punched in the retaining nose
- Combination with other bearing materials (roller bearings, sintered bearings etc.)



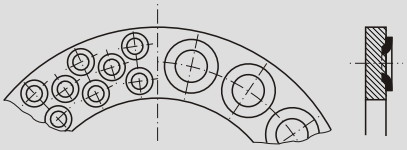
Cylindrical part in same hole with bush



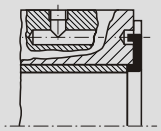
Cylindrical part freely rotating in housing bore



Cylindrical part in chamfer in housing bore

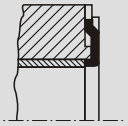


Combination of straight guideways and large thrust washers



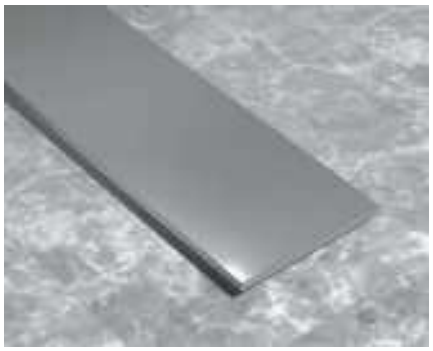
Locking device (nose) in drilled hole

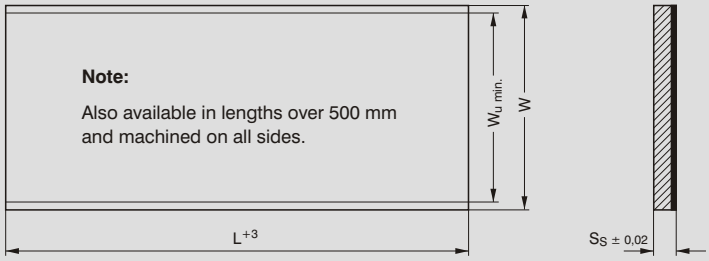
Axial fixation (also with 2 noses)



Locking device, nose in groove in thin-walled housings

DU® Plates

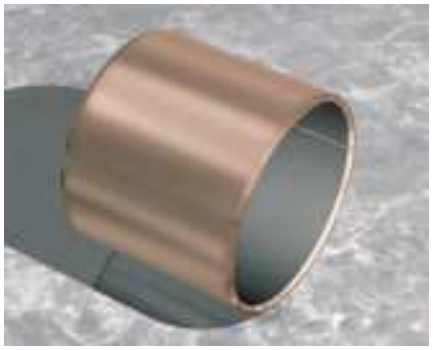


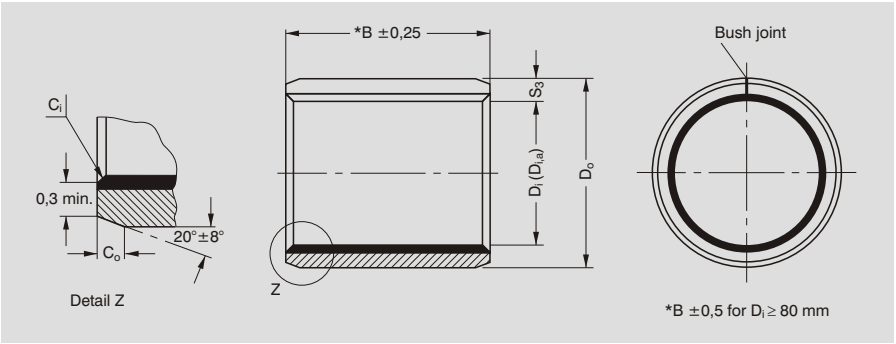


Part No.	Technical Data				
GGB	Dimensions				
	Length L	Total width W	Usable width $W_{u\ min.}$	Thickness S_S	Weight g
S07190DU	500	200	190	0,72	544,0
S10190DU	500	200	190	0,99	690,0
S15240DU	500	254	240	1,50	1450,0
S20240DU	500	254	240	1,98	1940,0
S25240DU	500	254	240	2,48	2440,0
S30240DU	500	254	240	3,04	2980,0

Other dimensions available on request (also in 0.5 mm thickness).
DU plates are delivered without electroplating (Cu) on the steel backing (except: **S 07190 DU**).

DU®B Bushes, cylindrical — with bronze backing





Dimensions [mm], tests and material in accordance with ISO 3547 and GGB specification

Part No.	Technical Data					
GGB	Dimensions			Weight	Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	g	Housing / Journal	$D_{i,a}$
0203DUB	2	3,5	3	0,2	H6 / h6	+0,044 +0,004
0205DUB	2	3,5	5	0,3		
0306DUB	3	4,5	6	0,5		
0404DUB	4	5,5	4	0,3		
0406DUB	4	5,5	6	0,5		
0505DUB	5	7	5	0,8	H7 / f7	+0,048 -0,002
0510DUB	5	7	10	1,5		
0606DUB	6	8	6	1,1		
0610DUB	6	8	10	1,8		
0808DUB	8	10	8	1,8		
0810DUB	8	10	10	2,3		
0812DUB	8	10	12	2,7		
1010DUB	10	12	10	2,7		+0,049 -0,001
1015DUB	10	12	15	4,1		
1208DUB	12	14	8	2,5		
1210DUB	12	14	10	3,2		
1212DUB	12	14	12	3,9		
1215DUB	12	14	15	5,0		
1410DUB	14	16	10	3,7		
1415DUB	14	16	15	5,6		
1420DUB	14	16	20	7,5		
1515DUB	15	17	15	6,0		
1525DUB	15	17	25	10,0		
1615DUB	16	18	15	6,5		
1625DUB	16	18	25	10,5		
1820DUB	18	20	20	9,5		+0,031 +0,001
1825DUB	18	20	25	12,0		
2015DUB	20	23	15	12,3		+0,061 +0,001
2020DUB	20	23	20	16,5		
2030DUB	20	23	30	25,0		
2215DUB	22	25	15	13,5		
2220DUB	22	25	20	18,0		
2225DUB	22	25	25	23,0		
2515DUB	25	28	15	15,0		
2525DUB	25	28	25	25,5		
2830DUB	28	32	30	48,0		+0,073 +0,003
3020DUB	30	34	20	33,0		
3030DUB	30	34	30	50,0		
3040DUB	30	34	40	67,0		
3240DUB	32	36	40	72,0		

Part No.	Technical Data					
GGB	Dimensions			Weight	Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	g	Housing / Journal	$D_{i,a}$
3520DUB	35	39	20	39,0	H7 / f7	+0,073 +0,003
3530DUB	35	39	30	58,5		
4030DUB	40	44	30	66,5		
4050DUB	40	44	50	118,6		
4530DUB	45	50	30	95,0		+0,093 +0,003
4550DUB	45	50	50	155,0		
5040DUB	50	55	40	140,0		+0,095 +0,005
5060DUB	50	55	60	210,0		
5540DUB	55	60	40	155,0		
6040DUB	60	65	40	168,0		
6050DUB	60	65	50	208,0		
6060DUB	60	65	60	249,0		
6070DUB	60	65	70	290,0		
6570DUB	65	70	70	282,0		
7050DUB	70	75	50	245,0		
7070DUB	70	75	70	342,0		
7580DUB	75	80	80	368,0		
8060DUB	80	85	60	325,0	H7 / h8	+0,138 +0,038
80100DUB	80	85	100	550,0		
85100DUB	85	90	100	523,0		
9060DUB	90	95	60	365,0		
90100DUB	90	95	100	615,0		
95100DUB	95	100	100	583,0		
10060DUB	100	105	60	410,0		
100115DUB	100	105	115	785,0		
105115DUB	105	110	115	737,0		
110115DUB	110	115	115	772,0		

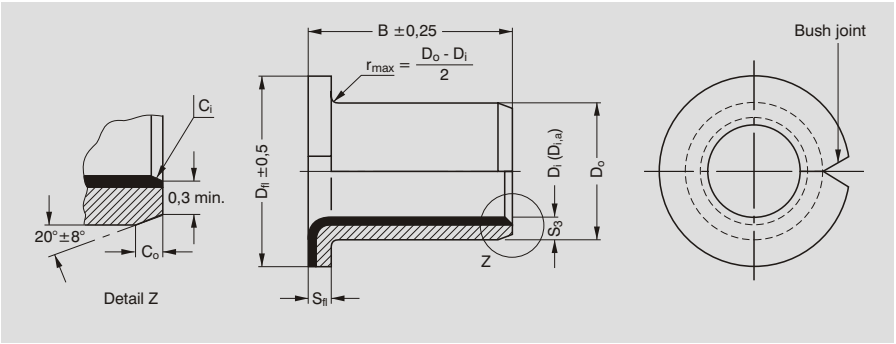
Other dimensions, including inch sizes and intermediate sizes over 300 mm available on request.

$D_{i,a}$ = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for $D_i \leq 4$ mm.

Inside and outside chamfers [in accordance with ISO 3547-1]

Inside Ø D_i [nominal dimension]	Wall thickness S_3 [nominal dimension]	Outside chamfer C_o	Inside chamfer C_i
2 - 4	0,75	0,5 ± 0,3	-0,1 to -0,4
5 - 18	1,0	0,6 ± 0,4	-0,1 to -0,5
20 - 25	1,5	0,6 ± 0,4	-0,1 to -0,7
28 - 40	2,0	1,1 ± 0,5	-0,1 to -0,7
45 - 300	2,5	1,6 ± 0,8	-0,2 to -1,0

DU®B Flanged Bushes — with bronze backing



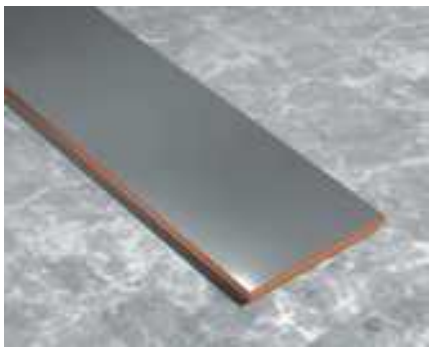
Dimensions [mm], tests and material in accordance with ISO 3547 and GGB specification

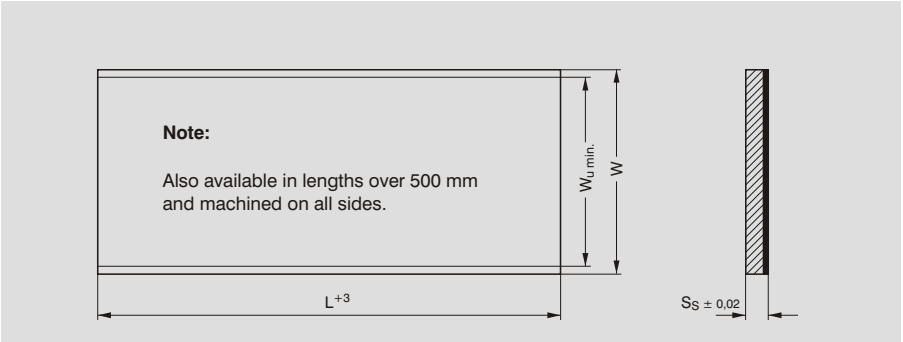
Part No.	Technical Data							
GGB	Dimensions					Installation tolerance		
	Inside Ø D_i	Outside Ø D_o	Flange Ø D_{fl}	Width B	Weight g	Housing / Journal	$D_{i,a}$	Flange thickn. S_{fl}
BB0304DUB	3	4,5	7	4,0	0,3	H6 / h6	+0,044 +0,004	0,75 +0,05 -0,05
BB0404DUB	4	5,5	9	4,0	0,5			
BB0505DUB	5	7	10	5,0	0,7	H7 / f7	+0,048 - 0,002	1,0 +0,05 - 0,2
BB0608DUB	6	8	12	8,0	1,7			
BB0806DUB	8	10	15	5,5	1,8			
BB0810DUB	8	10	15	9,5	2,8			
BB1007DUB	10	12	18	7,0	2,7		+0,049 - 0,001	
BB1012DUB	10	12	18	12,0	4,1			
BB1207DUB	12	14	20	7,0	3,2			
BB1209DUB	12	14	20	9,0	3,8			
BB1212DUB	12	14	20	12,0	5,0			
BB1417DUB	14	16	22	17,0	7,5			
BB1512DUB	15	17	23	12,0	6,0			
BB1517DUB	15	17	23	17,0	8,0			

Part No.	Technical Data							
GGB	Dimensions					Installation tolerance		
	Inside Ø D_i	Outside Ø D_o	Flange Ø D_{fl}	Width B	Weight g	Housing / Journal	$D_{i,a}$	Flange thickn. S_{fl}
BB1612DUB	16	18	24	12,0	6,5	H7 / f7	+0,049 +0,001	1,0 +0,05 - 0,2
BB1617DUB	16	18	24	17,0	8,5			
BB1812DUB	18	20	26	12,0	7,0		+0,051 +0,001	
BB1822DUB	18	20	26	22,0	11,9			
BB2012DUB	20	23	30	11,5	12,2		+0,061 +0,001	1,5 +0,1 - 0,2
BB2017DUB	20	23	30	16,5	16,5			
BB2512DUB	25	28	35	11,5	15,0			
BB2522DUB	25	28	35	21,5	25,0			
BB3016DUB	30	34	42	16,0	34,0		+0,073 +0,003	2,0 +0,1 - 0,2
BB3026DUB	30	34	42	26,0	50,0			
BB3526DUB	35	39	47	26,0	58,0			
BB4026DUB	40	44	53	26,0	66,0			
BB4526DUB	45	50	58	26,0	95,0		+0,093 +0,003	2,5 +0,1 - 0,2

Other dimensions available on request.
$D_{i,a}$ = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for $D_i \leq 4$ mm.
Extension of diameter range to more than 45 mm, see DU flanged thrust washers.
Cracks in the flange diameter are permissible with $D_i \leq 4$ mm.

DU®B Plates — with bronze backing



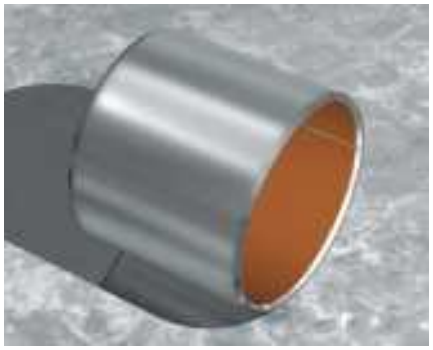


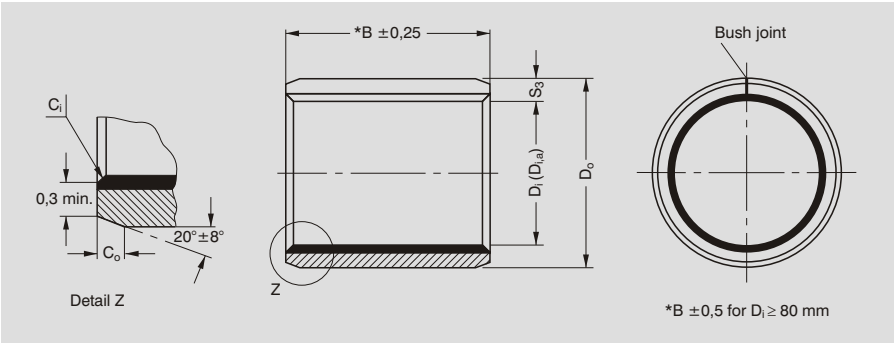
Punched and moulded parts on request.

Part No.	Technical Data				
GGB	Dimensions				
	Length L	Total width W	Usable width $W_{u\,min.}$	Thickness S_S	Weight g
S07085DUB	500	95	85	0,72	290,0
S10180DUB	500	193	180	0,99	770,0
S15180DUB	500	193	180	1,50	1200,0
S20180DUB	500	193	180	1,98	1620,0
S25180DUB	500	193	180	2,48	2060,0

Other dimensions available on request.

DP4™ Bushes, cylindrical





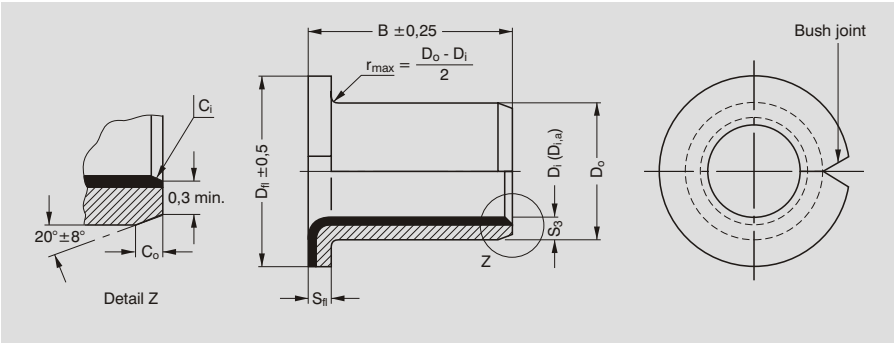
Dimensions [mm], tests and material in accordance with ISO 3547 and GGB specification

Part No.	Technical Data					
GGB	Dimensions			Weight	Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	g	Housing / Journal	$D_{i,a}$
0203DP4	2	3,5	3	0,1	H6 / h6	+0,044 +0,004
0303DP4	3	4,5	3	0,2		
0305DP4	3	4,5	5	0,3		
0306DP4	3	4,5	6	0,4		
0404DP4	4	5,5	4	0,3		
0406DP4	4	5,5	6	0,5		
0410DP4	4	5,5	10	0,8		
0505DP4	5	7	5	0,7	H7 / f7	+0,048 - 0,002
0510DP4	5	7	10	1,3		
0606DP4	6	8	6	0,9		
0608DP4	6	8	8	1,2		
0610DP4	6	8	10	1,6		
0710DP4	7	9	10	1,8		
0806DP4	8	10	6	1,0		
0808DP4	8	10	8	1,6		
0810DP4	8	10	10	2,0		
0812DP4	8	10	12	2,4		
1008DP4	10	12	8	2,0		+0,049 - 0,001
1010DP4	10	12	10	2,5		
1015DP4	10	12	15	3,7		
1020DP4	10	12	20	5,2		
1208DP4	12	14	8	2,3		
1210DP4	12	14	10	2,8		
1212DP4	12	14	12	3,3		
1215DP4	12	14	15	4,3		
1220DP4	12	14	20	6,0		
1225DP4	12	14	25	7,6		
1410DP4	14	16	10	3,4		
1415DP4	14	16	15	5,3		
1420DP4	14	16	20	6,9		
1425DP4	14	16	25	8,8		
1510DP4	15	17	10	3,6		
1515DP4	15	17	15	5,4		
1525DP4	15	17	25	9,4		
1610DP4	16	18	10	3,9		
1612DP4	16	18	12	4,6		
1615DP4	16	18	15	5,9		
1620DP4	16	18	20	8,0		
1625DP4	16	18	25	9,9		
1815DP4	18	20	15	6,7		+0,051 +0,001
1820DP4	18	20	20	8,5		
1825DP4	18	20	25	11,0		

Part No.	Technical Data					
GGB	Dimensions			Weight	Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	g	Housing / Journal	$D_{i,a}$
2010DP4	20	23	10	7,4	H7 / f7	+0,061 +0,001
2015DP4	20	23	15	11,1		
2020DP4	20	23	20	15,1		
2025DP4	20	23	25	18,0		
2030DP4	20	23	30	22,6		
2215DP4	22	25	15	12,0		
2220DP4	22	25	20	16,6		
2230DP4	22	25	30	24,2		
2415DP4	24	27	15	13,0		
2430DP4	24	27	30	26,0		
2515DP4	25	28	15	14,0		
2525DP4	25	28	25	23,0		
2830DP4	28	32	30	43,5		+0,073 +0,003
3020DP4	30	34	20	30,0		
3030DP4	30	34	30	45,5		
3040DP4	30	34	40	62,0		
3240DP4	32	36	40	65,0		
3520DP4	35	39	20	35,0		
3530DP4	35	39	30	52,7		
3550DP4	35	39	50	89,0		
4020DP4	40	44	20	40,0		
4030DP4	40	44	30	60,0		
4050DP4	40	44	50	100,0		
4530DP4	45	50	30	84,0		+0,093 +0,003
4550DP4	45	50	50	143,0		
5040DP4	50	55	40	125,0		+0,095 +0,005
5060DP4	50	55	60	185,0		
5540DP4	55	60	40	135,5		
6040DP4	60	65	40	148,5		
6070DP4	60	65	70	263,0		
6570DP4	65	70	70	283,0		
7070DP4	70	75	70	303,0		
7580DP4	75	80	80	359,0		
8060DP4	80	85	60	295,0	H7 / h8	+0,138 +0,038
8080DP4	80	85	80	395,0		
80100DP4	80	85	100	490,0		
85100DP4	85	90	100	518,0		
90100DP4	90	95	100	548,0		
95100DP4	95	100	100	578,0		
100115DP4	100	105	115	700,0		

Other dimensions available on request.
$D_{i,a}$ = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for $D_i \leq 4$ mm.

DP4™ Flanged Bushes

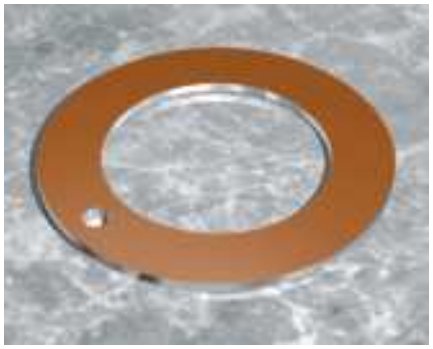


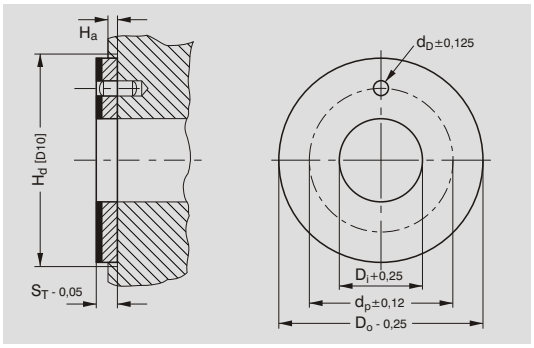
Dimensions [mm], tests and material in accordance with ISO 3547 and GGB specification

Part No.	Technical Data							
GGB	Dimensions					Installation tolerance		
	Inside Ø D_i	Outside Ø D_o	Flange Ø D_{fl}	Width B	Weight g	Housing / Journal	$D_{i,a}$	Flange thickn. S_{fl}
BB0304DP4	3	4,5	7	4,0	0,3	H6 / h6	+0,044 +0,004	$0,75^{+0,05}_{-0,05}$
BB0404DP4	4	5,5	9	4,0	0,5			
BB0505DP4	5	7	10	5,0	0,7	H7 / f7	+0,048 -0,002	$1,0^{+0,05}_{-0,2}$
BB0604DP4	6	8	12	4,0	1,0			
BB0608DP4	6	8	12	8,0	1,6			
BB0806DP4	8	10	15	5,5	1,6			
BB0810DP4	8	10	15	9,5	2,4			
BB1007DP4	10	12	18	7,0	2,5		+0,049 -0,001	
BB1009DP4	10	12	18	9,0	3,0			
BB1012DP4	10	12	18	12,0	3,7			
BB1207DP4	12	14	20	7,0	3,0			
BB1209DP4	12	14	20	9,0	3,6			
BB1212DP4	12	14	20	12,0	4,5			
BB1217DP4	12	14	20	17,0	5,2			
BB1412DP4	14	16	22	12,0	5,1			
BB1417DP4	14	16	22	17,0	7,0			
BB1512DP4	15	17	23	12,0	5,8			
BB1517DP4	15	17	23	17,0	7,7			
BB1612DP4	16	18	24	12,0	5,8			
BB1617DP4	16	18	24	17,0	8,3			
BB1822DP4	18	20	26	22,0	10,8		+0,051 +0,001	
BB2012DP4	20	23	30	11,5	10,7		+0,061 +0,001	$1,5^{+0,1}_{-0,2}$
BB2017DP4	20	23	30	16,5	15,2			
BB2512DP4	25	28	35	11,5	13,0			
BB2522DP4	25	28	35	21,5	23,0			
BB3016DP4	30	34	42	16,0	29,5		+0,073 +0,003	$2,0^{+0,1}_{-0,2}$
BB3026DP4	30	34	42	26,0	45,5			
BB3526DP4	35	39	47	26,0	52,0			
BB4026DP4	40	44	53	26,0	55,5			
BB4526DP4	45	50	58	26,0	80,0		+0,093 +0,003	$2,5^{+0,1}_{-0,2}$

Other dimensions on request.
$D_{i,a}$ = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for $D_i \leq 4$ mm.
Extension of diameter range to more than 45 mm, see DU flanged thrust washers.

DP4™ Thrust Washers

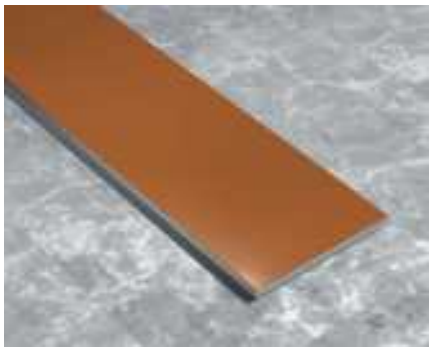


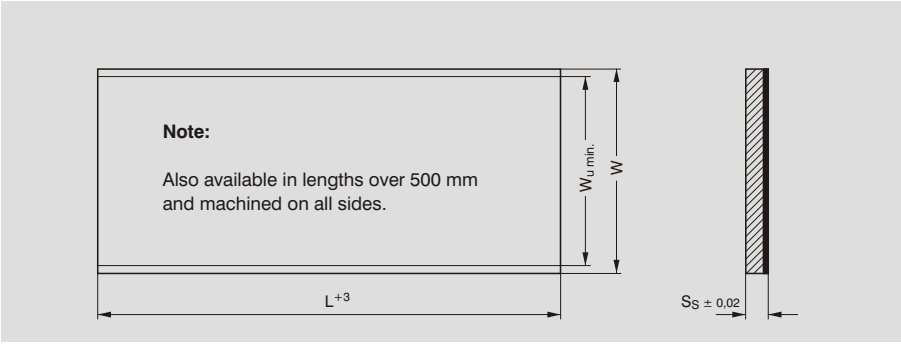


Part No.	Technical Data						
GGB	Dimensions						
	Inside Ø D_i	Outside Ø D_o	Thick-ness S_T	Dowel hole Ø d_D	Hole circle Ø d_p	Recess depth H_a	Weight g
WC08DP4	10	20	1,5	-	-	0,95 bis 1,20	2,5
WC10DP4	12	24	1,5	1,75	18		3,6
WC12DP4	14	26	1,5	2,25	20		4,0
WC14DP4	16	30	1,5	2,25	22		5,6
WC16DP4	18	32	1,5	2,25	25		5,9
WC18DP4	20	36	1,5	3,25	28		7,6
WC20DP4	22	38	1,5	3,25	30		8,2
WC22DP4	24	42	1,5	3,25	33		9,5
WC24DP4	26	44	1,5	3,25	35		10,8
WC25DP4	28	48	1,5	4,25	38		12,9
WC30DP4	32	54	1,5	4,25	43		16,4
WC35DP4	38	62	1,5	4,25	50		20,6
WC40DP4	42	66	1,5	4,25	54		22,5
WC45DP4	48	74	2,0	4,25	61	1,45 bis 1,70	37,1
WC50DP4	52	78	2,0	4,25	65		39,5
WC60DP4	62	90	2,0	4,25	76		50,0

Other dimensions available on request.

DP4™ Plates



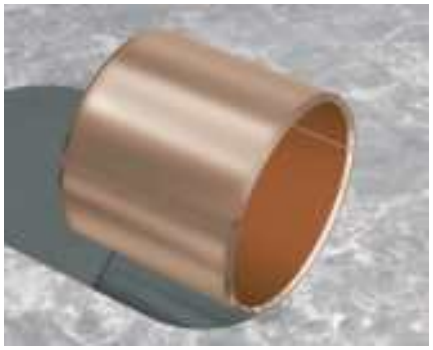


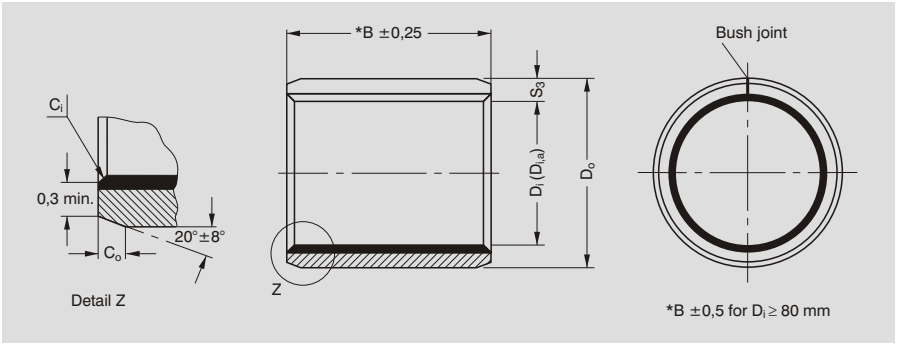
Punched and moulded parts on request.

Part No.	Technical Data				
GGB	Dimensions				
	Length L	Total width W	Usable width $W_{u\ min.}$	Thickness S_S	Weight g
S07190DP4	500	200	190	0,72	712,0
S10190DP4	500	200	190	0,99	730,0
S15190DP4	500	200	190	1,50	1130,0
S20190DP4	500	200	190	1,96	1500,0
S25240DP4	500	254	240	2,44	2440,0

Other dimensions available on request.
DP4 plates are delivered with electroplating (Cu) on the steel backing (except: **S10190DP4**).
Material thickness 3.05 mm available on request.

DP4B™ Bushes, cylindrical with bronze backing





Dimensions [mm], tests and material in accordance with ISO 3547 and GGB specification

Part No.	Technical Data					
GGB	Dimensions				Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	Weight g	Housing / Journal	$D_{i,a}$
0203DP4B	2	3,5	3	0,2	H6 / h6	+0,044 +0,004
0306DP4B	3	4,5	6	0,5		
0404DP4B	4	5,5	4	0,3		
0406DP4B	4	5,5	6	0,5		
0505DP4B	5	7	5	0,8	H7 / f7	+0,048 - 0,002
0510DP4B	5	7	10	1,5		
0606DP4B	6	8	6	1,1		
0610DP4B	6	8	10	1,8		
0808DP4B	8	10	8	1,8		
0810DP4B	8	10	10	2,3		
0812DP4B	8	10	12	2,7		
1010DP4B	10	12	10	2,7		+0,049 - 0,001
1015DP4B	10	12	15	4,1		
1208DP4B	12	14	8	2,5		
1210DP4B	12	14	10	3,2		
1212DP4B	12	14	12	3,9		
1215DP4B	12	14	15	5,0		
1410DP4B	14	16	10	3,7		
1415DP4B	14	16	15	5,6		
1420DP4B	14	16	20	7,5		
1515DP4B	15	17	15	6,0		
1525DP4B	15	17	25	10,0		
1615DP4B	16	18	15	6,5		
1625DP4B	16	18	25	10,5		
1820DP4B	18	20	20	9,5		+0,031 +0,001
1825DP4B	18	20	25	12,0		
2015DP4B	20	23	15	12,3		+0,061 +0,001
2020DP4B	20	23	20	16,5		
2030DP4B	20	23	30	25,0		
2215DP4B	22	25	15	13,5		
2220DP4B	22	25	20	18,0		
2515DP4B	25	28	15	15,0		
2525DP4B	25	28	25	25,5		
2830DP4B	28	32	30	48,0		+0,073 +0,003
3020DP4B	30	34	20	33,0		
3030DP4B	30	34	30	50,0		
3040DP4B	30	34	40	67,0		
3240DP4B	32	36	40	72,0		

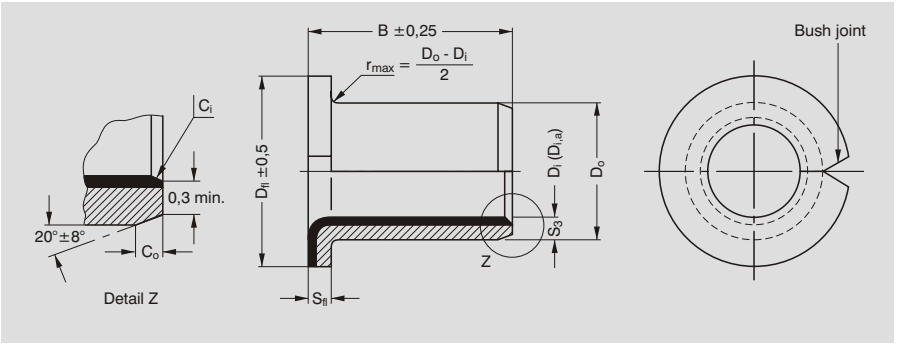
Part No.	Technical Data					
GGB	Dimensions				Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	Weight g	Housing / Journal	$D_{i,a}$
3520DP4B	35	39	20	39,0	H7 / f7	+0,073 +0,003
3530DP4B	35	39	30	58,5		
4030DP4B	40	44	30	66,5		
4050DP4B	40	44	50	118,6		
4530DP4B	45	50	30	95,0		+0,093 +0,003
4550DP4B	45	50	50	155,0		
5040DP4B	50	55	40	140,0		+0,095 +0,005
5060DP4B	50	55	60	210,0		
5540DP4B	55	60	40	155,0		
6040DP4B	60	65	40	168,0		
6070DP4B	60	65	70	290,0		
6570DP4B	65	70	70	282,0		
7070DP4B	70	75	70	342,0		
7580DP4B	75	80	80	368,0		
8060DP4B	80	85	60	325,0	H7 / h8	+0,138 +0,038
80100DP4B	80	85	100	550,0		
85100DP4B	85	90	100	523,0		
90100DP4B	90	95	100	615,0		
95100DP4B	95	100	100	583,0		
100115DP4B	100	105	115	785,0		

Other dimensions available on request.
$D_{i,a}$ = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for $D_i \leq 4$ mm.

Inside and outside chamfers [in accordance with ISO 3547-1]

Inside Ø D_i [nominal dimension]	Wall thickness S_3 [nominal dimension]	Outside chamfer C_o	Inside chamfer C_i
2 - 4	0,75	0,5 ± 0,3	-0,1 to -0,4
5 - 18	1,0	0,6 ± 0,4	-0,1 to -0,5
20 - 25	1,5	0,6 ± 0,4	-0,1 to -0,7
28 - 40	2,0	1,1 ± 0,5	-0,1 to -0,7
45 - 300	2,5	1,6 ± 0,8	-0,2 to -1,0

DP4B™ Flanged Bushes — with bronze backing



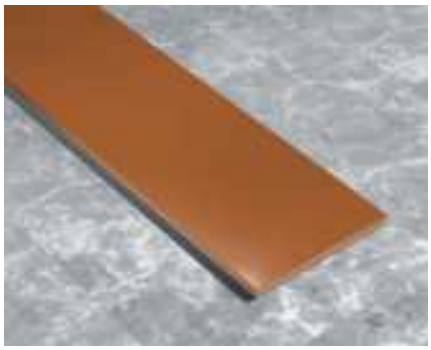
Dimensions [mm], tests and material in accordance with ISO 3547 and GGB specification

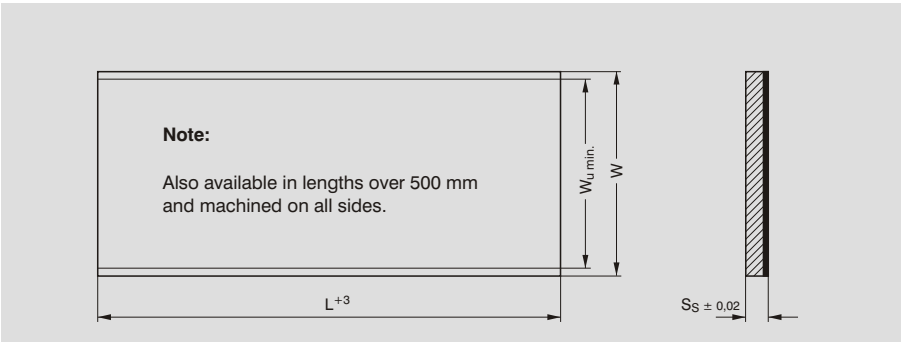
Part No.	Technical Data							
GGB	Dimensions					Installation tolerance		
	Inside Ø D_i	Outside Ø D_o	Flange Ø D_{fl}	Width B	Weight g	Housing / Journal	$D_{i,a}$	
BB0304DP4B	3	4,5	7	4,0	0,3	H6	+0,044 +0,004	$0,75^{+0,05}_{-0,05}$
BB0404DP4B	4	5,5	9	4,0	0,5	h6		
BB0505DP4B	5	7	10	5,0	0,7	H7	+0,048 - 0,002	$1,0^{+0,05}_{-0,2}$
BB0608DP4B	6	8	12	8,0	1,7	f7		
BB0806DP4B	8	10	15	5,5	1,8			
BB0810DP4B	8	10	15	9,5	2,8			
BB1007DP4B	10	12	18	7,0	2,7		+0,049 - 0,001	
BB1012DP4B	10	12	18	12,0	4,1			
BB1207DP4B	12	14	20	7,0	3,2			
BB1209DP4B	12	14	20	9,0	3,8			
BB1212DP4B	12	14	20	12,0	5,0			
BB1417DP4B	14	16	22	17,0	7,5			
BB1512DP4B	15	17	23	12,0	6,0			
BB1517DP4B	15	17	23	17,0	8,0			

Part No.	Technical Data							
GGB	Dimensions					Installation tolerance		
	Inside Ø D_i	Outside Ø D_o	Flange Ø D_{fl}	Width B	Weight g	Housing / Journal	$D_{i,a}$	Flange thickn. S_{fl}
BB1612DP4B	16	18	24	12,0	6,5	H7 / f7	+0,049 +0,001	$1,0^{+0,05}_{-0,2}$
BB1617DP4B	16	18	24	17,0	8,5			
BB1812DP4B	18	20	26	12,0	7,0		+0,051 +0,001	
BB1822DP4B	18	20	26	22,0	11,9			
BB2012DP4B	20	23	30	11,5	12,2		+0,061 +0,001	$1,5^{+0,1}_{-0,2}$
BB2017DP4B	20	23	30	16,5	16,5			
BB2512DP4B	25	28	35	11,5	15,0			
BB2522DP4B	25	28	35	21,5	25,0			
BB3016DP4B	30	34	42	16,0	34,0		+0,073 +0,003	$2,0^{+0,1}_{-0,2}$
BB3026DP4B	30	34	42	26,0	50,0			
BB3526DP4B	35	39	47	26,0	58,0			
BB4026DP4B	40	44	53	26,0	66,0			
BB4526DP4B	45	50	58	26,0	95,0		+0,093 +0,003	$2,5^{+0,1}_{-0,2}$

Other dimensions available on request.
$D_{i,a}$ = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for $D_i \leq 4$ mm.
Extension of diameter range to more than 45 mm, see DU flanged thrust washers.
Cracks in the flange diameter are permissible with $D_i \leq 4$ mm.

DP4B™ Plates — with bronze backing



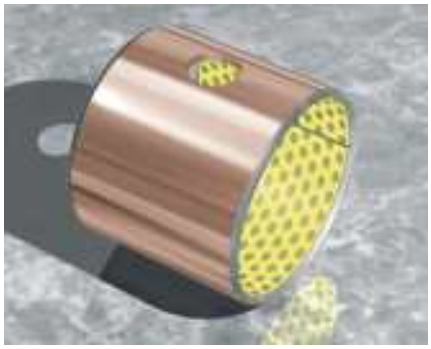


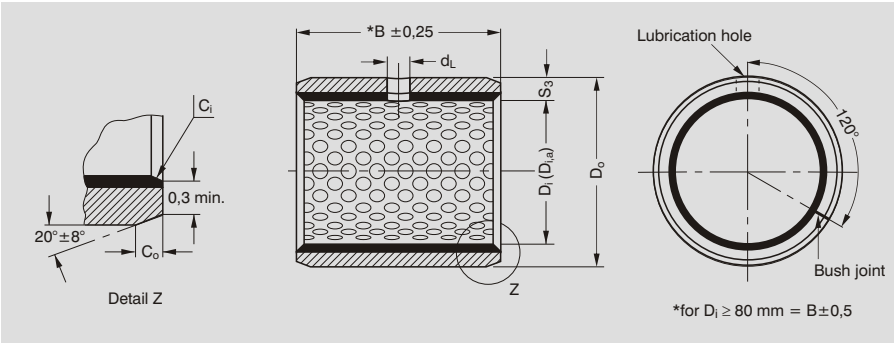
Punched and moulded parts on request.

Part No.	Technical Data				
GGB	Dimensions				
	Length L	Total width W	Usable width $W_{u\,min.}$	Thickness S_S	Weight g
S07085DP4B	500	95	85	0,72	290,0
S10180DP4B	500	193	180	0,99	770,0
S15180DP4B	500	193	180	1,50	1200,0
S20180DP4B	500	193	180	1,96	1620,0
S25180DP4B	500	193	180	2,44	2060,0

Other dimensions available on request.

PM DX® Bushes, cylindrical (PM=prefinished)





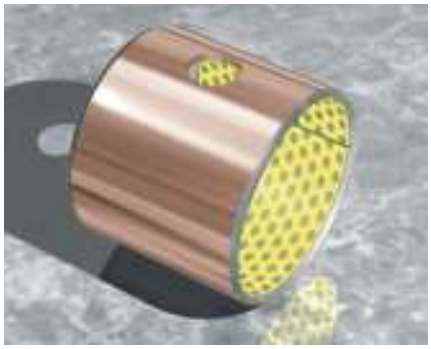
Dimensions [mm], tests and material in accordance with ISO 3547 and GGB specification

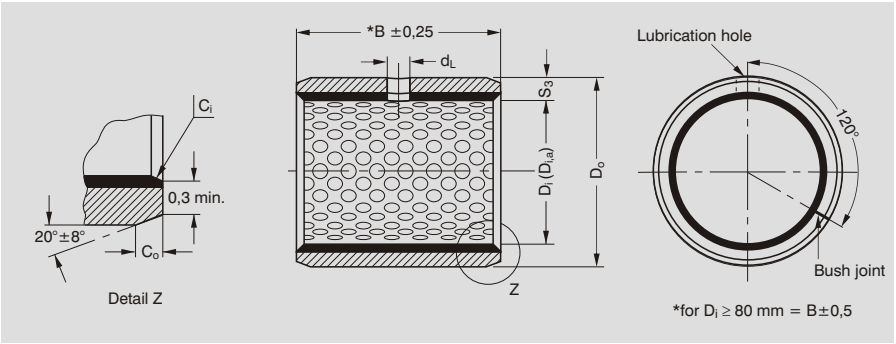
Part No.	Technical Data						
GGB	Dimensions					Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	Lubrication hole Ø d_L	Weight g	Housing / Journal	$D_{i,a}$
PM0808DX	8	10	8	-	1,2	H7 / h8	+0,098 +0,048
PM0810DX	8	10	10	-	1,5		
PM0812DX	8	10	12	-	1,8		
PM1010DX	10	12	10	3	1,9		+0,099 +0,049
PM1012DX	10	12	12	4	2,2		
PM1015DX	10	12	15	4	2,7		
PM1020DX	10	12	20	4	3,5		
PM1210DX	12	14	10	3	2,1		
PM1212DX	12	14	12	4	2,5		
PM1215DX	12	14	15	4	3,3		
PM1220DX	12	14	20	4	4,4		
PM1225DX	12	14	25	4	5,7		
PM1415DX	14	16	15	4	3,7		
PM1420DX	14	16	20	4	4,9		
PM1425DX	14	16	25	4	6,3		
PM1510DX	15	17	10	3	2,7		
PM1512DX	15	17	12	4	3,2		
PM1515DX	15	17	15	4	4,0		
PM1525DX	15	17	25	4	6,8		
PM1615DX	16	18	15	4	4,3		
PM1620DX	16	18	20	4	5,8		
PM1625DX	16	18	25	4	7,1		
PM1815DX	18	20	15	4	4,7		+0,101 +0,051
PM1820DX	18	20	20	4	6,4		
PM1825DX	18	20	25	4	8,0		
PM2010DX	20	23	10	4	5,9		+0,121 +0,061
PM2015DX	20	23	15	4	8,4		
PM2020DX	20	23	20	4	11,3		
PM2025DX	20	23	25	4	14,0		
PM2030DX	20	23	30	4	17,5		
PM2215DX	22	25	15	6	9,5		
PM2220DX	22	25	20	6	12,5		
PM2225DX	22	25	25	6	15,6		
PM2230DX	22	25	30	6	18,5		
PM2425DX	24	27	25	6	17,0		
PM2430DX	24	27	30	6	20,0		
PM2515DX	25	28	15	6	10,0		
PM2520DX	25	28	20	6	14,0		
PM2525DX	25	28	25	6	17,5		
PM2530DX	25	28	30	6	21,0		
PM2825DX	28	32	25	6	28,5		+0,143 +0,073
PM2830DX	28	32	30	6	34,1		
PM283130DX	28	31	30	6	23,5		

Part No.	Technical Data						
GGB	Dimensions					Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	Lubrication hole Ø d_L	Weight g	Housing / Journal	$D_{i,a}$
PM3020DX	30	34	20	6	24,0	H7 / h8	+0,143 +0,073
PM3030DX	30	34	30	6	36,5		
PM3040DX	30	34	40	6	49,5		
PM3220DX	32	36	20	6	27,0		
PM3230DX	32	36	30	6	40,0		
PM3240DX	32	36	40	6	53,5		
PM3520DX	35	39	20	6	28,5		
PM3530DX	35	39	30	6	42,5		
PM3535DX	35	39	35	6	49,5		
PM3550DX	35	39	50	6	73,0		
PM4020DX	40	44	20	8	32,0		
PM4030DX	40	44	30	8	48,5		
PM4040DX	40	44	40	8	64,0		
PM4050DX	40	44	50	8	82,5		
PM4520DX	45	50	20	8	47,0		+0,183 +0,093
PM4530DX	45	50	30	8	72,0		
PM4540DX	45	50	40	8	96,0		
PM4545DX	45	50	45	8	108,0		
PM4550DX	45	50	50	8	120,5		
PM5040DX	50	55	40	8	105,0		+0,185 +0,095
PM5045DX	50	55	45	8	119,0		
PM5050DX	50	55	50	8	135,0		
PM5060DX	50	55	60	8	161,5		
PM5520DX	55	60	20	8	57,0		
PM5525DX	55	60	25	8	72,0		
PM5530DX	55	60	30	8	86,0		
PM5540DX	55	60	40	8	115,0		
PM5550DX	55	60	50	8	144,0		
PM5560DX	55	60	60	8	176,0		
PM6030DX	60	65	30	8	95,0		
PM6040DX	60	65	40	8	126,0		
PM6060DX	60	65	60	8	190,0		
PM6070DX	60	65	70	8	220,0		
PM6540DX	65	70	40	8	136,0		+0,247 +0,115
PM6560DX	65	70	60	8	203,0		
PM6570DX	65	70	70	8	237,3		
PM7040DX	70	75	40	8	144,5		
PM7050DX	70	75	50	8	181,0		
PM7060DX	70	75	60	8	220,5		
PM7065DX	70	75	65	8	234,0		
PM7070DX	70	75	70	8	255,0		
PM7080DX	70	75	80	8	292,0		

Other dimensions, including inch sizes and intermediate sizes over 300 mm available on request.
$D_{i,a}$ = Tolerances of internal bush diameter after installation in housing centre H7.
Remaining stock of PM DX bushes with Di ≤40 mm still tin-plated in some cases.
MB DX bushes (machinable) on request.

PM DX® Bushes, cylindrical (PM=prefinished)





Dimensions [mm], tests and material in accordance with ISO 3547 and GGB specification

Part No.	Technical Data						
GGB	Dimensions					Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	Lubrication hole Ø d_L	Weight g	Housing / Journal	$D_{i,a}$
PM7540DX	75	80	40	9,5	153,0	H7 / h8	+0,247 +0,115
PM7560DX	75	80	60	9,5	234,0		
PM7580DX	75	80	80	9,5	305,0		
PM8040DX	80	85	40	9,5	164,0		+0,250 +0,118
PM8050DX	80	85	50	9.5	206,5		
PM8060DX	80	85	60	9,5	249,0		
PM8080DX	80	85	80	9,5	320,0		
PM80100DX	80	85	100	9,5	415,0		
PM8540DX	85	90	40	9,5	175,0		
PM8560DX	85	90	60	9,5	260,0		
PM8580DX	85	90	80	9,5	435,0		
PM9040DX	90	95	40	9,5	190,0		
PM9060DX	90	95	60	9,5	280,0		
PM9080DX	90	95	80	9,5	370,0		
PM9090DX	90	95	90	9,5	415,0		
PM90100DX	90	95	100	9,5	467,0		
PM95100DX	95	100	100	9,5	480,0		
PM10050DX	100	105	50	9,5	255,0		
PM10060DX	100	105	60	9,5	305,0		
PM10080DX	100	105	80	9,5	415,0		
PM10095DX	100	105	95	9,5	485,0		
PM100115DX	100	105	115	9,5	585,0		
PM105110DX	105	110	110	9,5	595,0		
PM105115DX	105	110	115	9,5	623,0		
PM11060DX	110	115	60	9,5	340,0		
PM110110DX	110	115	110	9,5	620,0		
PM11550DX	115	120	50	9,5	290,0		

Part No.	Technical Data						
GGB	Dimensions					Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	Lubrication hole Ø d_L	Weight g	Housing / Journal	$D_{i,a}$
PM12060DX	120	125	60	9,5	365	H7 / h8	+0,260 +0,150
PM120100DX	120	125	100	9,5	615		
PM120110DX	120	125	110	9,5	675		
PM12560DX	125	130	60	9,5	385		
PM125100DX	125	130	100	9,5	645		
PM13060DX	130	135	60		395		
PM13080DX	130	135	80		530		
PM130100DX	130	135	100		660		
PM13560DX	135	140	60		490		
PM14050DX	140	145	50		360		
PM14060DX	140	145	60		430		
PM14080DX	140	145	80		575		
PM140100DX	140	145	100		717		
PM15050DX	150	155	50		385		
PM15080DX	150	155	80		610		
PM150100DX	150	155	100		765		
PM16050DX	160	165	50		413		
PM16060DX	160	165	60		488		
PM16080DX	160	165	80		648		
PM160100DX	160	165	100		815		
PM17060DX	170	175	60		520		
PM170100DX	170	175	100		865		
PM18050DX	180	185	50		465		+0,263 +0,153
PM18060DX	180	185	60		545		
PM180100DX	180	185	100		920		
PM19060DX	190	195	60		580		
PM190100DX	190	195	100		975		
PM20060DX	200	205	60		610		
PM20080DX	200	205	80		815		
PM200100DX	200	205	100		1.025		
PM22060DX	220	225	60		665		
PM220100DX	220	225	100		1.120		
PM24060DX	240	245	60		725		
PM240100DX	240	245	100		1.225		
PM25060DX	250	255	60		755		
PM250100DX	250	255	100		1.275		
PM28050DX	280	285	50		700		
PM28060DX	280	285	60		840		
PM28080DX	280	285	80		1.120		
PM280100DX	280	285	100		1.428		
PM280120DX	280	285	120		1.720		
PM30080DX	300	305	80		1.220		

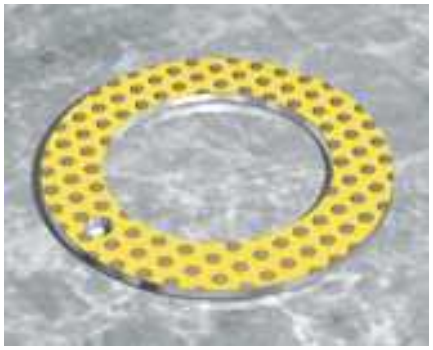
Inside and outside chamfers [in accordance with ISO 3547-1]

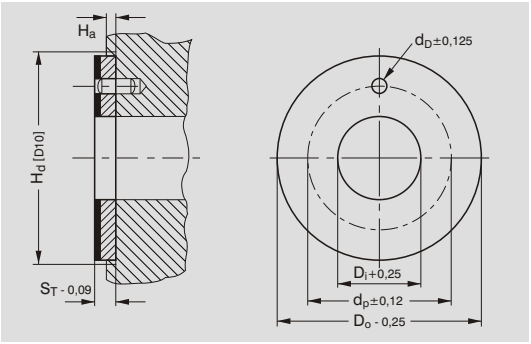
Inside Ø D_i [nominal dimension]	Wall thickness S_3 [nominal dimension]	Outside chamfer C_o	Inside chamfer C
8 - 18	1,0	0,6 ± 0,4	-0,1 to -0,5
20 - 25 (28)	1,5	0,6 ± 0,4	-0,1 to -0,7
28 - 40	2,0	1,1 ± 0,5	-0,1 to -0,7
45 - 300	2,5	1,6 ± 0,8	-0,2 to -1,0

Deformation of the chamfers by circular bending admissible.

Other dimensions, including inch sizes and intermediate sizes over 300 mm available on request.
$D_{i,a}$ = Tolerances of internal bush diameter after installation in housing centre H7.
MB DX bushes (machinable) on request.

PM DX® Thrust Washers (PM=prefinished)

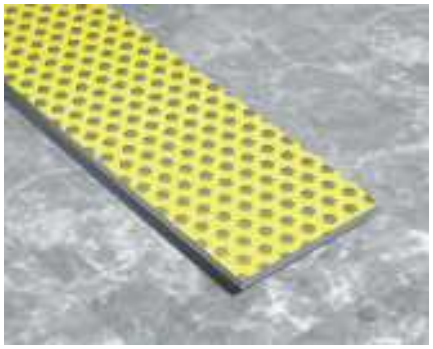




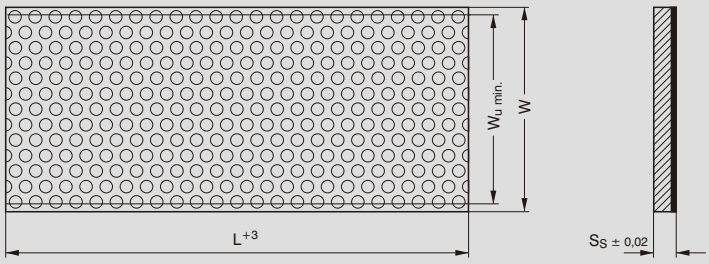
Part No.	Technical Data						
GGB	Dimensions						
	Inside Ø D_i	Outside Ø D_o	Thick-ness S_T	Dowel hole Ø d_D	Hole circle Ø d_p	Recess depth H_a	Weight g
WC08DX	10	20	1,58	-	-		2,2
WC10DX	12	24	1,58	1,75	18		3,0
WC12DX	14	26	1,58	2,25	20		3,3
WC14DX	16	30	1,58	2,25	22		4,4
WC16DX	18	32	1,58	2,25	25		4,9
WC18DX	20	36	1,58	3,25	28	0,95	6,2
WC20DX	22	38	1,58	3,25	30	to	6,7
WC22DX	24	42	1,58	3,25	33	1,20	8,3
WC24DX	26	44	1,58	3,25	35		8,5
WC25DX	28	48	1,58	4,25	38		10,5
WC30DX	32	54	1,58	4,25	43		13,5
WC35DX	38	62	1,58	4,25	50		16,9
WC40DX	42	66	1,58	4,25	54		18,7
WC45DX	48	74	2,60	4,25	61	1,45	41,3
WC50DX	52	78	2,60	4,25	65	to 1,70	44,2

2) Other dimensions (including those with dowel hole) available on request.

MB DX® Plates (MB=machinable)



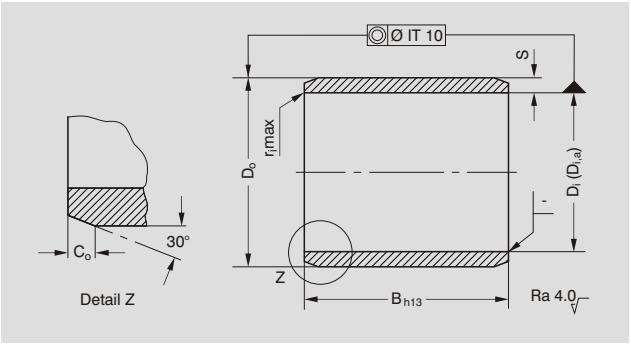
Note: Also available in lengths over 500 mm and machined on all sides.



Part No.	Technical Data				
GGB	Dimensions				
	Length L	Total width W	Useful width $W_{u\,min.}$	Thickness S_S	Weight g
S10150DX	500	160	150	1,05	450,0
S15190DX	500	200	190	1,54	900,0
S20190DX	500	200	190	2,03	1.300,0
S25190DX	500	200	190	2,55	1.700,0

Other dimensions available on request.
Maximum finishing depth 0,125 mm.
MB DX plates are delivered with electroplating (Cu) on the steel backing.

EP™ Bushes, cylindrical



Dimensions [mm], tests and material in accordance GGB specification.

Part No.	Technical Data					
GGB	Dimensions			Weight	Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	g	Housing H7	$D_{i,a}$
0505EP	5	7	5	0,1	+0,015 0	+0,105 +0,030
0508EP	5	7	8	0,2		
0510EP	5	7	10	0,3		
0606EP	6	8	6	0,2		
0608EP	6	8	8	0,3		
0610EP	6	8	10	0,3		
0806EP	8	10	6	0,2		+0,130 +0,040
0808EP	8	10	8	0,3		
0810EP	8	10	10	0,4		
0812EP	8	10	12	0,5		
0815EP	8	10	15	0,6		
1004EP	10	12	4	0,2	+0,018 0	
1006EP	10	12	6	0,3		
1008EP	10	12	8	0,4		
1010EP	10	12	10	0,5		
1015EP	10	12	15	0,7		
1020EP	10	12	20	1,0		
1210EP	12	14	10	0,6		+0,160 +0,050
1212EP	12	14	12	0,7		
1215EP	12	14	15	0,9		
1220EP	12	14	20	1,2		
1415EP	14	16	15	1,0		
1420EP	14	16	20	1,4		
1425EP	14	16	25	1,7		
1515EP	15	17	15	1,1		
1520EP	15	17	20	1,4		
1525EP	15	17	25	1,7		
2015EP	20	23	15	2,2	+0,021 0	+0,195 +0,065
2020EP	20	23	20	2,9		
2030EP	20	23	30	4,4		
2515EP	25	28	15	2,7		
2520EP	25	28	20	3,6		
2530EP	25	28	30	5,4		
3020EP	30	34	20	5,8	+0,025 0	+0,240 +0,080
3030EP	30	34	30	8,6		
3040EP	30	34	40	11,6		

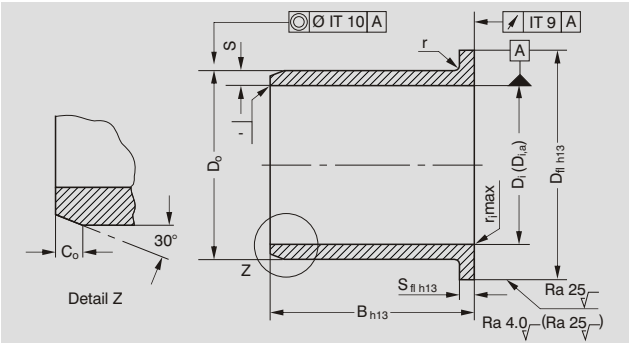
Other dimensions available on request.
$D_{i,a}$ = Tolerances of internal bush diameter after installation in housing centre H7.

Outside chamfers and inside radii

S	C_o	$r_i$max
1,0	0,5	0,1
1,5	0,8	0,2
2	0,8	0,2

Recommended tolerance class for shafts h7

EP™ Flanged Bushes



Dimensions [mm], tests and material in accordance GGB specification.

Part No.	Technical Data							
GGB	Dimensions						Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Flange Ø D_{fl}	Flange S_{fl}	Width B	Weight g	Housing / Journal	$D_{i,a}$
BB0505EP	5	7	11	1,0	5,0	0,2		
BB0604EP	6	8	12	1,0	4,0	0,2		+0,105
BB0606EP	6	8	12	1,0	6,0	0,3		+0,030
BB0608EP	6	8	12	1,0	8,0	0,4	+0,015	
BB0610EP	6	8	12	1,0	10,0	0,4	0	
BB0806EP	8	10	15	1,0	5,5	0,4		
BB0808EP	8	10	15	1,0	7,5	0,5		
BB0810EP	8	10	15	1,0	10,0	0,5		
BB1007EP	10	12	18	1,0	7,0	0,6		+0,130
BB1009EP	10	12	18	1,0	9,0	0,7		+0,040
BB1012EP	10	12	18	1,0	12,0	0,8		
BB1015EP	10	12	18	1,0	15,0	1,0		
BB1017EP	10	12	18	1,0	17,0	1,1		
BB1207EP	12	14	20	1,0	7,0	0,6		
BB1209EP	12	14	20	1,0	9,0	0,8		
BB1212EP	12	14	20	1,0	12,0	1,1		
BB1215EP	12	14	20	1,0	15,0	1,7	+0,018	
BB1217EP	12	14	20	1,0	17,0	1,3	0	
BB1220EP	12	14	20	1,0	20,0	1,5		
BB1412EP	14	16	22	1,0	12,0	1,1		+0,160
BB1417EP	14	16	22	1,0	17,0	1,5		+0,050
BB1509EP	15	17	23	1,0	9,0	1,0		
BB1512EP	15	17	23	1,0	12,0	1,2		
BB1517EP	15	17	23	1,0	17,0	1,5		
BB1520EP	15	17	23	1,0	20,0	1,8		
BB1617EP	16	18	24	1,0	17,0	1,7		
BB2012EP	20	23	30	1,5	11,5	2,4		
BB2017EP	20	23	30	1,5	16,5	3,2		
BB2022EP	20	23	30	1,5	21,5	3,9	+0,021	+0,195
BB2512EP	25	28	35	1,5	11,5	2,9	0	+0,065
BB2517EP	25	28	35	1,5	16,5	3,9		
BB2522EP	25	28	35	1,5	21,5	4,9		

Other dimensions available on request.
$D_{i,a}$ = Tolerances of internal bush diameter after installation in housing centre H7.

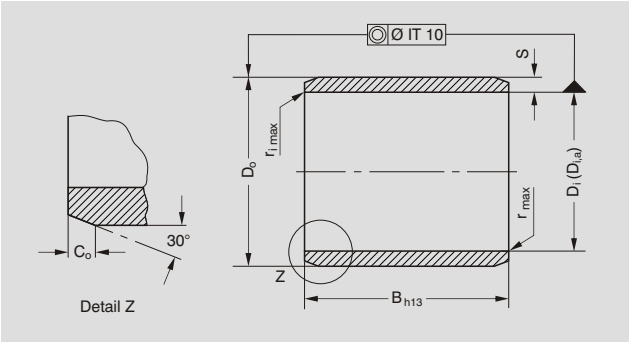
Outside chamfers and inside radii

S	C_o	$r_{i\,max}$
1,0	0,5	0,1
1,5	0,8	0,2

S	r (mm)
≤ 1	0,3
>1	0,5

Recommended tolerance class for shafts h7

EP22™ Bushes, cylindrical



Outside chamfers and inside radii

S	C_o	$r_{i\,max}$
1,0	0,5	0,2
1,5	0,8	0,3
2	0,8	0,3

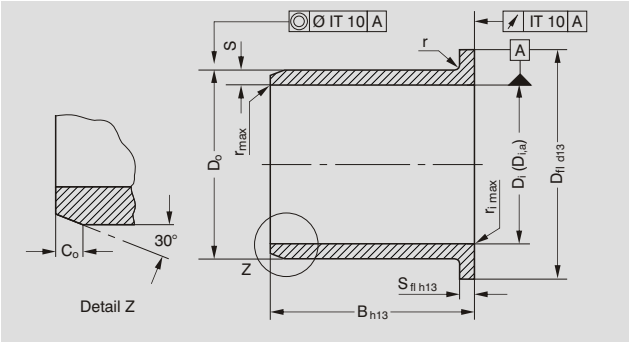
Recommended tolerance class for shafts h9

Dimensions [mm], tests and material in accordance GGB specification.

Part No.	Technical Data					
GGB	Dimensions			Weight	Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	g	Housing H7	$D_{i,a}$
0806EP22	8	10	6	0,2	+0,015 0	+0,083 +0,025
0808EP22	8	10	8	0,3		
0810EP22	8	10	10	0,4		
0812EP22	8	10	12	0,5		
0815EP22	8	10	15	0,6		
1004EP22	10	12	4	0,2	+0,018 0	
1006EP22	10	12	6	0,3		
1008EP22	10	12	8	0,4		
1010EP22	10	12	10	0,5		
1015EP22	10	12	15	0,7		
1020EP22	10	12	20	1,0		
1210EP22	12	14	10	0,6		+0,102 +0,032
1212EP22	12	14	12	0,7		
1215EP22	12	14	15	0,9		
1220EP22	12	14	20	1,2		
1415EP22	14	16	15	1,0		
1420EP22	14	16	20	1,4		
1425EP22	14	16	25	1,7		
1515EP22	15	17	15	1,1		
1520EP22	15	17	20	1,4		
1525EP22	15	17	25	1,7		
2015EP22	20	23	15	2,2	+0,021 0	+0,124 +0,040
2020EP22	20	23	20	2,9		
2030EP22	20	23	30	4,4		
2515EP22	25	28	15	2,7		
2520EP22	25	28	20	3,6		

Other dimensions available on request.
$D_{i,a}$ = Tolerances of internal bush diameter after installation in housing centre H7.

EP22™ Flanged Bushes



Dimensions [mm], tests and material in accordance GGB specification.

Outside chamfers and inside radii

S	C_o	$r_{i\,max}$
1,0	0,5	0,2
1,5	0,8	0,3

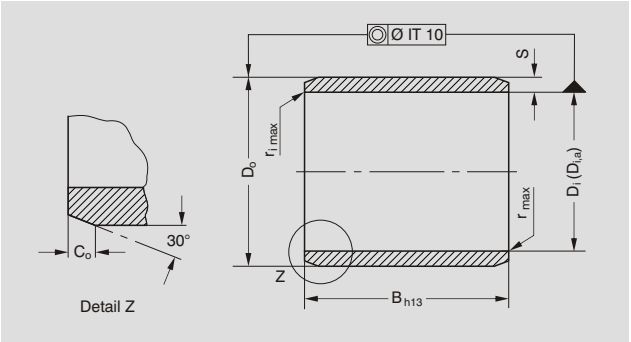
S	r (mm)
≤ 1	0,3
>1	0,5

Recommended tolerance class for shafts h9

Part No.	Technical Data							
GGB	Dimensions						Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Flange Ø D_{fl}	Flange S_{fl}	Width B	Weight g	Housing / Journal	$D_{i,a}$
BB0806EP22	8	10	15	1,0	5,5	0,4	+0,015	
BB0808EP22	8	10	15	1,0	7,5	0,5	0	
BB0810EP22	8	10	15	1,0	10	0,5		
BB1007EP22	10	12	18	1,0	7	0,6		+0,083
BB1009EP22	10	12	18	1,0	9	0,7		+0,025
BB1012EP22	10	12	18	1,0	12	0,8		
BB1015EP22	10	12	18	1,0	15	1,0		
BB1017EP22	10	12	18	1,0	17	1,1		
BB1207EP22	12	14	20	1,0	7	0,6		
BB1209EP22	12	14	20	1,0	9	0,8		
BB1212EP22	12	14	20	1,0	12	1,2		
BB1215EP22	12	14	20	1,0	15	1,3	+0,018	
BB1217EP22	12	14	20	1,0	17	1,4	0	
BB1220EP22	12	14	20	1,0	20	1,5		
BB1412EP22	14	16	22	1,0	12	0,9		+0,102
BB1417EP22	14	16	22	1,0	17	1,5		+0,032
BB1509EP22	15	17	23	1,0	9	1,0		
BB1512EP22	15	17	23	1,0	12	1,2		
BB1517EP22	15	17	23	1,0	17	1,5		
BB1520EP22	15	17	23	1,0	20	1,8		
BB1617EP22	16	18	24	1,0	17	1,7		
BB2012EP22	20	23	30	1,5	11,5	2,4		
BB2017EP22	20	23	30	1,5	16,5	3,2		
BB2022EP22	20	23	30	1,5	21,5	3,9	+0,021	+0,124
BB2512EP22	25	28	35	1,5	11,5	2,9	0	+0,040
BB2517EP22	25	28	35	1,5	16,5	3,9		
BB2522EP22	25	28	35	1,5	21,5	4,9		

Other dimensions available on request.
$D_{i,a}$ = Tolerances of internal bush diameter after installation in housing centre H7.

EP43™ Bushes, cylindrical



Outside chamfers and inside radii

S	C_o	$r_{i\,max}$
1,0	0,5	0,2
1,5	0,8	0,3
2	0,8	0,3

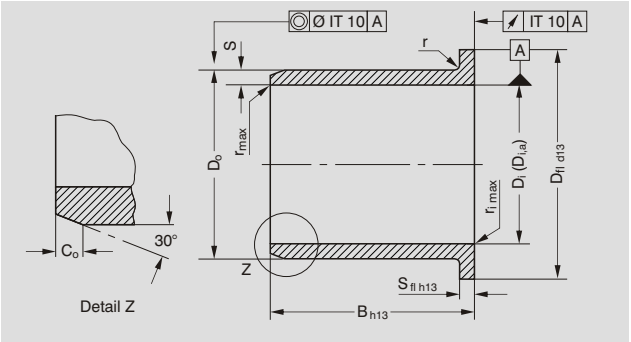
Recommended tolerance class for shafts h9

Dimensions [mm], tests and material in accordance GGB specification.

Part No.	Technical Data					
GGB	Dimensions			Weight	Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	g	Housing H7	$D_{i,a}$
0806EP43	8	10	6	0,2	+0,015 0	+0,071 +0,013
0808EP43	8	10	8	0,3		
0810EP43	8	10	10	0,4		
0812EP43	8	10	12	0,5		
0815EP43	8	10	15	0,6		
1004EP43	10	12	4	0,2	+0,018 0	
1006EP43	10	12	6	0,3		
1008EP43	10	12	8	0,4		
1010EP43	10	12	10	0,5		
1015EP43	10	12	15	0,7		
1020EP43	10	12	20	1,0		
1210EP43	12	14	10	0,6		+0,086 +0,016
1212EP43	12	14	12	0,7		
1215EP43	12	14	15	0,9		
1220EP43	12	14	20	1,2		
1415EP43	14	16	15	1,0		
1420EP43	14	16	20	1,4		
1425EP43	14	16	25	1,7		
1515EP43	15	17	15	1,1		
1520EP43	15	17	20	1,4		
1525EP43	15	17	25	1,7		
2015EP43	20	23	15	2,2	+0,021 0	+0,104 +0,020
2020EP43	20	23	20	2,9		
2030EP43	20	23	30	4,4		
2515EP43	25	28	15	2,7		
2520EP43	25	28	20	3,6		

Other dimensions available on request.
$D_{i,a}$ = Tolerances of internal bush diameter after installation in housing centre H7.

EP43™ Flanged Bushes



Dimensions [mm], tests and material in accordance GGB specification.

Outside chamfers and inside radii

S	C_o	$r_{i\,max}$
1,0	0,5	0,2
1,5	0,8	0,3

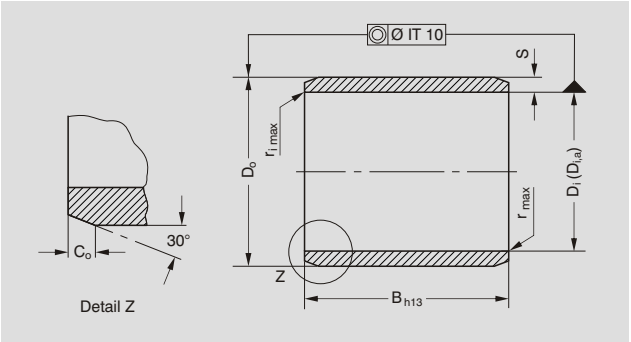
S	r (mm)
≤ 1	0,3
>1	0,5

Recommended tolerance class for shafts h9

Part No.	Technical Data							
GGB	Dimensions						Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Flange Ø D_{fl}	Flange S_{fl}	Width B	Weight g	Housing / Journal	$D_{i,a}$
BB0806EP43	8	10	15	1,0	5,5	0,4	+0,015	
BB0808EP43	8	10	15	1,0	7,5	0,5	0	
BB0810EP43	8	10	15	1,0	10	0,5		
BB1007EP43	10	12	18	1,0	7	0,6		+0,071
BB1009EP43	10	12	18	1,0	9	0,7		+0,013
BB1012EP43	10	12	18	1,0	12	0,8		
BB1015EP43	10	12	18	1,0	15	1,0		
BB1017EP43	10	12	18	1,0	17	1,1		
BB1207EP43	12	14	20	1,0	7	0,6		
BB1209EP43	12	14	20	1,0	9	0,8		
BB1212EP43	12	14	20	1,0	12	1,2		
BB1215EP43	12	14	20	1,0	15	1,3	+0,018	
BB1217EP43	12	14	20	1,0	17	1,4	0	
BB1220EP43	12	14	20	1,0	20	1,5		
BB1412EP43	14	16	22	1,0	12	0,9		+0,086
BB1417EP43	14	16	22	1,0	17	1,5		+0,016
BB1509EP43	15	17	23	1,0	9	1,0		
BB1512EP43	15	17	23	1,0	12	1,2		
BB1517EP43	15	17	23	1,0	17	1,5		
BB1520EP43	15	17	23	1,0	20	1,8		
BB1617EP43	16	18	24	1,0	17	1,7		
BB2012EP43	20	23	30	1,5	11,5	2,4		
BB2017EP43	20	23	30	1,5	16,5	3,2		
BB2022EP43	20	23	30	1,5	21,5	3,9	+0,021	+0,104
BB2512EP43	25	28	35	1,5	11,5	2,9	0	+0,020
BB2517EP43	25	28	35	1,5	16,5	3,9		
BB2522EP43	25	28	35	1,5	21,5	4,9		

Other dimensions available on request.
$D_{i,a}$ = Tolerances of internal bush diameter after installation in housing centre H7.

EP63™ Bushes, cylindrical



Outside chamfers and inside radii

S	C_o	$r_{i\,max}$
1,0	0,5	0,2
1,5	0,8	0,3
2	0,8	0,3

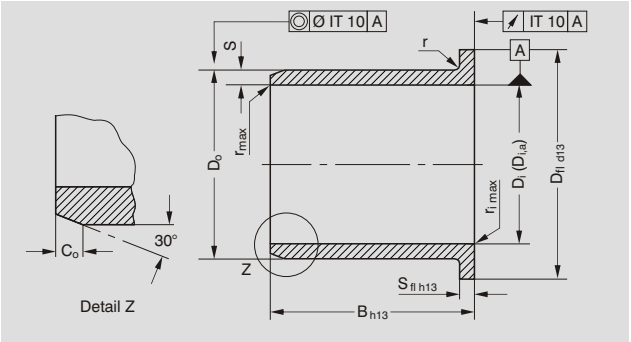
Recommended tolerance class for shafts h9

Dimensions [mm], tests and material in accordance GGB specification.

Part No.	Technical Data					
GGB	Dimensions			Weight	Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	g	Housing H7	$D_{i,a}$
0806EP63	8	10	6	0,2	+0,015 0	+0,071 +0,013
0808EP63	8	10	8	0,3		
0810EP63	8	10	10	0,4		
0812EP63	8	10	12	0,5		
0815EP63	8	10	15	0,6		
1004EP63	10	12	4	0,2	+0,018 0	
1006EP63	10	12	6	0,3		
1008EP63	10	12	8	0,4		
1010EP63	10	12	10	0,5		
1015EP63	10	12	15	0,7		
1020EP63	10	12	20	1,0		
1210EP63	12	14	10	0,6		+0,086 +0,016
1212EP63	12	14	12	0,7		
1215EP63	12	14	15	0,9		
1220EP63	12	14	20	1,2		
1415EP63	14	16	15	1,0		
1420EP63	14	16	20	1,4		
1425EP63	14	16	25	1,7		
1515EP63	15	17	15	1,1		
1520EP63	15	17	20	1,4		
1525EP63	15	17	25	1,7		
2015EP63	20	23	15	2,2	+0,021 0	+0,104 +0,020
2020EP63	20	23	20	2,9		
2030EP63	20	23	30	4,4		
2515EP63	25	28	15	2,7		
2520EP63	25	28	20	3,6		

Other dimensions available on request.
$D_{i,a}$ = Tolerances of internal bush diameter after installation in housing centre H7.

EP63™ Flanged Bushes



Dimensions [mm], tests and material in accordance GGB specification.

Outside chamfers and inside radii

S	C_o	$r_{i\,max}$
1,0	0,5	0,2
1,5	0,8	0,3

S	r (mm)
≤ 1	0,3
>1	0,5

Recommended tolerance class for shafts h9

Part No.	Technical Data							
GGB	Dimensions						Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Flange Ø D_{fl}	Flange S_{fl}	Width B	Weight g	Housing / Journal	$D_{i,a}$
BB0806EP63	8	10	15	1,0	5,5	0,4	+0,015	
BB0808EP63	8	10	15	1,0	7,5	0,5	0	
BB0810EP63	8	10	15	1,0	10	0,5		
BB1007EP63	10	12	18	1,0	7	0,6		+0,071
BB1009EP63	10	12	18	1,0	9	0,7		+0,013
BB1012EP63	10	12	18	1,0	12	0,8		
BB1015EP63	10	12	18	1,0	15	1,0		
BB1017EP63	10	12	18	1,0	17	1,1		
BB1207EP63	12	14	20	1,0	7	0,6		
BB1209EP63	12	14	20	1,0	9	0,8		
BB1212EP63	12	14	20	1,0	12	1,2		
BB1215EP63	12	14	20	1,0	15	1,3	+0,018	
BB1217EP63	12	14	20	1,0	17	1,4	0	
BB1220EP63	12	14	20	1,0	20	1,5		
BB1412EP63	14	16	22	1,0	12	0,9		+0,086
BB1417EP63	14	16	22	1,0	17	1,5		+0,016
BB1509EP63	15	17	23	1,0	9	1,0		
BB1512EP63	15	17	23	1,0	12	1,2		
BB1517EP63	15	17	23	1,0	17	1,5		
BB1520EP63	15	17	23	1,0	20	1,8		
BB1617EP63	16	18	24	1,0	17	1,7		
BB2012EP63	20	23	30	1,5	11,5	2,4		
BB2017EP63	20	23	30	1,5	16,5	3,2		
BB2022EP63	20	23	30	1,5	21,5	3,9	+0,021	+0,104
BB2512EP63	25	28	35	1,5	11,5	2,9	0	+0,020
BB2517EP63	25	28	35	1,5	16,5	3,9		
BB2522EP63	25	28	35	1,5	21,5	4,9		

Other dimensions available on request.
$D_{i,a}$ = Tolerances of internal bush diameter after installation in housing centre H7.

EP™ Rod Stock

Maintenance-free thermoplastic bearing material

EP™ Rod Stock

EP22

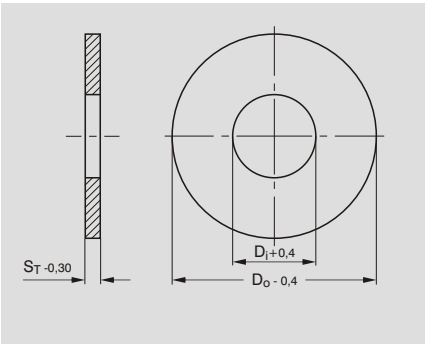
EP43

Part No.	Composition	Form	Ø [mm] +0,1/+0,9	Length [mm] 0/+30	Weight appr. [g]
RD101000EP22	**EP22** PBT+PTFE	Rod stock	10	1000	120
RD201000EP22			20	1000	490
RD301000EP22			30	1000	1090
RD201000EP43	**EP43** PPS+PTFE+Aramid	Rod stock	20	1000	450
RD301000EP43			30	1000	1000

Glacetal KA™ Thrust Washers

Low-maintenance, made of polyacetal copolymer (POM)

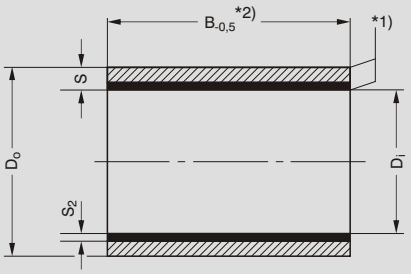
Glacetal KA™ Thrust Washers



Part No.	Technical Data			
GGB	Dimensions			
	Inside Ø D_i	Outside Ø D_o	Thickness S_T	Weight g
WC10KA	10,5	24,20	1,65	0,8
WC12KA	12,5	26,20	1,65	0,9
WC14KA	14,5	30,20	1,65	1,1
WC16KA	16,5	32,20	1,65	1,3
WC18KA	18,5	36,20	1,65	1,6
WC20KA	20,5	38,20	1,65	1,7
WC22KA	22,5	42,20	1,65	2,0
WC24KA	24,5	44,20	1,65	2,2
WC25KA	25,5	48,20	1,65	2,8
WC28KA	28,5	48,20	1,65	2,5
WC30KA	30,5	54,20	1,65	3,3
WC35KA	36,0	62,20	1,65	4,3
WC40KA	41,0	66,20	1,65	4,7
WC45KA	46,0	74,20	2,15	5,6
WC50KA	51,0	78,20	2,15	5,8

Other dimensions available on request.

GAR-MAX® Bushes, cylindrical



Sliding layer thickness $S_2 = 0,63$

The elasticity removes the tension from the self-aligning bearings. For this reason, the dimensional accuracy and fit can only be measured in a ring gauge and when the bushes are installed.

*1) Deburring by "drumming". Installation chamfers are possible by means of additional mechanical processing.

*2) for $D_i > 75 = B_{-1}$

Dimensions [mm]

Part No.	Technical Data						
GGB	Dimensions					Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	Thick-ness S	Weight g	Housing / Journal	Clearance min./max.
162015GM	16	20	15	2,0	3,8	H7 / h8	0,020 / 0,198
162020GM	16	20	20	2,0	4,8		
202415GM	20	24	15	2,0	4,1		0,020 / 0,204
202420GM	20	24	20	2,0	5,4		
202425GM	20	24	25	2,0	6,8		
222620GM	22	26	20	2,0	6,5		0,020 / 0,208
222625GM	22	26	25	2,0	8,0		
253020GM	25	30	20	2,5	8,1		
253025GM	25	30	25	2,5	10,6		
253030GM	25	30	30	2,5	12,1		
283422GM	28	34	22	3,0	12,0		
303620GM	30	36	20	3,0	11,7		
303630GM	30	36	30	3,0	17,4		
303636GM	30	36	36	3,0	21,0		
303640GM	30	36	40	3,0	23,3		
303650GM	30	36	50	3,0	29,1		
354130GM	35	41	30	3,0	20,1		0,020 / 0,214
354135GM	35	41	35	3,0	23,5		
354140GM	35	41	40	3,0	26,8		
354150GM	35	41	50	3,0	33,5		
404820GM	40	48	20	4,0	20,7		
404830GM	40	48	30	4,0	31,0		
404840GM	40	48	40	4,0	41,4		
404850GM	40	48	50	4,0	51,7		
455330GM	45	53	30	4,0	34,5		0,025 / 0,244
455340GM	45	53	40	4,0	46,1		
455345GM	45	53	45	4,0	51,8		
455350GM	45	53	50	4,0	57,5		
455360GM	45	53	60	4,0	69,1		
505830GM	50	58	30	4,0	38,1		
505840GM	50	58	40	4,0	50,8		
505850GM	50	58	50	4,0	63,4		
505860GM	50	58	60	4,0	76,1		
556330GM	55	63	30	4,0	41,6		0,025 / 0,251
556340GM	55	63	40	4,0	55,5		
556360GM	55	63	60	4,0	83,2		
607030GM	60	70	30	5,0	57,3		
607040GM	60	70	40	5,0	76,4		
607045GM	60	70	45	5,0	85,9		
607050GM	60	70	50	5,0	95,4		
607060GM	60	70	60	5,0	114,6		
657550GM	65	75	50	5,0	102,8		

Production of special dimensions (e.g. other wall thicknesses, running layer thicknesses) is possible.

Part No.	Technical Data						
GGB	Dimensions					Installation tolerance	
	Inside Ø D_i	Outside Ø D_o	Width B	Thick-ness S	Weight g	Housing / Journal	Clearance min./max.
708040GM	70	80	40	5,0	86,7	H7 / h8	0,030 / 0,236
708050GM	70	80	50	5,0	110,2		
708055GM	70	80	55	5,0	121,3		
708060GM	70	80	60	5,0	130,0		
708070GM	70	80	70	5,0	154,2		
708080GM	70	80	80	5,0	173,4		
758550GM	75	85	50	5,0	117,5		0,040 / 0,271
758560GM	75	85	60	5,0	140,9		
758570GM	75	85	70	5,0	164,5		
758580GM	75	85	80	5,0	187,9		
809050GM	80	90	50	5,0	124,8		
809060GM	80	90	60	5,0	149,8		
809070GM	80	90	70	5,0	174,7		
809080GM	80	90	80	5,0	199,7		
859560GM	85	95	60	5,0	158,6		0,040 / 0,279
859580GM	85	95	80	5,0	211,5		
9010570GM	90	105	70	7,5	300,6		
10011580GM	100	115	80	7,5	378,8		0,040 / 0,304
100115100GM	100	115	100	7,5	473,5		
100115120GM	100	115	120	7,5	568,2		
110125100GM	110	125	100	7,5	517,5		0,040 / 0,309
110125120GM	110	125	120	7,5	620,9		
120135100GM	120	135	100	7,5	561,6		0,040 / 0,329
120135120GM	120	135	120	7,5	673,9		

Dimensions in assembled state

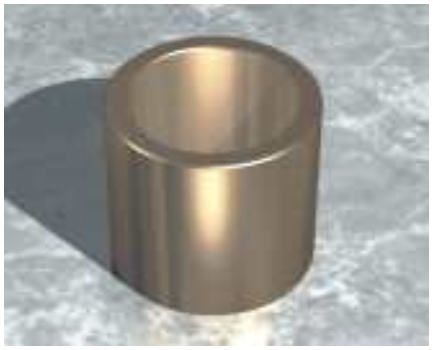
Inside Ø D_i		Inside Ø D_i	
16 - 25	+0,190 / +0,110	>70 - 85	+0,265 / +0,165
>25 - 40	+0,195 / +0,115	>85 - 100	+0,275 / +0,175
>40 - 50	+0,230 / +0,130	>100 - 110	+0,300 / +0,175
>50 - 65	+0,240 / +0,140	>110 - 120	+0,305 / +0,180
>65 - 70	+0,245 / +0,145		

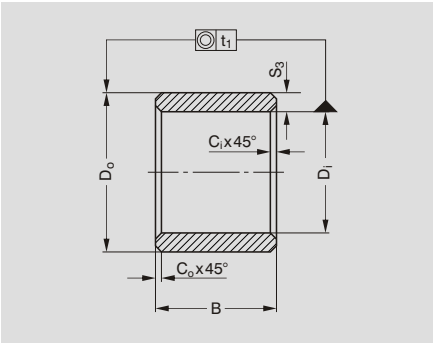
Outside Ø D_o		Outside Ø D_o	
>16 - 25	+0,090 / +0,040	>70 - 85	+0,125 / +0,075
>25 - 40	+0,095 / +0,045	>85 - 100	+0,135 / +0,085
>40 - 50	+0,105 / +0,055	>100 - 110	+0,140 / +0,090
>50 - 70	+0,115 / +0,065	>110 - 120	+0,170 / +0,100

Sinterbronze Bearing Material

Self-lubricating (oil-impregnated)

Sinterbronze bushes, cylindrical (similar to Sint A 50)





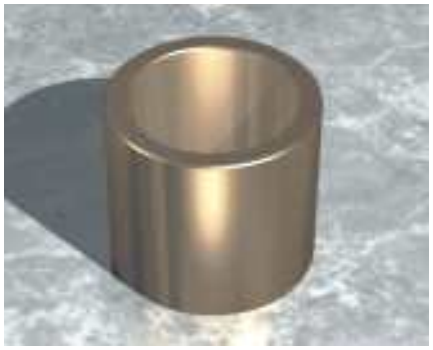
t_1 for $D_i \leq 20$ mm = 50 µm
t_1 for 20 mm < $D_i \leq 35$ mm = 70 µm
t_1 for $D_i > 35$ = 100 µm
chamfers C = (0,1 bis 0,2) S_3
minimum 0,2 mm
$B > 10 \pm 1\%$
$B \leq 10 \pm 0{,}1$ mm

Part No.	Technical Data				
GGB	Dimensions			Weight	Installation tolerance Housing / Journal
	Inside Ø D_i	Outside Ø D_o	Width B	g	
020502BP25	2	5	2	0,2	H7 / f7
020503BP25	2	5	3	0,3	
030604BP25	3	6	4	0,6	
030606BP25	3	6	6	0,9	
030610BP25	3	6	10	1,4	
040704BP25	4	7	4	0,7	
040708BP25	4	7	8	1,4	
040712BP25	4	7	12	2,1	
040804BP25	4	8	4	1,0	
040808BP25	4	8	8	2,0	
040812BP25	4	8	12	3,0	
050805BP25	5	8	5	1,0	
050808BP25	5	8	8	1,7	
050810BP25	5	8	10	2,1	
050812BP25	5	8	12	2,5	
050816BP25	5	8	16	3,3	
050904BP25	5	9	4	1,3	
050905BP25	5	9	5	1,5	
050908BP25	5	9	8	2,4	
060906BP25	6	9	6	1,4	
060910BP25	6	9	10	2,4	
060912BP25	6	9	12	3,8	
060916BP25	6	9	16	3,5	
061006BP25	6	10	6	2,0	
061010BP25	6	10	10	3,3	
061012BP25	6	10	12	3,9	
061016BP25	6	10	16	5,4	
061206BP25	6	12	6	3,4	
061210BP25	6	12	10	5,7	
061212BP25	6	12	12	6,8	
061216BP25	6	12	16	9,1	
071005BP25	7	10	5	1,4	
071008BP25	7	10	8	2,2	
071010BP25	7	10	10	2,7	
081108BP25	8	11	8	2,4	
081112BP25	8	11	12	3,6	
081116BP25	8	11	16	4,8	
081120BP25	8	11	20	6,0	
081208BP25	8	12	8	3,4	
081212BP25	8	12	12	5,1	
081216BP25	8	12	16	6,7	
081220BP25	8	12	20	8,4	
081408BP25	8	14	8	5,6	
081412BP25	8	14	12	8,3	
081416BP25	8	14	16	11,0	
081420BP25	8	14	20	13,9	

Part No.	Technical Data				
GGB	Dimensions			Weight	Installation tolerance Housing / Journal
	Inside Ø D_i	Outside Ø D_o	Width B	g	
091206BP25	9	12	6	2,0	H7 / f7
091210BP25	9	12	10	3,3	
091214BP25	9	12	14	4,6	
101310BP25	10	13	10	3,6	
101316BP25	10	13	16	5,3	
101320BP25	10	13	20	7,3	
101325BP25	10	13	25	9,1	
101410BP25	10	14	10	5,1	
101416BP25	10	14	16	8,1	
101420BP25	10	14	20	10,1	
101425BP25	10	14	25	12,6	
101510BP25	10	15	10	6,6	
101516BP25	10	15	16	10,2	
101520BP25	10	15	20	13,2	
101525BP25	10	15	25	16,4	
101610BP25	10	16	10	8,2	
101616BP25	10	16	16	13,1	
101620BP25	10	16	20	16,4	
101625BP25	10	16	25	20,5	
121512BP25	12	15	12	5,1	
121516BP25	12	15	16	6,8	
121520BP25	12	15	20	8,5	
121525BP25	12	15	25	10,6	
121612BP25	12	16	12	7,1	
121616BP25	12	16	16	9,4	
121620BP25	12	16	20	11,8	
121625BP25	12	16	25	14,7	
121712BP25	12	17	12	9,2	
121716BP25	12	17	16	12,2	
121720BP25	12	17	20	15,3	
121725BP25	12	17	25	19,1	
121812BP25	12	18	12	10,7	
121816BP25	12	18	16	14,6	
121820BP25	12	18	20	17,6	
121825BP25	12	18	25	22,3	
141814BP25	14	18	14	9,4	
141818BP25	14	18	18	11,7	
141822BP25	14	18	22	14,8	
141828BP25	14	18	28	18,9	
142014BP25	14	20	14	15,0	
142018BP25	14	20	18	19,4	
142022BP25	14	20	22	23,6	
142028BP25	14	20	28	30,0	
151916BP25	15	19	16	11,4	
151920BP25	15	19	20	14,3	
151925BP25	15	19	25	18,0	
151932BP25	15	19	32	22,9	
152116BP25	15	21	16	18,2	
152120BP25	15	21	20	22,0	
152125BP25	15	21	25	27,5	
152132BP25	15	21	32	36,2	

Other dimensions/materials as well as special parts on request.
Note: dividing and shortening is not carried out by GGB.
Tolerances applicable for wall thicknesses <4 mm. For wall thicknesses of 4 mm and more please consult GGB.

Sinterbronze bushes, cylindrical (similar to Sint A 50)



After the bushes have been pressed into a H7 housing hole using an m6 mandrel, cylindrical bushes have an H7 inside diameter (H8 for Ø ≥ 50 mm) and flanged bushes have an H8 inside bush diameter .

Delivery tolerance in accordance with ISO standard F7/s7 for cylindrical bushes (for D_i > 50 mm and D_o > 50 mm F8/s8) and F8/s8 for flanged bushes.

Part No.	Technical Data				
GGB	Dimensions			Weight g	Installation tolerance Housing / Journal
	Inside Ø D_i	Outside Ø D_o	Width B		
162016BP25	16	20	16	12,2	
162020BP25	16	20	20	15,3	
162025BP25	16	20	25	19,0	
162032BP25	16	20	32	24,2	
162216BP25	16	22	16	19,2	
162220BP25	16	22	20	24,0	
162225BP25	16	22	25	30,0	
162232BP25	16	22	32	38,3	
182218BP25	18	22	18	15,1	
182222BP25	18	22	22	18,5	
182228BP25	18	22	28	23,6	
182236BP25	18	22	36	30,3	
182418BP25	18	24	18	23,8	
182422BP25	18	24	22	29,2	
182428BP25	18	24	28	37,1	
182436BP25	18	24	36	47,7	
182518BP25	18	25	18	28,6	
182522BP25	18	25	22	35,0	
182528BP25	18	25	28	44,5	
182536BP25	18	25	36	57,2	
202416BP25	20	24	16	14,8	
202420BP25	20	24	20	18,6	
202425BP25	20	24	25	23,1	H7 / f7
202432BP25	20	24	32	29,8	
202516BP25	20	25	16	18,9	
202520BP25	20	25	20	23,7	
202525BP25	20	25	25	29,6	
202532BP25	20	25	32	37,8	
202616BP25	20	26	16	23,2	
202620BP25	20	26	20	29,2	
202625BP25	20	26	25	36,2	
202632BP25	20	26	32	46,3	
202816BP25	20	28	16	32,3	
202820BP25	20	28	20	40,4	
202832BP25	20	28	32	64,6	
222718BP25	22	27	18	23,2	
222728BP25	22	27	28	36,1	
222736BP25	22	27	36	46,4	
222818BP25	22	28	18	28,5	
222822BP25	22	28	22	34,9	
222828BP25	22	28	28	44,4	
222836BP25	22	28	36	57,0	
222918BP25	22	29	18	33,8	
222936BP25	22	29	36	67,6	

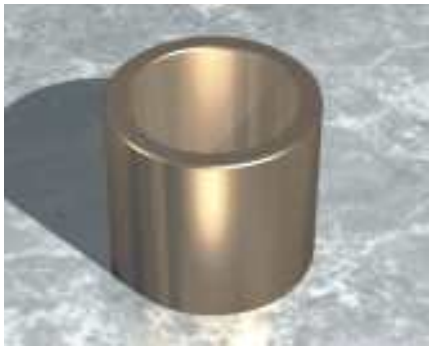
Part No.	Technical Data				
GGB	Dimensions			Weight g	Installation tolerance Housing / Journal
	Inside Ø D_i	Outside Ø D_o	Width B		
253020BP25	25	30	20	28,9	
253025BP25	25	30	25	36,2	
253032BP25	25	30	32	43,6	
253040BP25	25	30	40	57,9	
253220BP25	25	32	20	42,0	
253225BP25	25	32	25	52,4	
253232BP25	25	32	32	67,1	
253240BP25	25	32	40	83,9	
283222BP25	28	32	22	27,8	
283236BP25	28	32	36	45,4	
283245BP25	28	32	45	56,8	
283322BP25	28	33	22	34,2	
283345BP25	28	33	45	73,1	
283622BP25	28	36	22	57,4	
283628BP25	28	36	28	73,1	
283636BP25	28	36	36	93,9	
283645BP25	28	36	45	117,4	
303824BP25	30	38	24	68,7	
303830BP25	30	38	30	85,8	H7 / f7
303838BP25	30	38	38	108,7	
323820BP25	32	38	20	44,2	
323825BP25	32	38	25	55,2	
323832BP25	32	38	32	70,7	
323840BP25	32	38	40	88,4	
323850BP25	32	38	50	110,5	
324025BP25	32	40	25	75,7	
324032BP25	32	40	32	96,9	
324040BP25	32	40	40	121,2	
324050BP25	32	40	50	151,4	
354422BP25	35	44	22	82,1	
354428BP25	35	44	28	130,6	
354435BP25	35	44	35	130,7	
354525BP25	35	45	25	105,6	
354535BP25	35	45	35	147,2	
354540BP25	35	45	40	168,3	
354550BP25	35	45	50	211,2	
364245BP25	36	42	45	110,8	
364545BP25	36	45	45	171,6	

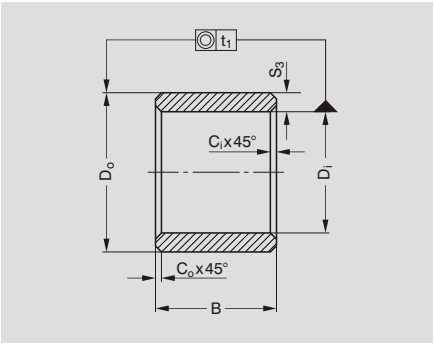
Other dimensions/materials as well as special parts on request.
Note: dividing and shortening is not carried out by GGB.
Tolerances applicable for wall thicknesses <4 mm. For wall thicknesses of 4 mm and more please consult GGB.

Sinterbronze Bearing Material

Self-lubricating (oil-impregnated)

Sinterbronze bushes, cylindrical (similar to Sint A 50)





t_1 for $D_i \leq 20$ mm = 50 µm
t_1 for 20 mm < $D_i \leq 35$ mm = 70 µm
t_1 for $D_i > 35$ = 100 µm
chamfers C = (0,1 to 0,2) S_3
minimum 0,2 mm
$B > 10 \pm 1\%$
$B \leq 10 \pm 0{,}1$ mm

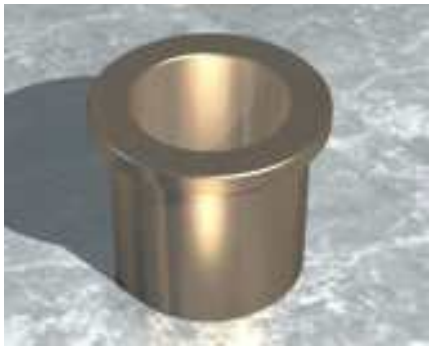
Part No.	Technical Data				
GGB	Dimensions			Weight	Installation tolerance Housing / Journal
	Inside Ø D_i	Outside Ø D_o	Width B	g	
384425BP25	38	44	25	64,4	
384445BP25	38	44	45	116,9	
404625BP25	40	46	25	67,8	
404632BP25	40	46	32	86,8	
404640BP25	40	46	40	108,5	
404650BP25	40	46	50	135,7	
405025BP25	40	50	25	118,3	
405032BP25	40	50	32	152,7	
405040BP25	40	50	40	189,3	
405050BP25	40	50	50	239,0	
455128BP25	45	51	28	84,8	
455535BP25	45	55	35	185,9	
455545BP25	45	55	45	237,4	
455628BP25	45	56	28	163,6	
455636BP25	45	56	36	210,4	
455656BP25	45	56	56	327,2	H7
505640BP25	50	56	40	133,9	f7
506032BP25	50	60	32	185,1	
506040BP25	50	60	40	231,4	
506050BP25	50	60	50	289,3	
506063BP25	50	60	63	357,2	
556540BP25	55	65	40	244,0	
556555BP25	55	65	55	335,6	
556570BP25	55	65	70	440,3	
607050BP25	60	70	50	304,9	
607060BP25	60	70	60	409,9	
607090BP25	60	70	90	614,9	
608090BP25	60	80	90	1.324,6	
708090BP25	70	80	90	709,7	
7080120BP25	70	80	120	975,0	
100120120BP25	100	120	120	2.860,0	

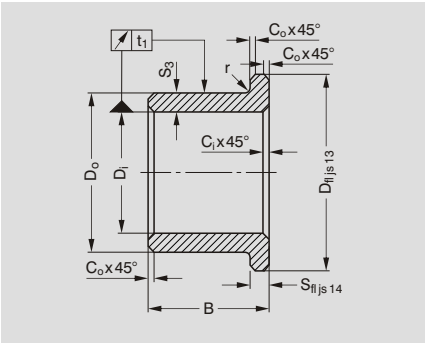
Other dimensions/materials as well as special parts on request.
Note: dividing and shortening is not carried out by GGB.
Tolerances applicable for wall thicknesses <4 mm. For wall thicknesses of 4 mm and more please consult GGB.

Sinterbronze Bearing Material

Self-lubricating (oil-impregnated)

Sinterbronze flanged bushes (similar to Sint A 50)





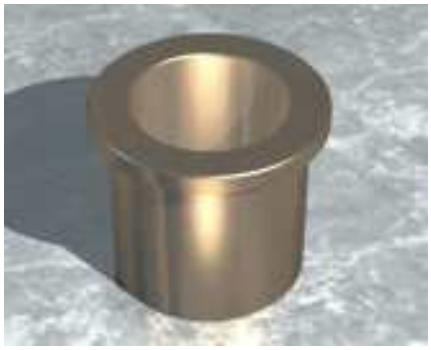
t_1 for $D_i \leq 20$ mm = 60 µm
t_1 for 20 mm < $D_i \leq 35$ mm = 80 µm
t_1 for $D_i > 35$ = 100 µm
chamfers C = (0,1 to 0,2) S_3
minimum 0,2 mm
r = max. 0,3 x S_3
B > 10 ± 1%
B ≤ 10 ± 0,1 mm

Part No.	Technical Data						
GGB	Dimensions						Installation tolerance Housing / Journal
	Inside Ø D_i	Outside Ø D_o	Flange Ø D_{fl}	Width B	Flange width S_{fl}	Weight g	
BB030604BP25	3	6	9	4	1,5	0,9	
BB030606BP25	3	6	9	6	1,5	1,2	
BB030610BP25	3	6	9	10	1,5	1,8	
BB040804BP25	4	8	12	4	2,0	1,8	
BB040808BP25	4	8	12	8	2,0	2,9	
BB040812BP25	4	8	12	12	2,0	3,9	
BB061006BP25	6	10	14	6	2,0	3,0	
BB061010BP25	6	10	14	10	2,0	4,4	
BB061016BP25	6	10	14	16	2,0	6,4	
BB081208BP25	8	12	16	8	2,0	4,5	
BB081212BP25	8	12	16	12	2,0	6,2	
BB081216BP25	8	12	16	16	2,0	7,9	
BB091410BP25	9	14	19	10	2,5	8,2	
BB091414BP25	9	14	19	14	2,5	10,6	
BB101310BP25	10	13	16	10	1,5	9,1	
BB101316BP25	10	13	16	16	1,5	6,5	
BB101320BP25	10	13	16	20	1,5	8,0	
BB101510BP25	10	15	20	10	2,5	8,9	
BB101516BP25	10	15	20	16	2,5	12,8	
BB101520BP25	10	15	20	20	2,5	15,6	
BB101608BP25	10	16	22	8	3,0	10,2	
BB101610BP25	10	16	22	10	3,0	11,8	
BB101616BP25	10	16	22	16	3,0	16,7	
BB121512BP25	12	15	18	12	1,5	5,9	H7 / f7
BB121516BP25	12	15	18	16	1,5	7,8	
BB121520BP25	12	15	18	20	1,5	9,3	
BB121712BP25	12	17	22	12	2,5	11,7	
BB121716BP25	12	17	22	16	2,5	14,8	
BB121720BP25	12	17	22	20	2,5	17,9	
BB121725BP25	12	17	22	25	2,5	21,6	
BB121808BP25	12	18	24	8	3,0	11,5	
BB121812BP25	12	18	24	12	3,0	15,3	
BB121820BP25	12	18	24	20	3,0	22,9	
BB141814BP25	14	18	22	14	2,0	11,1	
BB141818BP25	14	18	22	18	2,0	13,8	
BB141822BP25	14	18	22	22	2,0	16,5	
BB142014BP25	14	20	26	14	3,0	19,4	
BB142018BP25	14	20	26	18	3,0	23,6	
BB142022BP25	14	20	26	22	3,0	27,9	
BB142028BP25	14	20	26	28	3,0	34,4	
BB151916BP25	15	19	23	16	2,0	13,2	
BB151920BP25	15	19	23	20	2,0	16,1	
BB152116BP25	15	21	27	16	3,0	22,7	
BB152120BP25	15	21	27	20	3,0	27,2	
BB152125BP25	15	21	27	25	3,0	33,0	
BB152132BP25	15	21	27	32	3,0	40,9	

Bestell-Nr.	Technical Data						
GGB	Dimensions						Installation tolerance Housing / Journal
	Inside Ø D_i	Outside Ø D_o	Flange Ø D_{fl}	Width B	Flange width S_{fl}	Weight g	
BB162016BP25	16	20	24	16	2,0	14,0	
BB162020BP25	16	20	24	20	2,0	17,2	
BB162025BP25	16	20	24	25	2,0	18,9	
BB162216BP25	16	22	28	16	3,0	24,0	
BB162220BP25	16	22	28	20	3,0	28,6	
BB162225BP25	16	22	28	25	3,0	34,7	
BB162232BP25	16	22	28	32	3,0	40,5	
BB182218BP25	18	22	26	18	2,0	17,1	
BB182222BP25	18	22	26	22	2,0	20,5	
BB182228BP25	18	22	26	28	2,0	25,6	
BB182418BP25	18	24	30	18	3,0	29,0	
BB182422BP25	18	24	30	22	3,0	34,2	
BB182428BP25	18	24	30	28	3,0	42,2	
BB202416BP25	20	24	28	16	2,0	17,0	
BB202420BP25	20	24	28	20	2,0	20,7	
BB202425BP25	20	24	28	25	2,0	25,5	
BB202616BP25	20	26	32	16	3,0	29,0	
BB202620BP25	20	26	32	20	3,0	34,5	
BB202625BP25	20	26	32	25	3,0	40,0	H7 / f7
BB202632BP25	20	26	32	32	3,0	51,8	
BB222718BP25	22	27	32	18	2,5	27,0	
BB222722BP25	22	27	32	22	2,5	32,5	
BB222728BP25	22	27	32	28	2,5	40,0	
BB222825BP25	22	28	34	25	3,0	45,1	
BB222922BP25	22	29	36	22	3,5	49,7	
BB222936BP25	22	29	36	36	3,5	75,8	
BB253020BP25	25	30	35	20	2,5	33,2	
BB253025BP25	25	30	35	25	2,5	40,4	
BB253032BP25	25	30	35	32	2,5	50,6	
BB253220BP25	25	32	39	20	3,5	51,2	
BB253225BP25	25	32	39	25	3,5	61,6	
BB253232BP25	25	32	39	32	3,5	76,3	
BB283622BP25	28	36	44	22	4,0	72,7	
BB283636BP25	28	36	44	36	4,0	106,1	
BB303820BP25	30	38	46	20	4,0	71,4	
BB303825BP25	30	38	46	25	4,0	85,8	
BB303830BP25	30	38	46	30	4,0	100,1	

Other dimensions/materials as well as special parts on request.
Note: dividing and shortening is not carried out by GGB.
Tolerances applicable for wall thicknesses <4 mm. For wall thicknesses of 4 mm and more please consult GGB.

Sinterbronze flanged bushes (similar to Sint A 50)



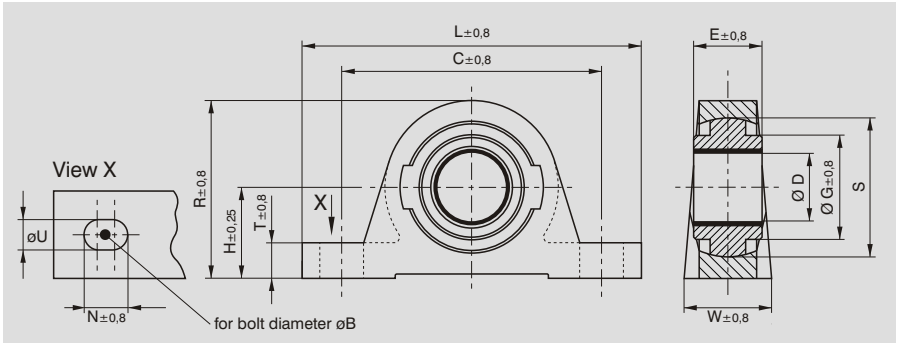
After the bushes have been pressed into a H7 housing hole using an m6 mandrel, cylindrical bushes have an H7 inside diameter (H8 for Ø ≥ 50 mm) and flanged bushes have an H8 inside bush diameter .

Delivery tolerance in accordance with ISO standard F7/s7 for cylindrical bushes (for D_i > 50 mm and D_o > 50 mm F8/s8) and F8/s8 for flanged bushes.

Bestell-Nr.	Technical Data						
GGB	Dimensions						Installation tolerance Housing / Journal
	Inside Ø D_i	Outside Ø D_o	Flange Ø D_{fl}	Width B	Flange width S_{fl}	Weight g	
BB323820BP25	32	38	44	20	3,0	51,9	
BB323825BP25	32	38	44	25	3,0	62,9	
BB323832BP25	32	38	44	32	3,0	78,4	
BB324020BP25	32	40	48	20	4,0	75,5	
BB324025BP25	32	40	48	25	4,0	90,5	
BB324030BP25	32	40	48	30	4,0	99,9	
BB324032BP25	32	40	48	32	4,0	111,8	
BB364522BP25	36	45	54	22	4,5	105,4	
BB364528BP25	36	45	54	28	4,5	128,4	
BB364536BP25	36	45	54	36	4,5	159,1	
BB404625BP25	40	46	52	25	3,0	77,3	
BB404632BP25	40	46	52	32	3,0	96,4	H7 / f7
BB404640BP25	40	46	52	40	3,0	118,2	
BB405025BP25	40	50	60	25	5,0	147,3	
BB405032BP25	40	50	60	32	5,0	180,8	
BB405040BP25	40	50	60	40	5,0	218,4	
BB455145BP25	45	51	57	45	3,0	147,1	
BB505632BP25	50	56	62	32	3,0	118,1	
BB506032BP25	50	60	70	32	5,0	219,5	
BB506040BP25	50	60	70	40	5,0	265,3	
BB506050BP25	50	60	70	50	5,0	323,8	
BB607050BP25	60	70	80	50	5,0	381,4	
BB607060BP25	60	70	80	60	5,0	450,7	

Other dimensions/materials as well as special parts on request.
Note: dividing and shortening is not carried out by GGB.
Tolerances applicable for wall thicknesses <4 mm. For wall thicknesses of 4 mm and more please consult GGB.

PB Pedestal Bearing Housing

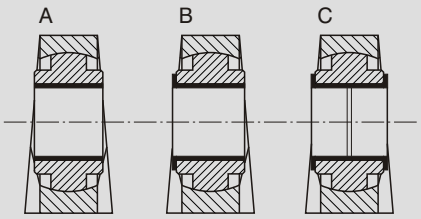


Housing material: GG 20
Ball bearing material: GG 20
Stainless and corrosion-resistant version on request.

Ordering example:

Size Design
PB1-10M-B-DU — Bush material
Pedestal bearing
metric Standard bush D_i

Design:

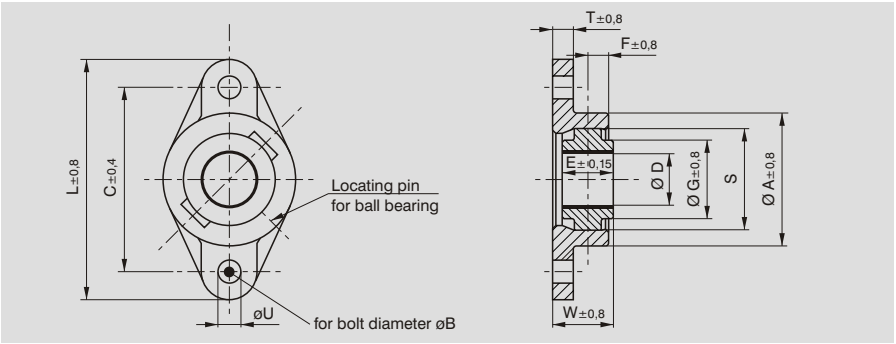


Design BR for axial bearing right

Part No.	Dimension table [mm] EXALIGN™ PB pedestal bearing													
GGB	øU	øB	D*	E	H	C	L	W	T	R	G	N	S	Weight kg
PB1-10M	9,5	8	10	15	28,6	76	102	25	10	56	33,3	13	41,2	0,36
PB1-12M			12	15	28,6	76	102	25	10	56	33,3	13	41,2	0,35
PB1-15M			15	15	28,6	76	102	25	10	56	33,3	13	41,2	0,34
PB2-20M	11,1	10	20	20	33,5	95	124	32	13	65	39,7	16	50,7	0,63
PB2-25M			25	25	33,3	95	124	32	13	65	39,7	16	50,7	0,62
PB3-30M	14,3	12	30	30	41,3	122	159	41	16	81	51,0	22	63,4	1,35
PB4-35M			35	35	49,2	137	183	48	16	102	60,3	22	76,1	1,80
PB4-40M			40	40	49,2	137	183	48	16	102	60,3	22	76,1	1,90
PB5-45M			45	45	54,0	152	194	54	16	113	73,0	22	88,8	3,00
PB6-50M	17,5	16	50	50	61,9	168	214	57	19	122	79,3	22	100,0	3,80
PB7-55M			55	55	66,7	197	247	64	22	135	83,0	22	110,0	4,40
PB7-60M			60	60	66,7	197	247	64	22	135	83,0	22	110,0	5,50
PB7-65M			65	60	66,7	197	247	64	22	135	83,0	22	110,0	5,30
PB8-70M			70	65	71,4	200	254	70	25	143	89,0	22	120,0	6,35
PB8-75M			75	65	71,4	200	254	70	25	143	89,0	22	120,0	5,80
PB9-80M	22,2	20	80	80	87,3	235	295	89	32	175	108,0	27	139,7	10,70
PB9-85M			85	80	87,3	235	295	89	32	175	108,0	27	139,7	10,35
PB10-90M			90	80	101,6	279	330	102	32	206	130,0	30	170,0	17,45
PB10-100M			100	80	101,6	279	330	102	32	206	130,0	30	170,0	16,50

Other dimensions on request.
*Dimension D is with the standard bush pressed in.

DF Flange Bearing Housing

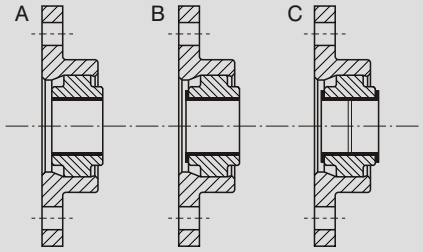


Housing material: GG 20
Ball bearing material: GG 20
Stainless and corrosion-resistant version on request.

Ordering example:

Size Design
DF1-10M-B-DU — Bush material
Pedestal bearing
metric Standard bush D_i

Design:

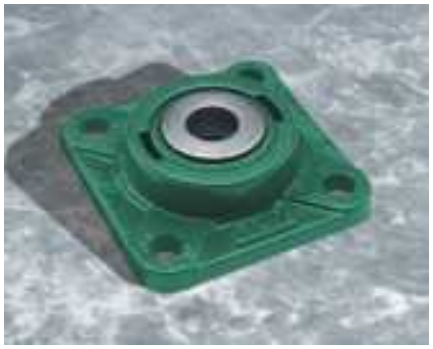


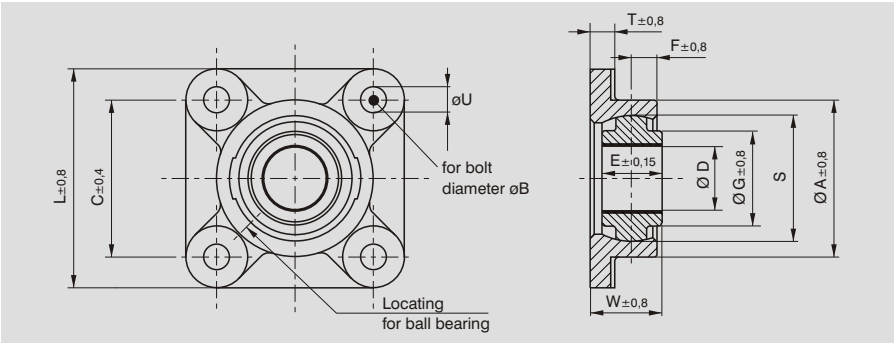
Design BR for axial bearing right

Part No.	Dimension table [mm] EXALIGN™ DF pedestal bearing												
GGB	øU	øB	D*	E	C	L	T	W	A	F	G	S	Weight kg
DF1-10M	9,5	8	10	15	81	103	8	23	54	6	33,3	41,2	0,31
DF1-12M			12	15	81	103	8	23	54	6	33,3	41,2	0,30
DF1-15M			15	15	81	103	8	23	54	6	33,3	41,2	0,29
DF2-20M	11,1	10	20	20	89	116	10	27	64	10	39,7	50,7	0,48
DF2-25M			25	25	89	116	10	30	64	10	39,7	50,7	0,47
DF3-30M	14,3	12	30	30	113	143	11	36	79	13	51,0	63,4	1,00
DF4-35M			35	35	130	159	14	45	95	16	60,3	76,1	1,40
DF4-40M			40	40	130	159	14	45	95	16	60,3	76,1	1,40
DF5-45M			45	45	144	175	16	51	108	16	73,0	88,8	2,30
DF6-50M	17,5	16	50	50	157	190	16	58	117	21	79,3	100,0	2,90
DF7-55M			55	55	184	216	17	62	137	22	83,0	110,0	3,50
DF7-60M			60	60	184	216	17	65	137	22	83,0	110,0	4,30
DF7-65M			65	60	184	216	17	65	137	22	83,0	110,0	4,10
DF8-70M			70	65	202	236	19	71	143	25	89,0	120,0	4,85
DF8-75M			75	65	202	236	19	71	143	25	89,0	120,0	4,50
DF9-80M	22,2	20	80	80	214	259	22	81	171	29	108,0	139,7	7,80
DF9-85M			85	80	214	259	22	81	171	29	108,0	139,7	7,45
DF10-90M			90	80	279	324	25	91	210	32	130,0	170,0	14,25
DF10-100M			100	80	279	324	25	91	210	32	130,0	170,0	13,30

Other dimensions on request.
*Dimension D is with the standard bush pressed in.

FL Flange Bearing Housing



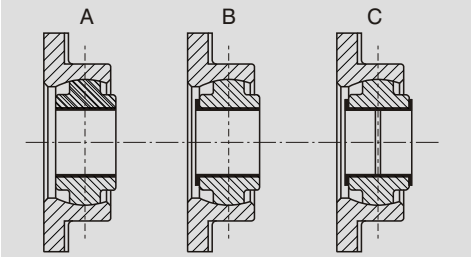


Housing material: GG 20
Ball bearing material: GG 20
Stainless and corrosion-resistant version on request.

Ordering example:

Size Design
FL1-10M-B-DU — Bush material
Pedestal bearing
metric Standard bush D_i

Design:



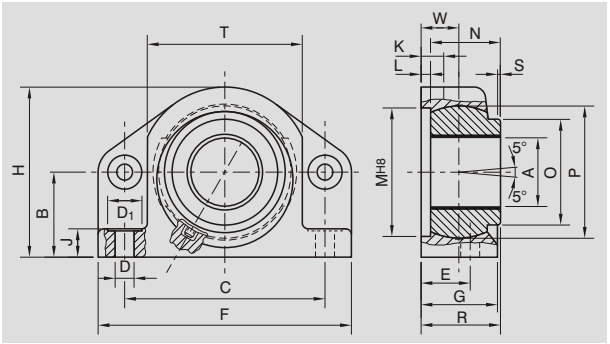
Design BR for axial bearing right

Part No.	Dimension table [mm] EXALIGN™ FL pedestal bearing												
GGB	øU	øB	D*	E	C	L	T	W	A	F	G	S	Weight kg
FL1-10M	9,5	8	10	15	57	76	8	23	54	6	33,3	41,2	0,41
FL1-12M			12	15	57	76	8	23	54	6	33,3	41,2	0,40
FL1-15M			15	15	57	76	8	23	54	6	33,3	41,2	0,39
FL2-20M	11,1	10	20	20	64	89	10	27	64	10	39,7	50,7	0,63
FL2-25M			25	25	64	89	10	30	64	10	39,7	50,7	0,62
FL3-30M	14,3	12	30	30	79	110	11	36	79	13	51,0	63,4	1,15
FL4-35M			35	35	92	121	14	43	95	16	60,3	76,1	1,80
FL4-40M			40	40	92	121	14	45	95	16	60,3	76,1	1,90
FL5-45M			45	45	102	133	16	51	108	16	73,0	88,8	2,70
FL6-50M	17,5	16	50	50	111	143	16	58	117	21	79,3	100,0	3,60
FL7-55M			55	55	130	165	17	62	137	22	83,0	110,0	4,20
FL7-60M			60	60	130	165	17	65	137	22	83,0	110,0	5,20
FL7-65M			65	60	130	165	17	65	137	22	83,0	110,0	5,00
FL8-70M			70	65	143	175	19	71	143	25	89,0	120,0	6,05
FL8-75M			75	65	143	175	19	71	143	25	89,0	120,0	5,70
FL9-80M	22,2	20	80	80	152	197	22	81	171	29	108,0	139,7	9,40
FL9-85M			85	80	152	197	22	81	171	29	108,0	139,7	9,40
FL10-90M			90	80	197	241	25	91	210	32	130,0	170,0	13,95
FL10-100M			100	80	197	241	25	91	210	32	130,0	170,0	16,30

Other dimensions on request.
*Dimension D is with the standard bush pressed in.

UNI™ Bearing Housing

- Standard range
- Universally usable as pedestal and flange bearing housing
- Reduced space
- Shaft Ø range 10 to 100 mm, 5 sizes
- UNI design provides special stiffening
- Can be equipped with all self-aligning bearings from the GGB range
- Also available without bush on request



Note: Dimensions [mm] without statement of tolerances in accordance with DIN 7168m

Dimension table [mm] UNI™ bearing housing

Size	Ø range A	B	C	D	D_1	E	F	G	H	J	K	L	M	N	O	P	R	S	T	W
1	10 - 25	28	72	8,5	13,5	15	95	25	56	12	8	3	46	20	34	42	23	0,5 x 45°	52	11
2	30 - 40	42	104	10,5	18	25	130	41	84	14	14	5	72	40	51	68	45	2 x 45°	83	20
3	45 - 60	60	142	13,5	27	35	180	55	120	20	15	7	92	50	74	95	57	1 x 45°	112	27
4	65 - 80	75	182	17,5	33	45	220	75	150	24	18	10	130	70	96	125	80	1 x 45°	140	37
5	85 - 100	90	222	21	40	50	280	80	180	28	20	10	155	70	125	150	80	-	172	40

Part No.	
GGB Size Ø	Weight kg
1-10	0,495
1-15	0,475
1-20	0,445
1-25	0,415
2-30	1,775
2-35	1,685
2-40	1,580
3-45	4,500
3-50	4,175
3-55	4,175
3-60	3,970
4-65	9,450
4-70	9,090
4-75	8,770
4-80	8,550
5-85	14,570
5-90	14,080
5-95	13,650
5-100	13,250

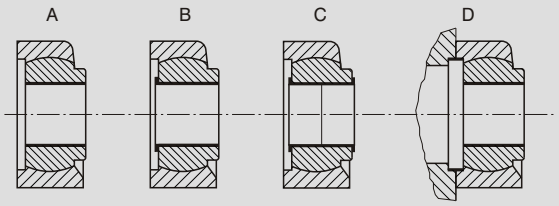
Other dimensions on request.

Housing material: GGG420
Ball bearing material: 16 MnCr5
Corrosion-resistant version on request.

Ordering example:

Size Design
UNI-1-10-B-DU — Bush material
Standard bush D_1

Design:

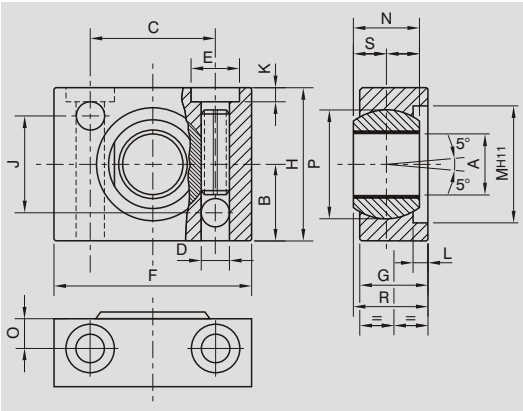


Design BR for axial bearing right

MINI™ Bearing Housing

- Ø range 8 to 15 mm
- Only one housing size
- Universally usable as pedestal and flange bearing housing
- Locking device:
  Pedestal bearing
  - via fastening bolts
  Flange bearing
  - 6 mm clamping pin in one of the 2 pedestal bearing fastening holes
- Can be equipped with self-aligning bearings from the GGB range. Also available without bush on request.

Housing material: AlMgSi12
Ball bearing material: 9SMn28K



Note: Dimensions [mm] without statement of tolerances in accordance with DIN 7168m

Dimension table [mm] MINI™ bearing housing																
Size	Ø range A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	S
0	8 - 15	17,5	28,5	6,4	10,5	45	15	35	22	3	2,5	26	15	6	25	16	7,5

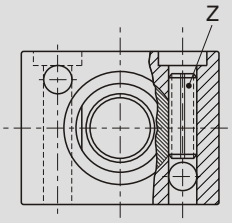
Ordering example:

Size Design
MINI-0-8-BZ-DU — Bush material
Standard bush D_i — Clamping pin

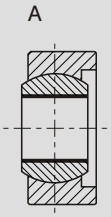
Bestell-Nr.	
GGB Größe Ø	Gewicht g
0 - 8	74,2
0 - 10	70,9
0 - 12	65,7
0 - 15	58,8

Intermediate inside Ø sizes are also available
Other dimensions on request.

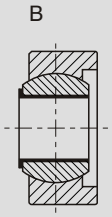
Design:



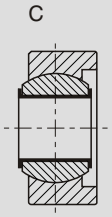
Clamping pin for use as flange bearing housing



Cylindrical bush



Flanged bush



2 flanged bushes

GGB special parts manufactured to customers´ requirements

Due to the constant dialogue with you our customers we found out that many of you have the impression of the bearings in our standard price list being a fixed and inflexible programme.

Our flexibility seemed restricted and limited except the option of splitting and shortening the standard parts to meet the dimensional adjustments of your requirements. Some might even have searched for a different solution.

An other obstacle was built by the opinion that when ordering special parts, one has to face

- extended delivery times
- increased prices
- considerable proportion of the tool costs

and therefore has to order a higher number of pieces. In counselling interviews on our special parts production the remark

"this is also possible?"

often led to future-oriented successful technical solutions.

The manufacturing possibilities of GGB were expanded systematically, parallel to the standard bearing products. That means, we manufacture parts for your specific requirements that are non-standard parts in small amounts / even only one piece if required at interesting prices short-term.

Many times a technically optimised and even efficient solution can be found deviating from our standard programme. Machining techniques well proven in manufacturing thin walled bimetallic strips are primarily applied, such as stamping and water jet cutting for particular shapes. However also other material related machining procedures such as deep drawing and injection moulding are implemented. As a matter of course the special parts manufacturing is valid for the entire GGB product range (metal-polymer, thermoplastic compounds, mono-metallic) and even turned parts.

Therefore you should get in contact with us whenever you need something special in the range of maintenance free and low maintenance plain bearings. We are pleased to support you.

Our products are manufactured under DIN/ISO 14001 und ISO/TS 16949 quality management systems. We also deliver safety parts with factory certifications and test reports for initial samples according to your specifications. GGB is consequently able to detailed advise you on special parts and develop a customised solution.

Shoe mounting guide

Fully finished special strip e.g. with countersinks

Special half bearing

Special washer

Slot bush with flange

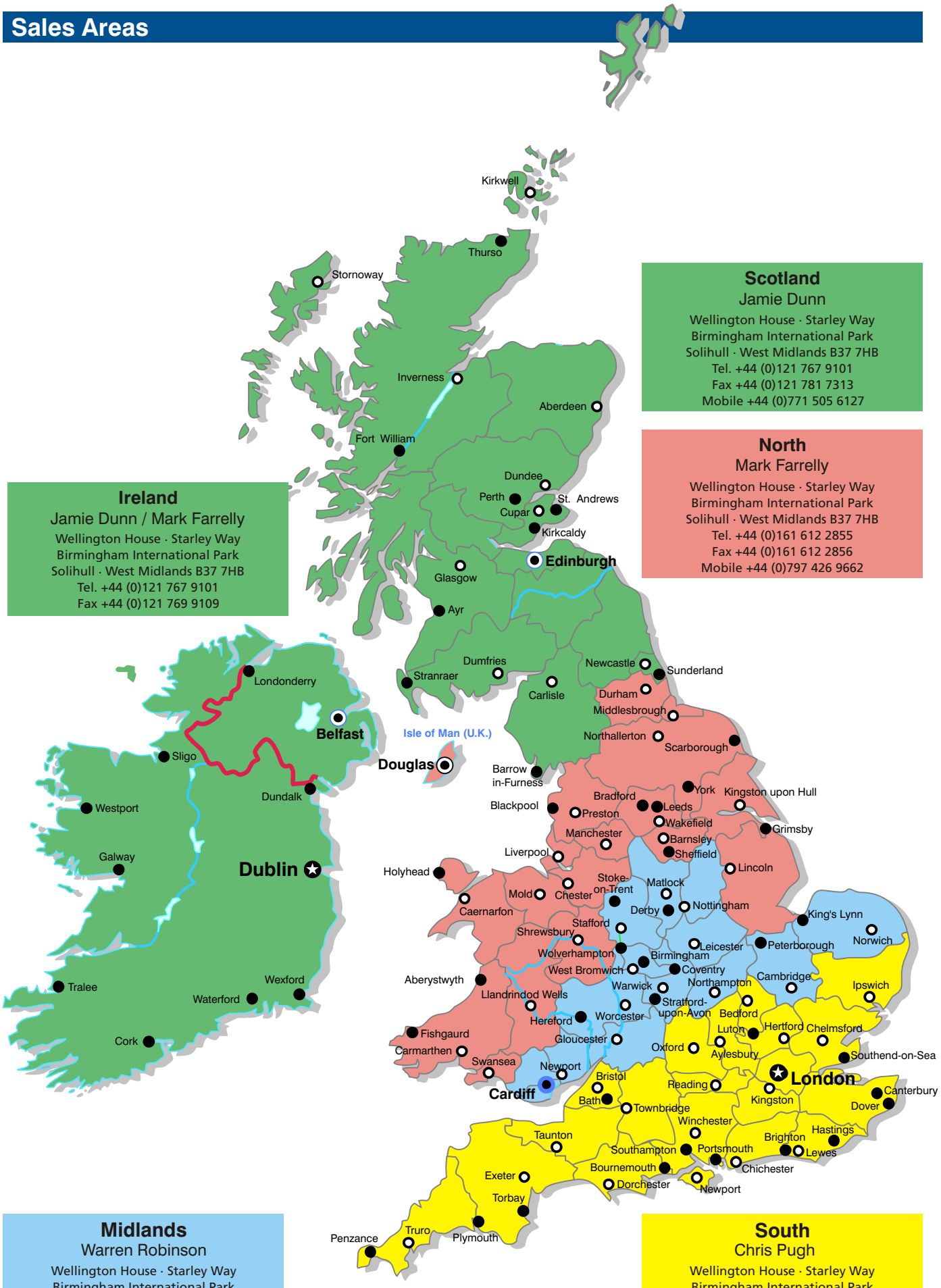
Ball half bearings

Bushing block

Bushing blocks are also available in different sizes
(e.g. 150 mm x 100 mm, rectangular)
Bushing blocks are planar adjusted

Gauge guide, deep-drawn, sliding layer outside

Sales Areas



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Data Sheet

Data for bearing design calculation

GGB BEARING TECHNOLOGY

Application: _____

_____

_____

Project / No.: _____

Quantity: _____ ☐ New Design ☐ Existing Design

Dimensions [mm]		
Inside diameter	D_i	
Outside diameter	D_o	
Length	B	
Outer ring length	B_F	
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 F		
- static	[N]	
- dynamic	[N]	
☐ Axial load F		
- static	[N]	
- dynamic	[N]	
☐ Specific load $\bar{p}$		
- radial	[MPa]	
- axial	[MPa]	

Movement		
Rotational speed	N [1/min]	
Speed	U [ms]	
Length of stroke	L_S [mm]	
Frequency of stroke	[1/min]	
Oscillating cycle	φ [°]	
Oscillating freq.	N_{OSZ} [1/min]	

Mating Surface		
Material		
Hardness	HB/HRC	
Surface finish	Ra [µm]	

Fits and 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]	

Customer Information

Company _____

_____

Street _____

City / Post Code _____

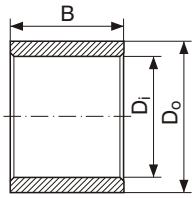
Name _____

Tel. _____ Fax _____

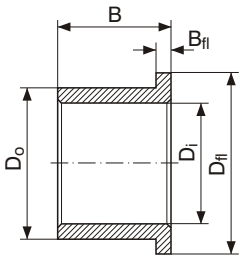
Date / Signature _____

Bearing Type:

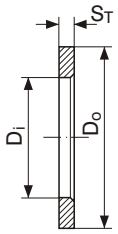
☐ Cylindrical bushing



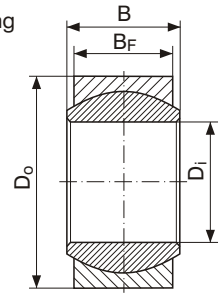
☐ Flanged bushing



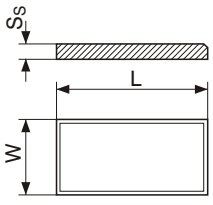
☐ Thrust washer



Spherical bearing
☐ Steady load
☐ Rotating load



☐ Slideplate



☐ Special parts (sketch)

☐ Rotational movement
☐ Steady load
☐ Rotating load
☐ Oscillating movement
☐ Linear movement

Needles are for cacti, porcupines and knitting. But, when it comes to bearings, you're better off with GGB.

Switch from needle bearings to GGB bearings and design smarter.

Smarter designs result when you switch from needle bearings to GGB bearings. That's because our bearings are lighter, have as little as 2/3 the profile of needle bearings and there are no needles, so less can go wrong. GGB bearings also have a greater contact area for higher load capacities and they perform well in oscillation conditions as compared to needle roller bearings. In addition, many GGB bearings require no lubrication and the one-piece design is very cost-effective. So, for smarter designs, use lighter and stronger GGB bearings.

To find out more, visit ***www.GGBearings.com/needle*** *or call your GGB sales representative.*

GGB
BEARING TECHNOLOGY

an EnPro Industries company