



# *PRODUCT RANGE*

*The Global Leader  
in High Performance  
Bearing Solutions*

 **GGB**  
BEARING TECHNOLOGY

an EnPro Industries company

# The GGB Advantage



## Improved energy efficiency

The GGB maintenance-free bearings reduce performance loss and increase efficiency.

## Lower material costs

The slim, compact bearing design provides significant space and weight reductions, and guarantees that your material costs will be lower.

## Less noise and lower system costs

Since they do not contain any moving parts, GGBbearings provide low-noise operation. The slim, one-piece design makes installation easier, reduces installation costs and minimises potential damage during installation.

## Replacement of expensive needle bearings

GGB bearings can replace expensive needle bearings in certain applications, since their larger contact surface has a higher load bearing capacity, better impact resistance and improved performance.

## Comprehensive customer support

As one of the world's leading companies for high-performance bearing solutions, our bearing specialists have the expert knowledge with which innovative, cost-effective and reliable solutions for the most demanding applications can be provided.

As a flexible supplier, we also provide short delivery times for the industry's biggest range of high-performance bearings.



## Environmentally friendly

The low-cost, lead-free GGB bearings comply with environmental legislation, which is becoming increasingly stricter, such as the RoHS directive, which restricts the use of hazardous substances in electrical and electronic equipment.





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# EnPro Industries, Inc.

is a leading manufacturer of plain bearings, sealing products, compressor components and other applied products. EnPro Industries delivers products for high demanding applications to all industries worldwide.

Besides GGB, Technetics Group, Stemco, Garlock, Fairbanks Morse Engine and CPI are part of EnPro Industries.

- Registered office in Charlotte, North Carolina
- Annual sales in 2011: 1,11 Billion USD
- 5,000 employees
- 43 production facilities globally
- more than 50,000 customers in over 100 countries worldwide

[www.enproindustries.com](http://www.enproindustries.com)

## Brazil



## China



## Germany



## France



## Slovakia



## USA



These certificates are also available for download on our website [www.ggbearings.com/certificates](http://www.ggbearings.com/certificates)



## 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 2012 (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, DU-B, DB, 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. 1907/2006 of December 18, 2006.

DP4™, DP4-B™, DU®, DU-B™, DP10™, DP11™, DP31™, DX®, DX®10, HI-EX®, SY™, SP™, DS™, EP™, EP12™, EP22™, EP43™, EP44™, EP63™, EP64™, EP73™, EP79™, Glacetal KA™, Multilube®, Multifil™, DB™, GAR-MAX®, HSG™, GAR-FIL®, MLG™, HPM™, HPM™, SBC™, MEGALIFE®, UNI™, MINI™, Sical 3™, Sical 3D™ and Sical 6™ are trademarks of GGB

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

# Product Range

## Summary of Bearing Materials and Products

Material name	Metal-Polymer Materials	Working conditions	Page
DP4™	St + porous bronze sinter + PTFE + fillers	self lubricating, low-maintenance	8
DP4-B™	Bz + porous bronze sinter + PTFE + fillers	self lubricating, corrosion resistant	8
DU®	St + porous bronze sinter + PTFE + Pb	self lubricating	8
DU-B™	Bz + porous bronze sinter + PTFE + Pb	self lubricating, corrosion resistant	10
DP10™	St + porous bronze sinter + PTFE + solid lubricants	self lubricating, low-maintenance	10
DP11™	St + porous bronze sinter + PTFE + solid lubricants + fillers	self lubricating, low-maintenance	10
DP31™	St + porous bronze sinter + PTFE + fluoropolymer + fillers	low-maintenance	12
DX®	St + porous bronze sinter + POM with lubrication indents	low-maintenance	12
<b>DX10</b> with 	St + porous bronze sinter + high tech polymer with or without lubrication indents	low-maintenance	12
HI-EX®	St + porous bronze sinter + PEEK + PTFE + fillers	low-maintenance	14
DS™	St + porous bronze sinter + POM modified	self lubricating, low-maintenance	14

Material name	Solid Polymer Materials	Working conditions	Page
EP™	PA6.6T + glass fibres + PTFE + graphite	self lubricating	14
EP12™	POM + PTFE	self lubricating	16
EP22™	PBT + PTFE	self lubricating	16
EP43™	PPS + PTFE + aramid	self lubricating	16
EP44™	PPS + PTFE + carbon fibres	self lubricating	18
EP63™	PEEK + PTFE + aramid	self lubricating	18
EP64™	PEEK + PTFE + graphite + carbon fibres	self lubricating	18
EP73™	PAI + graphite + PTFE	self lubricating	20
EP79™	PAI + carbon fibres + PTFE	self lubricating	20
Glacetal KA™	POM	self lubricating, low-maintenance	20
Multilube®	Proprietary injection molded engineering thermoplastic	self lubricating	22

Material name	Filament Wound Materials	Working conditions	Page
GAR-MAX®	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	22
HSG™ High-Strength GAR-MAX®	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	22
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	24

# Product Range

## Summary of Bearing Materials and Products

Material name	Filament Wound Materials cont.	Working conditions	Page
<b>MEGALIFE® XT</b>	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	24
<b>GAR-FIL®</b>	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	self lubricating	24
<b>MLG™</b>	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
<b>HPM™</b>	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	26
<b>HPF™</b>	Sliding layer: Proprietary filled PTFE tape liner Backing: Continuous woven fiberglass cloth laminate impregnated and cured with epoxy resin	self lubricating	26
<b>Multifil™</b>	PTFE + proprietary filler system	self lubricating	28

Material name	Bearing Blocks	Working conditions	Page
<b>Bearing Blocks</b>	<b>Bearing blocks made from aluminium alloys</b> for use with different GGB cylindrical bushes	depends on used bearing material	28

Material name	Mono- and Bimetal Materials	Working conditions	Page
<b>DB™</b>	<b>Dry bearing material</b> Cast bronze + solid lubricant inserts	self lubricating	28
<b>Sintered Bronze Bearings</b>	<b>Bronze sinter impregnated with oil</b> similar to Sint A50, impregnation group 1	self lubricating (impregnated with oil)	30
<b>Machined Bronze Bearings</b> <small>acc. to ISO 4379</small>	<b>Solid bronze alloy bearings</b>	conventional lubrication	30
<b>SY™</b>	<b>Steel-lead-bronze-compound material</b> St + CuPb10Sn10 with lubrication indents	low-maintenance	30
<b>SP™</b>	<b>Steel-lead-bronze-compound material</b> St + CuPb26Sn2	low-maintenance	32

Material name	Complementary Materials	Working conditions	Page
<b>EXALIGN™, UNI™ and MINI™ bearing housings</b>	Self-aligning bearing housings	self lubricating initial lubrication	32 34

## Standard Stock Bearings

<b>Standard Stock Bearings</b>		
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# Product Range

## DP4™



Cylindrical bushes



Flanged bushes



Thrust washers



Flanged washers



Strips

### 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

### Availability

#### Ex stock:

Cylindrical bushes, flanged bushes, thrust washers, flanged washers and strip

#### To order:

Non-standard parts

### Usage

dry	<b>good</b>
oil lubricated	<b>very good</b>
grease lubricated	<b>good</b>
water lubricated	<b>fair</b>
process fluid lubricated	<b>good</b>

## DP4-B™



Cylindrical bushes



Flanged bushes



Thrust washers



Flanged washers



Strips

### 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-B™ offers benefits in applications where corrosion of the lead in DU® may occur
- DP4-B™ offers improved wear and friction performance along with good chemical resistance compared to DU®

### Dry conditions

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

### Availability

#### Ex stock:

Standard cylindrical bushes, flanged bushes and strip partly

#### To order:

Thrust washers, flanged washers and non-standard parts

### Usage

dry	<b>good</b>
oil lubricated	<b>very good</b>
grease lubricated	<b>good</b>
water lubricated	<b>good</b>
process fluid lubricated	<b>good</b>

## DU®



Cylindrical bushes



Flanged bushes



Thrust washers



Flanged washers



Strips

### 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

### Availability

#### Ex stock:

Standard cylindrical bushes, roll-formed bushes, flanged bushes, thrust washers, flanged washers, strip

#### To order:

Non-standard parts

### Usage

dry	<b>very good</b>
oil lubricated	<b>good</b>
grease lubricated	<b>fair</b>
water lubricated	<b>fair</b>
process fluid lubricated	<b>fair</b>



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

#### Possible Applications

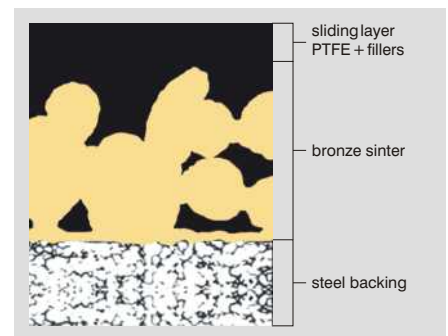
**Automotive:** Braking systems, clutches, gearbox and transmissions, hinges: door, bonnet, boot, cabriolet roof tops, pedals; pumps: axial piston, radial piston, gear and vane; seat mechanisms, steering systems, struts and shock absorbers, wiper systems, etc.

**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.

## DP4™

### Metal-polymer material

Steel + porous bronze sinter + PTFE + fillers



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

#### Possible Applications

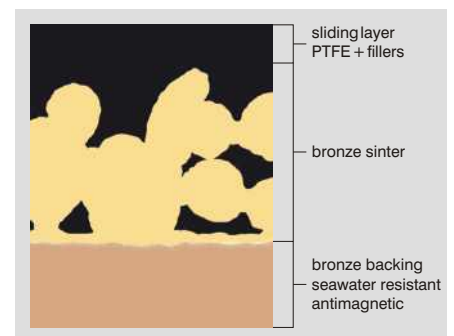
**Automotive:**  
see DU-B™

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

## DP4-B™

### Metal-polymer material

Steel + porous bronze sinter + PTFE + fillers



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

#### 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.

## DU®

### Metal-polymer material

Steel + porous bronze sinter + PTFE + Pb



# Product Range

## DU-B™



Cylindrical bushes



Flanged bushes



Thrust washers



Flanged washers



Strips

### 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

### Availability

#### Ex stock:

Standard cylindrical bushes, flanged bushes and strip

#### To order:

Thrust washers, flanged washers and non-standard parts

### Usage

dry	<b>very good</b>
oil lubricated	<b>good</b>
grease lubricated	<b>fair</b>
water lubricated	<b>good</b>
process fluid lubricated	<b>fair</b>

## DP10™



Cylindrical bushes



Flanged bushes



Thrust washers



Strips



Special parts

### 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

### 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

### Usage

dry	<b>good</b>
oil lubricated	<b>good</b>
grease lubricated	<b>fair</b>
water lubricated	<b>not recommended</b>
process fluid lubricated	<b>fair</b>

## DP11™



Cylindrical bushes



Flanged bushes



Thrust washers



Strips



Special parts

### 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
- Very good dry wear resistance and low friction performance under 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

### Usage

dry	<b>good</b>
oil lubricated	<b>good</b>
grease lubricated	<b>fair</b>
water lubricated	<b>not recommended</b>
process fluid lubricated	<b>fair</b>

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

#### Possible Applications

**Industrial:**  
see DU®

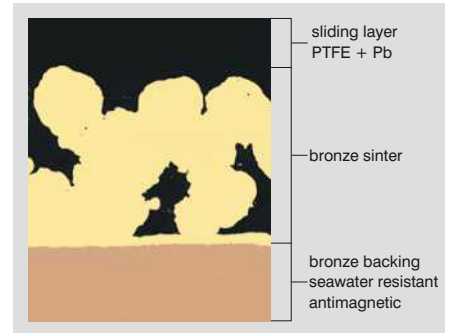
#### Others:

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

## DU-B™

### Metal-polymer material

Bronze + porous bronze sinter + PTFE + Pb



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

#### 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:

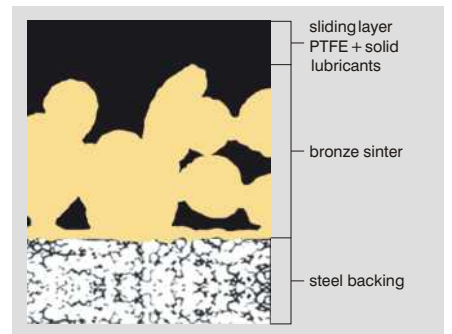
Agricultural equipment, compressors: scroll

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.

## DP10™

### Metal-polymer material

Steel + porous bronze sinter + PTFE + solid lubricants



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

#### Possible Applications

##### Automotive:

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

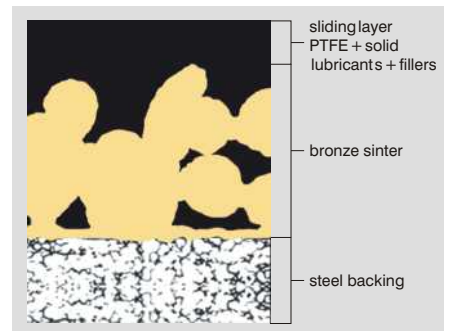
##### Industrial:

Applications with high frequency and low amplitude oscillating movements

## DP11™

### Metal-polymer material

Steel + porous bronze sinter + PTFE + solid lubricants + fillers



# Product Range

## DP31™



Cylindrical bushes



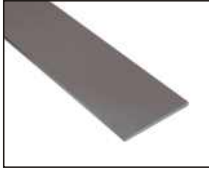
Flanged bushes



Thrust washers



Flanged washers



Strips

### Features

- ECompliant 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

### Availability

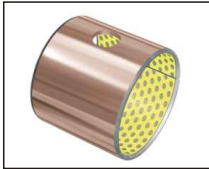
#### To order:

Cylindrical bushes, flanged bushes, thrust washers, flanged washers, strip, non-standard parts

#### Usage

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

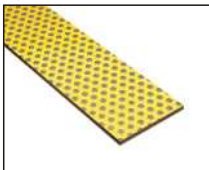
## DX®



Cylindrical bushes



Thrust washers



Strips

### 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

### Availability

#### Ex stock:

Cylindrical standard bushes, roll-formed bushes, thrust washers and strip

#### To order:

Non-standard parts

#### Usage

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

## DX®10



Cylindrical bushes



Thrust washers



Strips



Special parts

### 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

### Availability

#### To order:

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

#### Usage

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

**DX10** with  
**DuraStrong™**  
technology

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	250
	- dynamic	MPa	140
Maximum sliding speed v	- oil lubricated	m/s	10.0
Maximum $\bar{p}v$ factor	- oil lubricated	MPa 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		$\mu\text{m}$	$\leq 0,05 - \leq 0,4^*$
Shaft hardness		HB	>200

\* depending on operating conditions

#### 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.

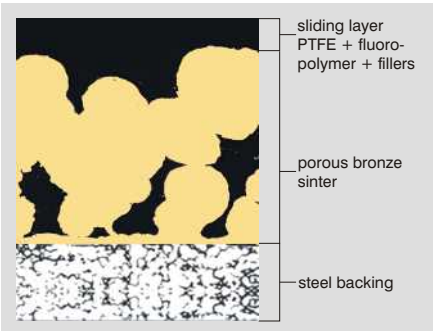
##### Industrial:

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

## DP31™

### Metal polymer material

Steel + porous bronze sinter + PTFE + fluoropolymer + fillers



Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	140
	- dynamic	MPa	70
Maximum sliding speed v	- greased	m/s	2.5
Maximum $\bar{p}v$ factor	- greased	MPa 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		$\mu\text{m}$	$\leq 0.4$
Shaft hardness	- normal	HB	>200
	- for service life >2000 hours	HB	>350

#### Possible Applications

##### Automotive:

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

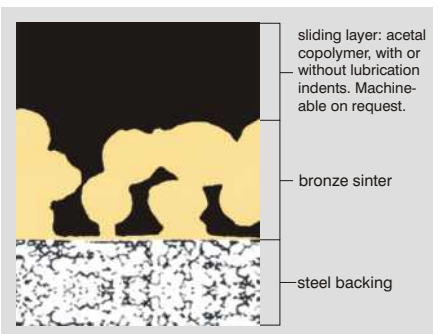
##### Industrial:

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

## DX®

### Metal-polymer material

Steel + porous bronze sinter + POM with lubrication indents



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

#### Possible Applications

##### General

Greased or oiled applications with high load, high temperature, and contamination; ideal for replacing Bi-metal or Bronze bushings to achieve improved wear performance

##### Automotive:

Kingpins, oil pumps, suspension joints

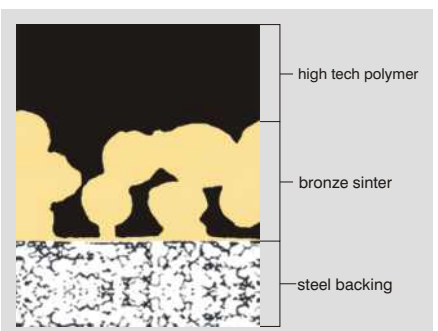
##### Industrial:

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

## DX® 10

### Metal-polymer material

Steel + porous bronze sinter + high tech polymer





# Product Range

## HI-EX®



Cylindrical bushes



Thrust washers



Strips

### 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

### Availability

#### To order:

Cylindrical bushes, thrust washers, strip and non-standard parts

#### Usage

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

## DS™



Buchsen



Anlaufscheiben



Streifen

### 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

### Availability

#### To order:

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

#### Usage

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

## EP™



Cylindrical bushes



Flanged bushes



Thrust washers

### 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

### Availability

#### Ex stock:

Cylindrical bushes and flanged bushes

#### To order:

Non-standard parts

#### Usage

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

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	140
	- dynamic	MPa	100
Maximum sliding speed v	- greased	m/s	2.5
	- oil lubricated	m/s	10.0
Maximum $\bar{p}v$ factor	- greased	MPa 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	HB	>200
	- for service life >2000 hours	HB	>350

### Possible Applications

#### Automotive:

Diesel fuel pumps, gear pumps, ABS equipment

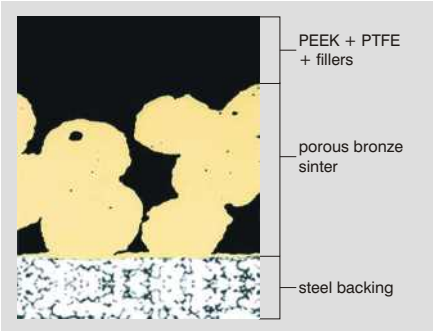
#### Industrial:

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

## HI-EX®

### Metal-polymer material

Steel + porous bronze sinter + PEEK + PTFE + fillers



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

### Possible Applications

#### Automotive:

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

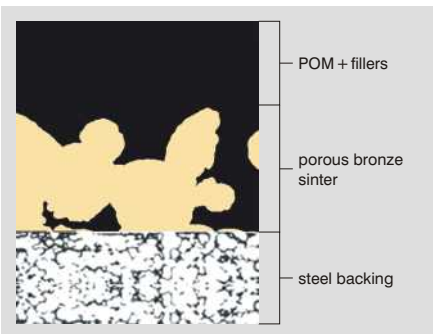
#### Industrial:

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

## DS™

### Metal-polymer material

Steel + porous bronze sinter + POM modified



Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	80
Maximum sliding speed v	- dry	m/s	1.0
Maximum $\bar{p}v$ factor*	- for $A_H/A_C = 5$	MPa x m/s	0.06
	- for $A_H/A_C = 10$	MPa x m/s	0.24
	- for $A_H/A_C = 20$	MPa x m/s	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	$0.5 \pm 0.3$
Shaft hardness		HV	>200

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

### Possible Applications

Generally applicable within the limits of the material properties.

#### Industrial:

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

## EP™

### Solid polymer material

PA6.6T + PTFE + glass fibres + graphite



# Product Range

## EP12™



Cylindrical bushes



Flanged bushes



Thrust washers



Special parts

### Features

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

### Availability

#### To order:

Bushes, special dimensions and shapes

### Usage

dry	<b>very good</b>
oil lubricated	<b>good</b>
grease lubricated	<b>good</b>
water lubricated	<b>fair</b>
process fluid lubricated	<b>good after resistance testing</b>

## EP22™



Cylindrical bushes



Flanged bushes



Thrust washers



Special parts

### Features

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

### Availability

#### Ex stock:

Cylindrical bushes and flanged bushes

#### To order:

Non-standard parts

### Usage

dry	<b>very good</b>
oil lubricated	<b>good</b>
grease lubricated	<b>good</b>
water lubricated	<b>very good</b>
process fluid lubricated	<b>good after resistance testing</b>

## EP43™



Cylindrical bushes



Flanged bushes



Thrust washers



Special parts

### 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

### Availability

#### Ex stock:

Cylindrical bushes and flanged bushes

#### To order:

Non-standard parts

### Usage

dry	<b>very good</b>
oil lubricated	<b>good</b>
grease lubricated	<b>good</b>
water lubricated	<b>very good</b>
process fluid lubricated	<b>good after resistance testing</b>

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	65
Maximum sliding speed v	- dry	m/s	1.0
Maximum $\bar{p}v$ factor*	- for $A_H/A_C = 5$	MPa x m/s	0.04
	- for $A_H/A_C = 10$		0.09
	- for $A_H/A_C = 20$		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	$0.3 \pm 0.2$
Shaft hardness		HV	>200

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

#### Possible Applications

Generally applicable within the limits of the material properties.

#### Industrial:

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

## EP12™

Solid polymer material  
POM + PTFE



Injection moulded thermoplastic dry bearing material with additives homogeneously mixed in

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	50
Maximum sliding speed v	- dry	m/s	1.0
Maximum $\bar{p}v$ factor*	- for $A_H/A_C = 5$	MPa x m/s	0.05
	- for $A_H/A_C = 10$		0.10
	- for $A_H/A_C = 20$		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	$0.3 \pm 0.2$
Shaft hardness		HV	>200

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

#### Possible Applications

Generally applicable within the limits of the material properties.

#### Industrial

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

#### Automotive:

Pedal bearings, steering columns, axles

## EP22™

Solid polymer material  
PBT + PTFE



Injection moulded thermoplastic dry bearing material with additives homogeneously mixed in

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	83
Maximum sliding speed v	- dry	m/s	1.0
Maximum $\bar{p}v$ factor*	- for $A_H/A_C = 5$	MPa x m/s	0.22
	- for $A_H/A_C = 10$		0.90
	- for $A_H/A_C = 20$		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	$0.5 \pm 0.3$
Shaft hardness		HV	>200

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

#### 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

## EP43™

Solid polymer material  
PPS + PTFE + Aramid



Injection moulded thermoplastic dry bearing material with additives homogeneously mixed in

# Product Range

## EP44™



Cylindrical bushes



Flanged bushes



Thrust washers



Special parts

### Features

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

### Availability

#### To order:

Bushes, special dimensions and shapes

#### Usage

dry	<b>good</b>
oil lubricated	<b>very good</b>
grease lubricated	<b>very good</b>
water lubricated	<b>very good</b>
process fluid lubricated	<b>good after resistance testing</b>

## EP63™



Cylindrical bushes



Flanged bushes



Thrust washers



### 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

### Availability

#### Ex stock:

Cylindrical bushes and flanged bushes

#### To order:

Non-standard parts

#### Usage

dry	<b>good</b>
oil lubricated	<b>good</b>
grease lubricated	<b>good</b>
water lubricated	<b>fair</b>
process fluid lubricated	<b>good after resistance testing</b>

## EP64™



Cylindrical bushes



Flanged bushes



Thrust washers



Special parts

### 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

### Availability

#### To order:

Bushes, special dimensions and shapes

#### Usage

dry	<b>good</b>
oil lubricated	<b>very good</b>
grease lubricated	<b>very good</b>
water lubricated	<b>good</b>
process fluid lubricated	<b>good after resistance testing</b>



Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	95
Maximum sliding speed v	- dry	m/s	1.0
Maximum $\bar{p}v$ factor*	- for $A_H/A_C = 5$	MPa x m/s	0.11
	- for $A_H/A_C = 10$		0.42
	- for $A_H/A_C = 20$		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	$0.5 \pm 0.3$
Shaft hardness		HV	>450

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

#### Possible Applications

Generally applicable within the limits of the material properties.

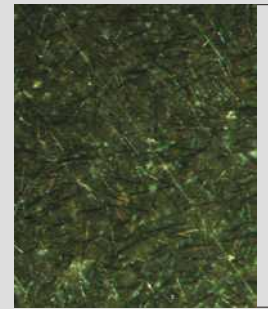
#### Industrial:

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

## EP44™

### Solid polymer material

PPS + PTFE + carbon fibres



Injection moulded thermoplastic dry bearing material with additives homogeneously mixed in

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	90
Maximum sliding speed v	- dry	m/s	1.0
Maximum $\bar{p}v$ factor*	- for $A_H/A_C = 5$	MPa x m/s	0.16
	- for $A_H/A_C = 10$		0.66
	- for $A_H/A_C = 20$		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	$0.3 \pm 0.2$
Shaft hardness		HV	>200

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

#### Possible Applications

Generally applicable within the limits of the material properties.

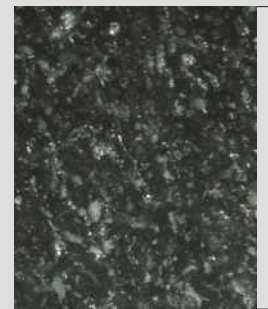
#### Industrial:

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

## EP63™

### Solid polymer material

PEEK + PTFE + Aramid



Injection moulded thermoplastic dry bearing material with additives homogeneously mixed in

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	125
Maximum sliding speed v	- dry	m/s	1.0
Maximum $\bar{p}v$ factor*	- for $A_H/A_C = 5$	MPa x m/s	0.09
	- for $A_H/A_C = 10$		0.35
	- for $A_H/A_C = 20$		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	$0.3 \pm 0.2$
Shaft hardness		HV	>450

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

#### Possible Applications

Generally applicable within the limits of the material properties.

#### Industrial:

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

## EP64™

### Solid polymer material

PEEK + PTFE + graphite + carbon fibres



Injection moulded thermoplastic dry bearing material with additives homogeneously mixed in

# Product Range

## EP73™



Cylindrical bushes



Flanged bushes



Thrust washers



Special parts

### 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

### Availability

#### To order:

Bushes, special dimensions and shapes

#### Usage

dry	<b>good</b>
oil lubricated	<b>good</b>
grease lubricated	<b>good</b>
water lubricated	<b>fair</b>
process fluid lubricated	<b>good after resistance testing</b>

## EP79™



Cylindrical bushes



Flanged bushes



Thrust washers



Special parts

### 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

### Availability

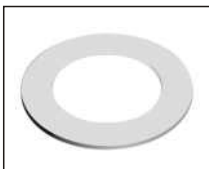
#### To order:

Bushes, special dimensions and shapes

#### Usage

dry	<b>not suitable</b>
oil lubricated	<b>very good</b>
grease lubricated	<b>very good</b>
water lubricated	<b>fair</b>
process fluid lubricated	<b>good after resistance testing</b>

## Glacetal KA™



Thrust washers

### Features

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

### Availability

#### Ex stock:

Thrust washers

#### Usage

dry	<b>fair</b>
oil lubricated	<b>good</b>
grease lubricated	<b>good</b>
water lubricated	<b>fair</b>
process fluid lubricated	<b>fair</b>

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	105
Maximum sliding speed $v$	- dry - lubricated	m/s	2.5 5.0
Maximum $\bar{p}v$ factor*	- for $A_H/A_C = 5$ - for $A_H/A_C = 10$ - for $A_H/A_C = 20$	MPa 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 $R_a$		$\mu\text{m}$	$0.5 \pm 0.3$
Shaft hardness		HV	>200

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

#### 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

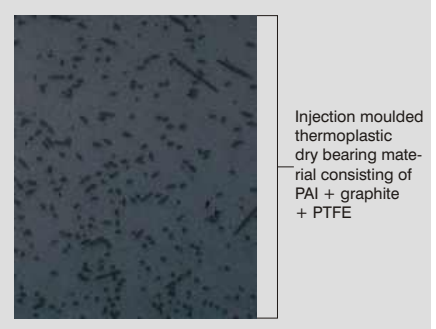
#### Other:

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.

## EP73™

**Solid polymer material**  
PAI + graphite + PTFE



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

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	130
Maximum sliding speed $v$	- lubricated	m/s	10
Maximum $\bar{p}v$ factor	- lubricated	MPa 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 $R_a$		$\mu\text{m}$	$0.5 \pm 0.3$
Shaft hardness		HV	>500

#### 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

## EP79™

**Solid polymer material**  
PAI + carbon fibres + PTFE



Injection moulded thermoplastic bearing material with additives homogeneously mixed in

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	20
	- dynamic	MPa	10
Maximum sliding speed $v$	- greased	m/s	1.5
Maximum $\bar{p}v$ factor	- greased	MPa 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 $R_a$		$\mu\text{m}$	$\leq 0.4$
Shaft hardness	- normal	HB	>200
	- for service life >2000 hours	HB	>350

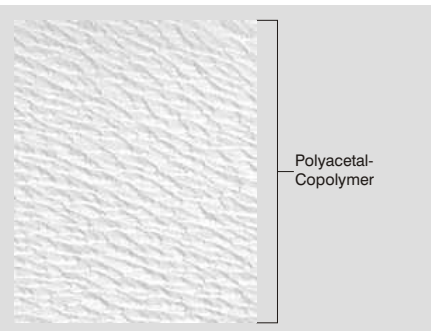
#### Possible Applications

#### 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

## Glacetal KA™

**Solid polymer material**  
POM



Polyacetal-Copolymer

# Product Range

## Multilube®



Cylindrical bushes



Flanged bushes



Special parts



### Features

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

### Availability

#### To order:

Injection moulding allows for a diverse range of shapes and sizes

#### Usage

dry	<b>good</b>
oil lubricated	<b>good</b>
grease lubricated	<b>good</b>
water lubricated	<b>fair</b>
process fluid lubricated	<b>fair</b>

## GAR-MAX®



Cylindrical bushes

### Features

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

### Availability

#### Ex stock:

Cylindrical standard bushes partly available

#### To order:

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

#### Usage

dry	<b>very good</b>
oil lubricated	<b>fair</b>
grease lubricated	<b>fair</b>
water lubricated	<b>fair</b>
process fluid lubricated	<b>poor</b>

## HSG™



Cylindrical bushes

### 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

### Availability

#### To order:

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

#### Usage

dry	<b>very good</b>
oil lubricated	<b>fair</b>
grease lubricated	<b>fair</b>
water lubricated	<b>fair</b>
process fluid lubricated	<b>fair</b>

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	60
	- dynamic		30
Maximum sliding speed v	- dry	m/s	1.5
Maximum $\bar{p}v$ factor	- dry	MPa x m/s	0.6
Maximum 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	HB	>200
	- for service life >2000 hours		>350

**Possible Applications**

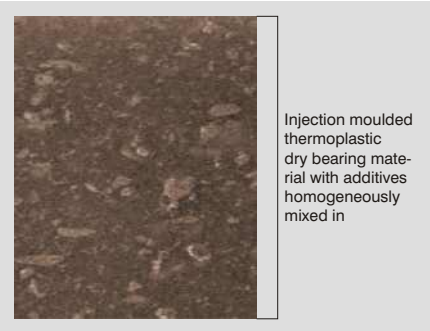
**Industrial:**

Linkages, seat suspensions

**Multilube®**

**Solid polymer material**

Proprietary injection moulded engineering thermoplastic



Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	210
	- dynamic		140
Maximum sliding speed v	- dry	m/s	0.13
Maximum $\bar{p}v$ factor	- dry	MPa x m/s	1.05
Maximum 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	HB	>350
	- for service life >2000 hours		>480

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

**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.

**GAR-MAX®**

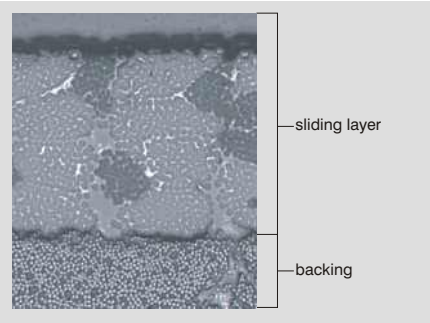
**Filament wound material**

**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.



Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	415
	- dynamic		140
Maximum sliding speed v	- dry	m/s	0.13
Maximum $\bar{p}v$ factor	- dry	MPa x m/s	1.05
Maximum 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	HB	>350
	- for service life >2000 hours		>480

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

**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.

**HSG™**

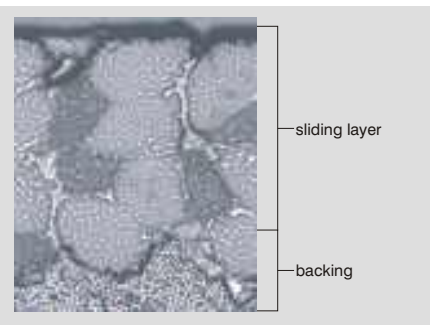
**Filament wound material**

**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





# Product Range

## SBC™ Sealed Bearing Cartridges



Cylindrical bushes



Cylindrical bushes with steel sleeves

### Features

- Self-lubricating
- High static load capability
- 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

### Availability

#### To order:

Cylindrical bushes, optionally available in a steel outer shell

### Usage

dry	<b>very good</b>
oil lubricated	<b>fair</b>
grease lubricated	<b>fair</b>
water lubricated	<b>fair</b>
process fluid lubricated	<b>fair</b>

## MEGALIFE® XT



Thrust washers

### 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

### 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.

### Usage

dry	<b>very good</b>
oil lubricated	<b>fair</b>
grease lubricated	<b>poor</b>
water lubricated	<b>very good</b>
process fluid lubricated	<b>fair</b>

## GAR-FIL®



Cylindrical bushes

### 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

### Availability

#### To order:

Cylindrical bushes

### Usage

dry	<b>very good</b>
oil lubricated	<b>very good</b>
grease lubricated	<b>fair</b>
water lubricated	<b>fair</b>
process fluid lubricated	<b>very good</b>

Bearing properties	Units	Value GAR-MAX	Value HSG
Maximum load $\bar{p}$ - static - dynamic	MPa	210 140	415 140
Maximum sliding speed v	m/s	0.13	0.13
Maximum $\bar{p}v$ factor	MPa 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 - normal - for service life >2000 hours	HB	>350 >480	>350 >480

### 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.

## SBC™ Sealed Bearing Cartridges

### Filament wound 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.

Bearing properties	Units	Value
Maximum load $\bar{p}$ - static - dynamic	MPa	140 140
Maximum sliding speed v	m/s	0.5
Maximum $\bar{p}v$ factor	MPa x m/s	1.23
Maximum temperature $T_{max}$	°C	+175
Minimum temperature $T_{min}$	°C	-195
Coefficient of friction f	-	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.

### Possible Applications

#### Industrial:

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

## MEGALIFE® XT

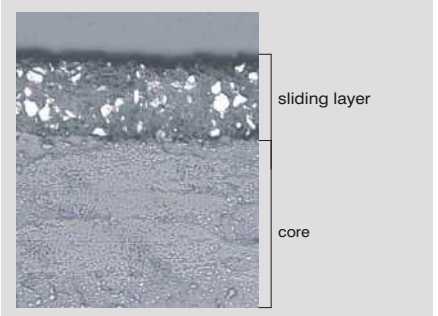
### Filament wound material

#### 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



Bearing properties	Units	Value
Maximum load $\bar{p}$ - static - dynamic	MPa	140 140
Maximum sliding speed v	m/s	2.5
Maximum $\bar{p}v$ factor	MPa x m/s	1.23
Maximum temperature $T_{max}$	°C	+205
Minimum temperature $T_{min}$	°C	-195
Coefficient of friction f	-	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.

### Possible Applications

#### Industrial:

Toggle linkages, earthmoving equipment, valves

## GAR-FIL®

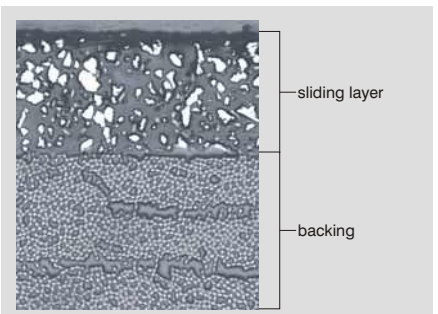
### Filament wound material

#### 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



# Product Range

## MLG™



Cylindrical bushes

### 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

### Availability

#### To order:

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

### Usage

dry	<b>very good</b>
oil lubricated	<b>good</b>
grease lubricated	<b>poor</b>
water lubricated	<b>fair</b>
process fluid lubricated	<b>fair</b>

## HPM™



Cylindrical bushes

### 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

### Availability

#### To order:

Cylindrical bearings up to 500 mm

### Usage

dry	<b>very good</b>
oil lubricated	<b>fair</b>
grease lubricated	<b>poor</b>
water lubricated	<b>very good</b>
process fluid lubricated	<b>fair</b>

## HPF™



Strips

### 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

### 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)

### Usage

dry	<b>very good</b>
oil lubricated	<b>very good</b>
grease lubricated	<b>poor</b>
water lubricated	<b>very good</b>
process fluid lubricated	<b>good</b>

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	210
	- dynamic		140
Maximum sliding speed v	- dry	m/s	0.13
Maximum $\bar{p}v$ factor	- dry	MPa x m/s	1.05
Maximum 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.

#### Possible Applications

##### Industrial:

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

## MLG™

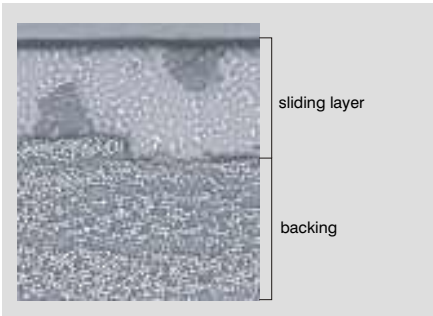
#### Filament wound material

##### 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



Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	140
	- dynamic		140
Maximum sliding speed v	- dry	m/s	0.13
Maximum $\bar{p}v$ factor	- dry	MPa x m/s	1.23
Maximum 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	HB	>350
	- for service life >2000 hours		>480

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

#### 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.

## HPM™

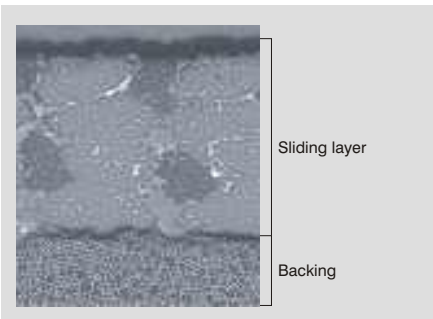
#### Filament wound material

##### 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



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

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

#### 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.

## HPF™

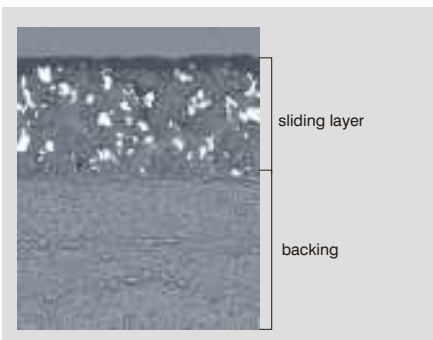
#### Filament wound material

##### Sliding layer

Proprietary filled PTFE tape liner

##### Backing

Continuous woven fiberglass cloth laminate impregnated and cured with epoxy resin



# Product Range

## Multifil™



Tape

### Features

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

### Availability

#### Ex stock:

Tape with 0.38 to 3.2 mm thickness and 305 mm width

### Usage

dry	<b>very good</b>
oil lubricated	<b>very good</b>
grease lubricated	<b>very good</b>
water lubricated	<b>good</b>
process fluid lubricated	<b>good</b>

## Bearing Blocks



### Features

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

### Availability

#### To order:

Customer design size and special shapes

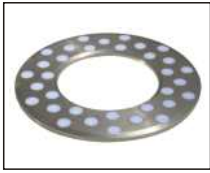
## DB™



Cylindrical bushes



Flanged bushes



Thrust washers



Self-aligning bearings



Slide plates

### 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
- Also available with graphite inserts for temperatures >250°C

### Availability

#### To order:

Cylindrical bushes, flanged bushes, thrust washers, self-aligning bearings, sliding plates and special parts

### Usage

dry	<b>good</b>
oil lubricated	<b>good</b>
grease lubricated	<b>good</b>
water lubricated	<b>good</b>
process fluid lubricated	<b>fair</b>



Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	70
	- dynamic		35
Maximum sliding speed v	- dry	m/s	2.5
Maximum $\bar{p}v$ factor	- dry	MPa x m/s	0.32
	- lubricated		1.25
Maximum temperature $T_{max}$		°C	+280
Minimum temperature $T_{min}$		°C	-200
Coefficient of friction f	- dry	-	0.07
	- lubricated		0.05
Shaft surface finish Ra		µm	0.2 - 0.4
Shaft hardness	- normal	HB	>200

#### Possible Applications

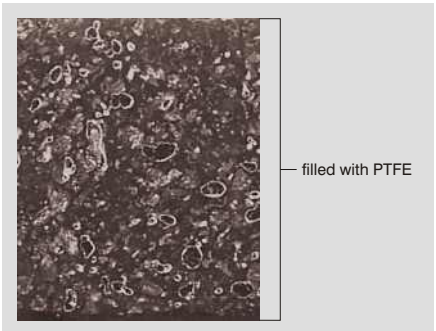
##### Industrial:

Machine tool ways, gibs and other sliding applications

## Multifil™

#### Filament wound material

PTFE + Proprietary filler system



#### Material Composition

	Sical 3	Sical 3D
<b>Sn</b>	3 - 4 %	3 - 3.5 %
<b>Cu</b>	3 - 4 %	4.2 - 4.6 %
<b>Si</b>	<0.6 %	<0.6 %
<b>Fe</b>	<0.7 %	<0.7 %
<b>Other</b>	<1.6 %	<1.6 %
<b>Al</b>	balance	balance

#### Mounted Bearings

Material	Sliding Surface
<b>DU</b>	PTFE + Pb
<b>DP31</b>	PTFE + fillers

## Bearing Blocks

#### Housing material:

Aluminium alloy

#### Assembled bearings:

see table on the left

#### Mechanical Properties

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

#### Possible Applications

##### Industrial and Automotive:

External gear pumps and motors

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	200
	- dynamic		100
Maximum sliding speed v	- dry	m/s	0.5
Maximum $\bar{p}v$ factor, dry		MPa 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

#### Possible Applications

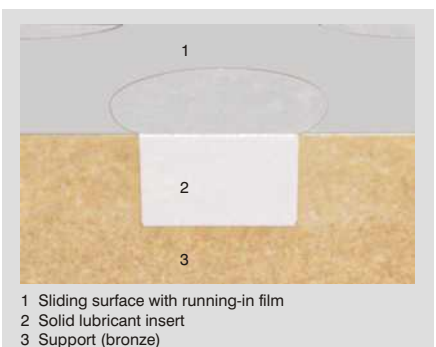
##### Industrial:

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.

## DB™

#### Monometal material

Cast bronze + solid lubricant inserts



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

# Product Range

## Sintered Bronze



Buchsen



Flanged bushes

### 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

### Availability

#### Ex Stock:

Cylindrical and flanged bushes in a variety of dimensions

#### To order:

Non-standard parts

### Usage

dry	<b>good</b> (oil impregnated)
oil lubricated	<b>good</b> (additional oil impregnation)
grease lubricated	<b>fair</b>
water lubricated	<b>not suitable</b>
process fluid lubricated	<b>not suitable</b>

## Machined Bronze Bearings according to ISO 4379



Cylindrical bushes

### Features

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

### Availability

#### To order:

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

### Usage

dry	<b>not suitable</b>
oil lubricated	<b>good</b>
grease lubricated	<b>good</b>
water lubricated	<b>not suitable</b>
process fluid lubricated	<b>not suitable</b>

## SY™



Cylindrical bushes



Thrust washers



Strips

### 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
- Fine turned shaft suitable

### Availability

#### To order:

Cylindrical bushes, thrust washers, strip and special parts; special alloys available

### Usage

dry	<b>poor</b>
oil lubricated	<b>good</b>
grease lubricated	<b>very good</b>
water lubricated	<b>poor</b>
process fluid lubricated	<b>poor</b>

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	10
	- dynamic		5
Maximum sliding speed $v$	- oil impregnated	m/s	10.0
Maximum $\bar{p}v$ factor	- oil impregnated	MPa x m/s	10.0
Maximum temperature $T_{max}$		°C	+90
Minimum temperature $T_{min}$		°C	-5
Coefficient of friction $f$	- oil impregnated	-	0.08 - 0.12
Shaft surface finish $R_a$		$\mu\text{m}$	$\leq 0.2$
Shaft hardness		HB	$>350$

#### Possible Applications

##### Industrial:

FHP motor bearings, domestic appliances and hand tools

## Sintered Bronze

#### Monometal material

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



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

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	200
	- dynamic	MPa	100
Maximum sliding speed $v$	- greased	m/s	2.5
Maximum $\bar{p}v$ factor	- greased	MPa 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 $R_a$		$\mu\text{m}$	0.2 - 0.8
Shaft hardness		HB	$>350$

#### Possible Applications

##### Industrial:

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

## Machined Bronze Bearings according to ISO 4379

#### Monometal material

Bearings made of copper alloys



CuSn12

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	300
	- dynamic	MPa	140
Maximum sliding speed $v$	- greased	m/s	2.5
Maximum $\bar{p}v$ factor	- greased	MPa 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 $R_a$		$\mu\text{m}$	$\leq 0.8$
Shaft hardness	- normal	HB	$>200$
	- for service life $>2000$ hours	HB	$>350$

#### Possible Applications

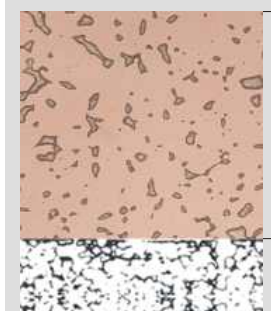
##### Industrial:

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

## SY™

#### Bimetal material

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



CuPb10Sn10  
stannous, lead,  
bronze alloy  
composition  
consistent of:  
appr. 80% Cu  
10% Pb  
10% Sn

steel backing

# Product Range

## SP™



Cylindrical bushes

### 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

### Availability

#### To order:

Cylindrical bushes and special parts

### Usage

dry	<b>poor</b>
oil lubricated	<b>good</b>
grease lubricated	<b>good</b>
water lubricated	<b>poor</b>
process fluid lubricated	<b>poor</b>

## EXALIGN™ Self-aligning Bearing Housings



PB pedestal bearing housing



FL flange bearing housing



DF flange bearing housing

### 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  $\pm 5^\circ$
- 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

### Availability

Order-related production

## UNI™ Self-aligning Bearing Housings



### 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  $\pm 5^\circ$
- 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

### Availability

Order-related production

Bearing properties		Units	Value
Maximum load $\bar{p}$	- static	MPa	250
	- dynamic	MPa	120
Maximum sliding speed v	- greased	m/s	2.5
Maximum $\bar{p}v$ factor	- greased	MPa 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	HB	>200
	- for service life >2000 hours	HB	>350

### Possible Applications

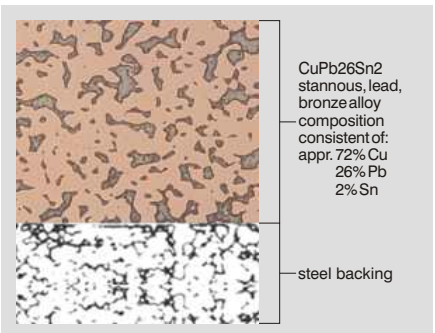
#### Industrial:

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

SP™

#### Bimetal material

Steel-lead-bronze-compound material  
St + CuPb26Sn2



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

### 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

## EXALIGN™ Self-aligning Bearing Housings

**Housing material: Cast iron**

**Spherical material: Cast iron**

Corrosion-free and corrosion resistant models possible

### 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.

### 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

## UNI™ Self-aligning Bearing Housings

**Housing material: GGG40**

**Spherical material: 16MnCr5**

Corrosion resistant material possible



# Product Range

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## MINI™ Self-aligning Bearing Housings



### 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  $\pm 5^\circ$
- 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

### Availability

Order-related production

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### 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.

#### 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

## MINI™ Self-aligning Bearing Housings

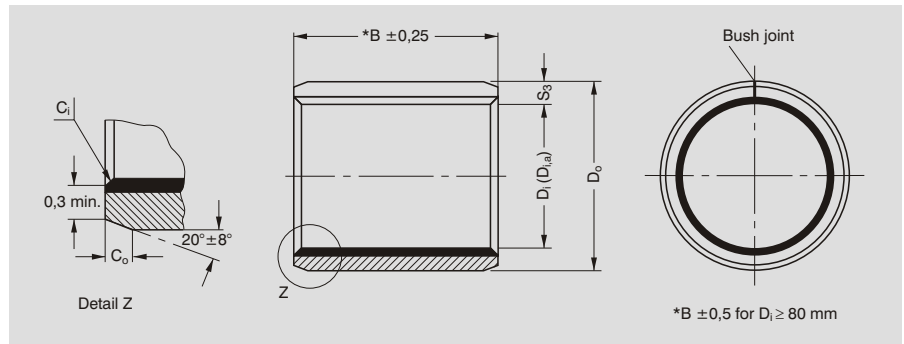
**Housing material:** AIMgSi12

**Ball material:** 9SMn28K

Stainless and other materials possible

Materials		Page
<b>DP4™</b>	Metal-polymer composite material	<b>37</b>
<b>DP4-B™</b>	Metal-polymer composite material	<b>40</b>
<b>DU®</b>	Metal-polymer composite material	<b>42</b>
<b>DU-B™</b>	Metal-polymer composite material	<b>47</b>
<b>DX®</b>	Metal-polymer composite material	<b>49</b>
<b>EP™</b>	Tribologically optimised composite material	<b>52</b>
<b>EP22™</b>	Tribologically optimised composite material	<b>54</b>
<b>EP43™</b>	Tribologically optimised composite material	<b>56</b>
<b>EP63™</b>	Tribologically optimised composite material	<b>58</b>
<b>Glacetal KA™</b>	Polyacetal copolymer (POM)	<b>60</b>
<b>GAR-MAX®</b>	Filament wound composite material	<b>61</b>
<b>Sinterbronze</b>	Monometal material	<b>62</b>
<b>EXALIGN™</b>	self-aligning bearing housing	<b>67</b>
<b>UNI™</b>	self-aligning bearing housing	<b>70</b>
<b>MINI™</b>	self-aligning bearing housing	<b>71</b>

## DP4™ Bushes, cylindrical - material properties see page 8



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

Part No.	Technical Data							
	Dimensions				Installation tolerance			
	Inside Ø Di	Outside Ø Do	Width B	Weight g	Housing Journal	Di,a		
<b>0203DP4</b>	2	3,5	3	0,1	H6 h6	+0,044 +0,004		
<b>0303DP4</b>	3	4,5	3	0,2				
<b>0305DP4</b>	3	4,5	5	0,3				
<b>0306DP4</b>	3	4,5	6	0,4				
<b>0404DP4</b>	4	5,5	4	0,3				
<b>0406DP4</b>	4	5,5	6	0,5				
<b>0410DP4</b>	4	5,5	10	0,8	+0,048 -0,002			
<b>0505DP4</b>	5	7	5	0,7				
<b>0510DP4</b>	5	7	10	1,3				
<b>0606DP4</b>	6	8	6	0,9				
<b>0608DP4</b>	6	8	8	1,2				
<b>0610DP4</b>	6	8	10	1,6				
<b>0710DP4</b>	7	9	10	1,8			H7 f7	
<b>0806DP4</b>	8	10	6	1,0				
<b>0808DP4</b>	8	10	8	1,6				
<b>0810DP4</b>	8	10	10	2,0				
<b>0812DP4</b>	8	10	12	2,4				
<b>1008DP4</b>	10	12	8	2,0	+0,049 -0,001			
<b>1010DP4</b>	10	12	10	2,5				
<b>1015DP4</b>	10	12	15	3,7				
<b>1020DP4</b>	10	12	20	5,2				
<b>1208DP4</b>	12	14	8	2,3				
<b>1210DP4</b>	12	14	10	2,8				
<b>1212DP4</b>	12	14	12	3,3				
<b>1215DP4</b>	12	14	15	4,3				
<b>1220DP4</b>	12	14	20	6,0				
<b>1225DP4</b>	12	14	25	7,6				
<b>1410DP4</b>	14	16	10	3,4	H7 f7			
<b>1415DP4</b>	14	16	15	5,3				
<b>1420DP4</b>	14	16	20	6,9				
<b>1425DP4</b>	14	16	25	8,8				
<b>1510DP4</b>	15	17	10	3,6				
<b>1515DP4</b>	15	17	15	5,4				
<b>1525DP4</b>	15	17	25	9,4	+0,051 +0,001			
<b>1610DP4</b>	16	18	10	3,9				
<b>1612DP4</b>	16	18	12	4,6				
<b>1615DP4</b>	16	18	15	5,9				
<b>1620DP4</b>	16	18	20	8,0				
<b>1625DP4</b>	16	18	25	9,9				
<b>1815DP4</b>	18	20	15	6,7	H7 h8	+0,138 +0,038		
<b>1820DP4</b>	18	20	20	8,5				
<b>1825DP4</b>	18	20	25	11,0				

Other dimensions available on request.

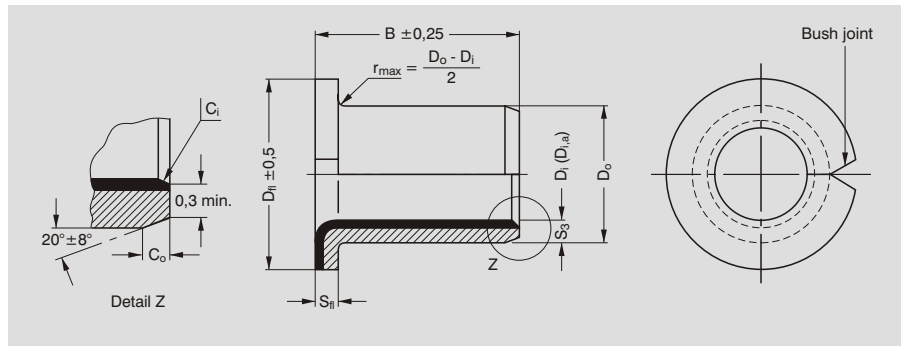
Di,a = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for Di ≤ 4 mm.

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

# DP4™ Bearing Material

Self-lubricating

## DP4™ Flanged Bushes - material properties see page 8



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

Part No.	Technical Data					Installation tolerance					
	Dimensions					Housing	D <sub>i,a</sub>	Flange			
<b>GGB</b>	Inside Ø D <sub>I</sub>	Outside Ø D <sub>O</sub>	Flange Ø D <sub>H</sub>	Width B	Weight g	Journal		thickn. S <sub>H</sub>			
BB0304DP4	3	4,5	7	4,0	0,3	H6	+0,044 +0,004	0,75 <sup>+0,05</sup> -0,05			
BB0404DP4	4	5,5	9	4,0	0,5	h6					
BB0505DP4	5	7	10	5,0	0,7	H7	+0,048 -0,002	1,0 <sup>+0,05</sup> -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						
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	f7	+0,049 -0,001	1,0 <sup>+0,05</sup> -0,2			
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						
BB2012DP4	20	23	30	11,5	10,7					+0,051 +0,001	
BB2017DP4	20	23	30	16,5	15,2		+0,061 +0,001	1,5 <sup>+0,1</sup> -0,2			
BB2512DP4	25	28	35	11,5	13,0	H7	+0,073 +0,003	2,0 <sup>+0,1</sup> -0,2			
BB2522DP4	25	28	35	21,5	23,0						
BB3016DP4	30	34	42	16,0	29,5						
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 <sup>+0,1</sup> -0,2

Other dimensions on request.

D<sub>i,a</sub> = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for D<sub>I</sub> ≤ 4 mm.

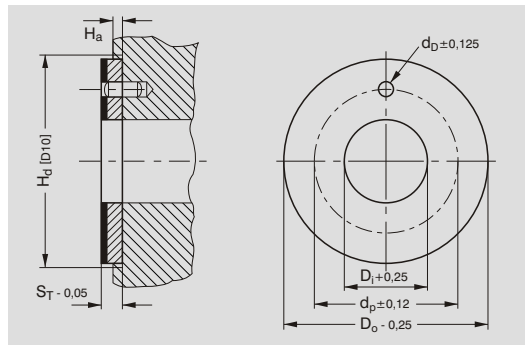
Extension of diameter range to more than 45 mm, see DU flanged thrust washers.



# DP4™ Bearing Material

Self-lubricating

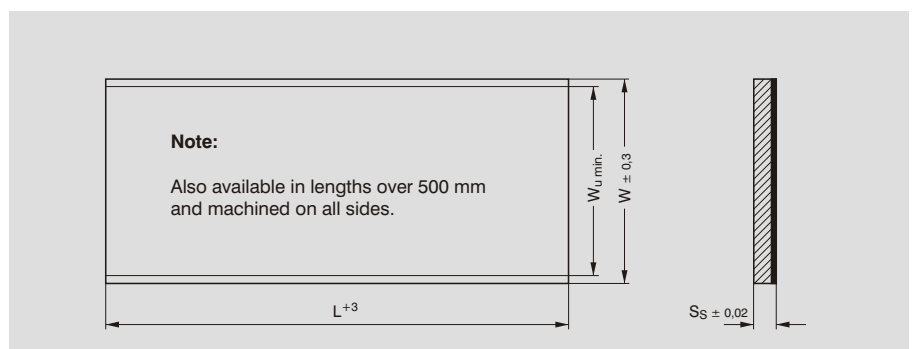
## DP4™ Thrust Washers - material properties see page 8



Part No.	Technical Data						
	Dimensions						Weight g
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Thick-ness S <sub>T</sub>	Dowel hole Ø d <sub>D</sub>	Hole circle Ø d <sub>p</sub>	Recess depth H <sub>a</sub>	
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		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 - material properties see page 8



Punched and moulded parts on request.

Part No.	Technical Data				
	Dimensions				Weight g
GGB	Length L	Total width W	Usable width W <sub>u min.</sub>	Thickness S <sub>s</sub>	
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).

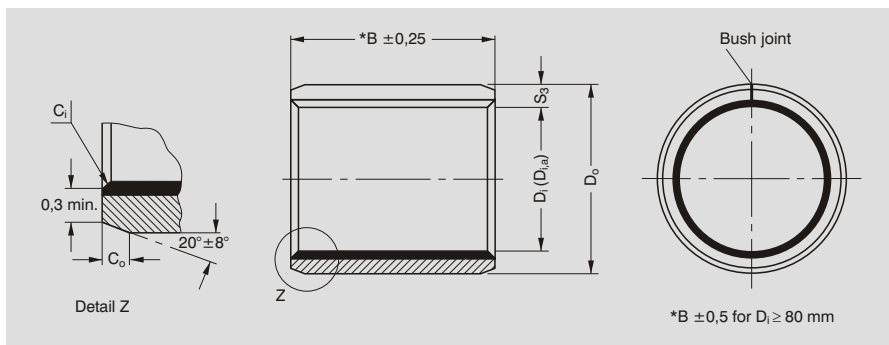
Material thickness 3.05 mm available on request.

# DP4-B™ Bearing Material

Self-lubricating, with bronze backing

## DP4-B™ Bushes, cylindrical - material properties see page 8

with bronze backing



\*B ± 0,5 for Di ≥ 80 mm  
Dimensions [mm], tests and material in accordance with ISO 3547 and GGB specification

Part No.	Technical Data					Installation tolerance	
	Dimensions			Weight g	Housing Journal	Di,a	
GGB	Inside Ø Di	Outside Ø Do	Width B				
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			
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			
1825DP4B	18	20	25	12,0			
2015DP4B	20	23	15	12,3			
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			
3020DP4B	30	34	20	33,0			
3030DP4B	30	34	30	50,0			
3040DP4B	30	34	40	67,0			
3240DP4B	32	36	40	72,0			
					H7 f7	+0,049 -0,001	
						+0,031 +0,001	
						+0,061 +0,001	
						+0,073 +0,003	

Part No.	Technical Data					Installation tolerance	
	Dimensions			Weight g	Housing Journal	Di,a	
GGB	Inside Ø Di	Outside Ø Do	Width B				
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			
4550DP4B	45	50	50	155,0			
5040DP4B	50	55	40	140,0			
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			
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			
					H7 f7	+0,093 +0,003	
					H7 f7	+0,095 +0,005	
					H7 h8	+0,138 +0,038	

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

Inside Ø Di [nominal dimension]	Wall thickness S3 [nominal dimension]	Outside chamfer Co	Inside chamfer Ci
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

Other dimensions available on request.

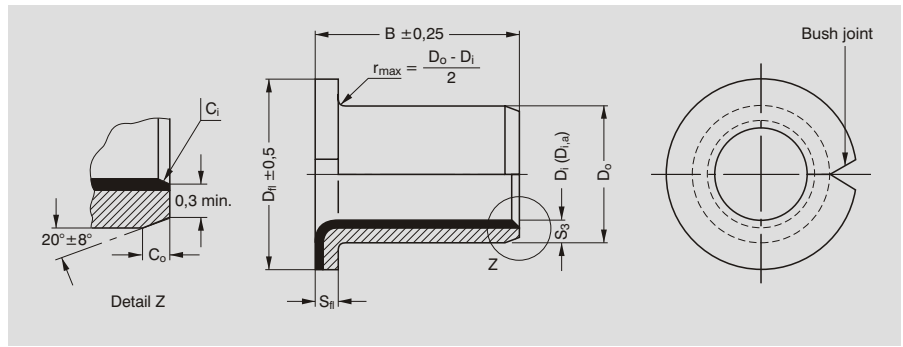
Di,a = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for Di ≤ 4 mm.

# DP4-B™ Bearing Material

Self-lubricating, with bronze backing

## DP4-B™ Flanged Bushes - material properties see page 8

with bronze backing



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

Part No.	Technical Data						
	Dimensions					Installation tolerance	
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Flange Ø D <sub>f</sub>	Width B	Weight g	Housing Journal	D <sub>i,a</sub>
BB0304DP4B	3	4,5	7	4,0	0,3	H6	+0,004
BB0404DP4B	4	5,5	9	4,0	0,5	h6	+0,004
BB0505DP4B	5	7	10	5,0	0,7	H7 f7	+0,048
BB0608DP4B	6	8	12	8,0	1,7		-0,002
BB0806DP4B	8	10	15	5,5	1,8		1,0 +0,05
BB0810DP4B	8	10	15	9,5	2,8		
BB1007DP4B	10	12	18	7,0	2,7		1,0 +0,05
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						
	Dimensions					Installation tolerance	
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Flange Ø D <sub>f</sub>	Width B	Weight g	Housing Journal	D <sub>i,a</sub>
BB1612DP4B	16	18	24	12,0	6,5	H7 f7	+0,049
BB1617DP4B	16	18	24	17,0	8,5		+0,001
BB1812DP4B	18	20	26	12,0	7,0		+0,051
BB1822DP4B	18	20	26	22,0	11,9		
BB2012DP4B	20	23	30	11,5	12,2		+0,061
BB2017DP4B	20	23	30	16,5	16,5		
BB2512DP4B	25	28	35	11,5	15,0		+0,073
BB2522DP4B	25	28	35	21,5	25,0		
BB3016DP4B	30	34	42	16,0	34,0		+0,073
BB3026DP4B	30	34	42	26,0	50,0		
BB3526DP4B	35	39	47	26,0	58,0	+0,093	
BB4026DP4B	40	44	53	26,0	66,0		+0,003
BB4526DP4B	45	50	58	26,0	95,0	+0,093	2,5 +0,1

Other dimensions available on request.

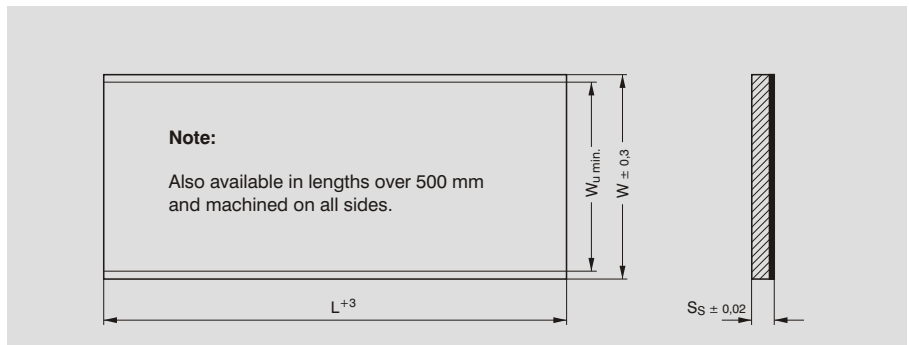
D<sub>i,a</sub> = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for D<sub>i</sub> ≤ 4 mm.

Extension of diameter range to more than 45 mm, see DU flanged thrust washers.

Cracks in the flange diameter are permissible with D<sub>i</sub> ≤ 4 mm.

## DP4-B™ Plates - material properties see page 8

with bronze backing



Punched and moulded parts on request.

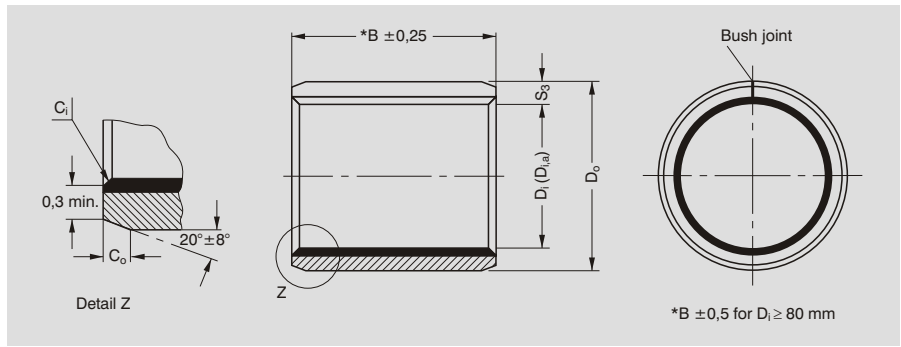
Part No.	Technical Data				
	Dimensions				Weight g
GGB	Length L	Total width W	Usable width W <sub>u min.</sub>	Thickness S <sub>s</sub>	
S07085DP4B	500	95	85	0,72	290,0
S10180DP4B	500	193	180	0,99	770,0
S15180DP4B	500	193	180	1,50	1200,0
S20180DP4B	500	193	180	1,96	1620,0
S25180DP4B	500	193	180	2,44	2060,0

Other dimensions available on request.

# DU® Bearing Material

Self-lubricating, with steel backing

## DU® Bushes, cylindrical - material properties see page 8



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

Part No.	Technical Data					
	Dimensions				Installation tolerance	
	Inside Ø Di	Outside Ø Do	Width B	Weight g	Housing Journal	Di,a
<b>GGB</b>						
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	H7 f7	+0,048 - 0,002
0406DU	4	5,5	6	0,5		
0410DU	4	5,5	10	0,8		
0505DU	5	7	5	0,7		
0508DU	5	7	8	1,1		
0510DU	5	7	10	1,4		
0604DU	6	8	4	0,6	H7 f7	+0,049 - 0,001
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	H7 f7	+0,049 - 0,001
0808DU	8	10	8	1,7		
0810DU	8	10	10	2,1		
0812DU	8	10	12	2,5		
1006DU	10	12	6	1,5		
1008DU	10	12	8	2,1		
1010DU	10	12	10	2,6	H7 f7	+0,049 - 0,001
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	H7 f7	+0,049 - 0,001
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	H7 f7	+0,049 - 0,001
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.

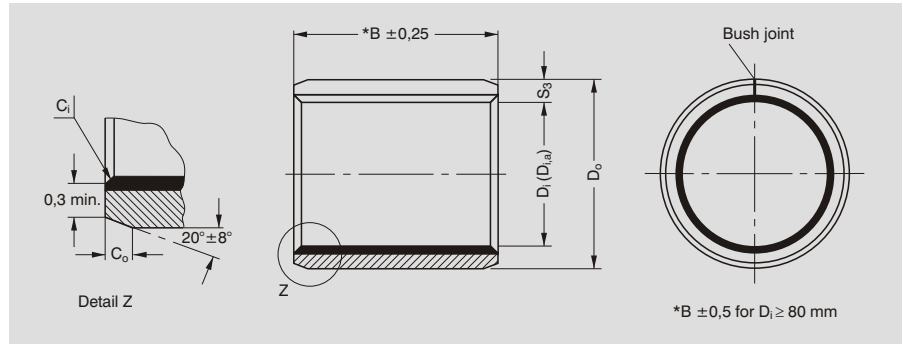
Di,a = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for Di ≤ 4 mm.

Part No.	Technical Data					
	Dimensions				Installation tolerance	
	Inside Ø Di	Outside Ø Do	Width B	Weight g	Housing Journal	Di,a
<b>GGB</b>						
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	H7 f7	+0,051 +0,001
1810DU	18	20	10	4,5		
1815DU	18	20	15	6,8		
1820DU	18	20	20	8,7		
1825DU	18	20	25	11,3		
2010DU	20	23	10	7,5	H7 f7	+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	H7 f7	+0,073 +0,003
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		
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	H7 f7	+0,073 +0,003
3230DU	32	36	30	49,0		
3240DU	32	36	40	65,3		

# DU® Bearing Material

Self-lubricating, with steel backing

## DU® Bushes, cylindrical - material properties see page 8



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

Part No.	Technical Data					Installation tolerance		
	Dimensions			Weight g	Housing Journal	D <sub>i,a</sub>		
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Width B					
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	H7 h8	+0,138 +0,038		
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	+0,193 +0,093			
7580DU	75	80	80	360,0				
8040DU	80	85	40	198,0				
8060DU	80	85	60	297,0				
8080DU	80	85	80	394,0				
80100DU	80	85	100	492,5				
							H7 h8	+0,196 +0,096

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

D<sub>i,a</sub> = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for D<sub>i</sub> ≤ 4 mm.

Part No.	Technical Data					Installation tolerance	
	Dimensions			Weight g	Housing Journal	D <sub>i,a</sub>	
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Width B				
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	+0,190 +0,090		
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			
12060DU	120	125	60	435			
120100DU	120	125	100	730			
125100DU	125	130	100	755			
13060DU	130	135	60	470	+0,193 +0,093		
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	+0,196 +0,096		
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			

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

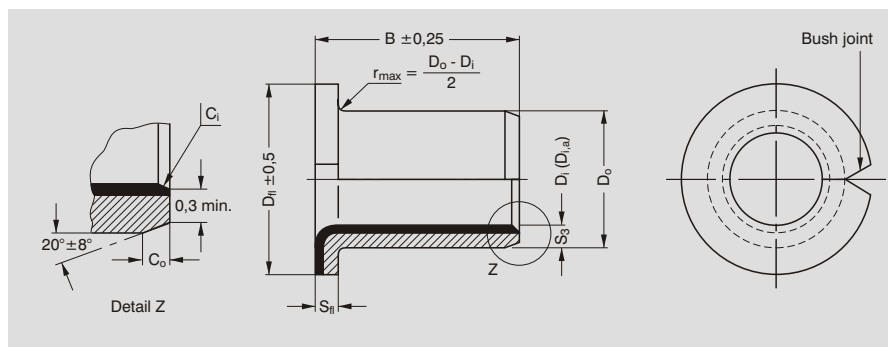
Inside Ø D <sub>i</sub> [nominal dimension]	Wall thickness S <sub>3</sub> [nominal dimension]	Outside chamfer C <sub>o</sub>	Inside chamfer C <sub>i</sub>
2 - 4	0,75	0,5 ± 0,3	-0,1 to -0,4
5 - 18	1,0	0,6 ± 0,4	-0,1 to -0,5
20 - 25	1,5	0,6 ± 0,4	-0,1 to -0,7
28 - 40	2,0	1,1 ± 0,5	-0,1 to -0,7
45 - 300	2,5	1,6 ± 0,8	-0,2 to -1,0



# DU® Bearing Material

Self-lubricating, with steel backing

## DU® Flanged Bushes - material properties see page 8



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					Installation tolerance		
	Dimensions					Housing Journal	D <sub>i,a</sub>	Flange thickn. S <sub>fl</sub>
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Flange Ø D <sub>fl</sub>	Width B	Weight g			
BB0304DU	3	4,5	7	4,0	0,3	H6	+0,044 +0,004	+0,05 -0,05
BB0404DU	4	5,5	9	4,0	0,5	h6		0,75
BB0505DU	5	7	10	5,0	0,7			
BB0604DU	6	8	12	4,0	1,0			
BB0608DU	6	8	12	8,0	1,7			
BB0806DU	8	10	15	5,5	1,7		+0,048 -0,002	
BB0808DU	8	10	15	7,5	2,1			
BB0810DU	8	10	15	9,5	2,5			
BB1007DU	10	12	18	7,0	2,6			
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		+0,049 -0,001	1,0 +0,05 -0,2
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	H7		
BB1617DU	16	18	24	17,0	8,5	f7		
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			
BB3026DU	30	34	42	26,0	46,0			
BB3516DU	35	39	47	16,0	35,0		+0,073 +0,003	2,0 +0,1 -0,2
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.

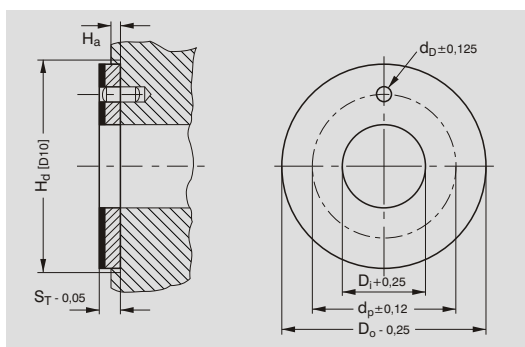
D<sub>i,a</sub> = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for D<sub>i</sub> ≤ 4 mm.

Extension of diameter range D<sub>i</sub> beyond 45 mm, see DU flanged thrust washers combined with cylindrical bushes.

# DU® Bearing Material

Self-lubricating, with steel backing

## DU® Thrust Washers - material properties see page 8



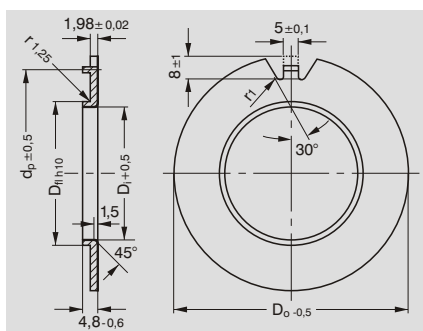
**Delivery status:**  
Steel backing tin-plated

Part No.	Technical Data						
	Dimensions						Weight g
<b>GGB</b>	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Thickness S <sub>T</sub>	Dowel hole Ø d <sub>D</sub>	Hole circle Ø d <sub>p</sub>	Recess depth H <sub>a</sub>	
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		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 DU-B, DP4-B and in special sizes, also with dowel hole.

## DU® Flanged Thrust Washers - material properties see page 8



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

Part No.	Technical Data				
	Dimensions				Weight g
<b>GGB</b>	Inside Ø D <sub>i</sub>	Flange Ø D <sub>fl</sub>	Outside Ø D <sub>o</sub>	Dowel hole Ø d <sub>p</sub>	
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

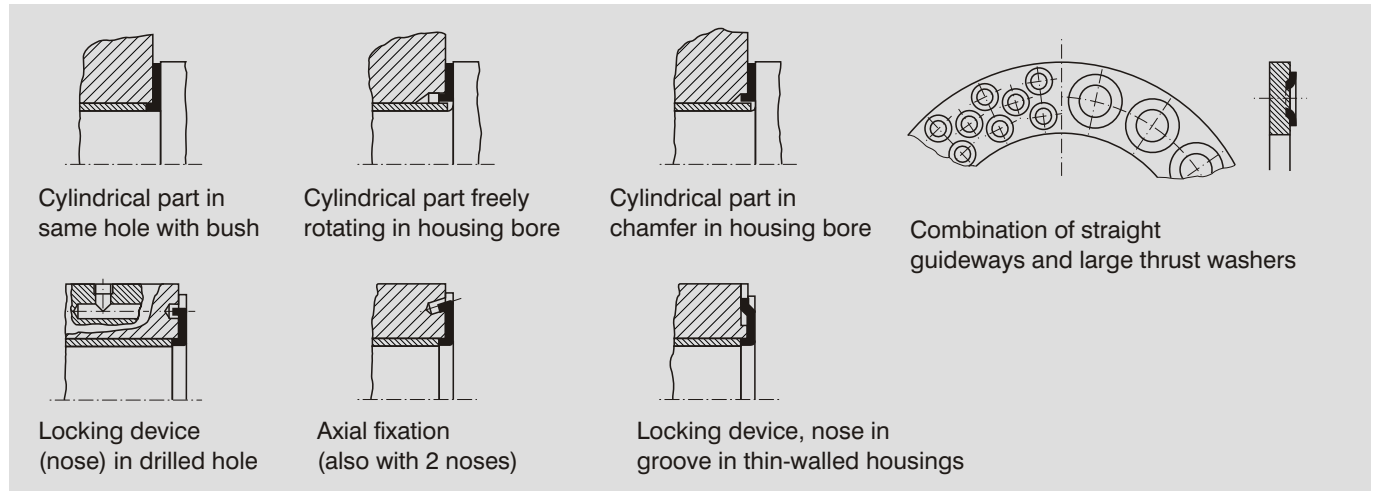
Other dimensions (also in DU-B, DP4 and DP4-B) available on request.

# DU® Bearing Material

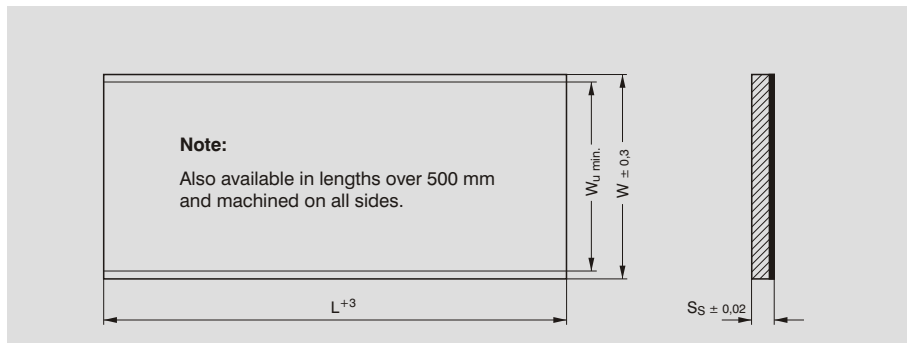
Self-lubricating, with steel backing

## 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.)



## DU® Plates - material properties see page 8



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

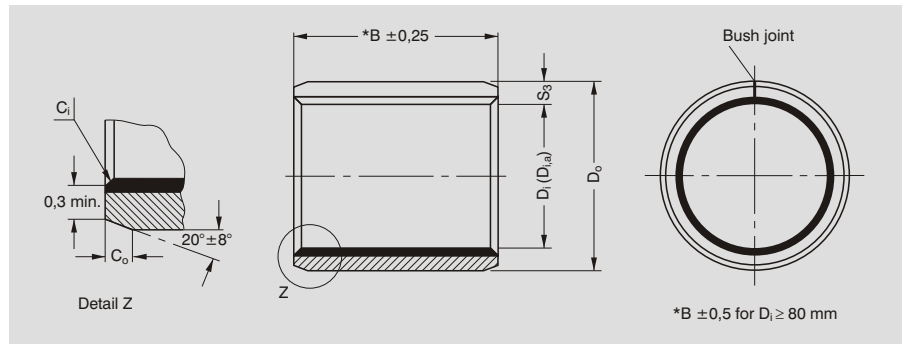
Other dimensions available on request (also in 0.5 mm thickness).  
DU plates are delivered without electroplating (Cu) on the steel backing (except: **S07190DU**).

# DU-B™ Bearing Material

Self-lubricating, with steel backing

DU-B™ Bushes, cylindrical - material properties see page 8

with bronze backing



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

Part No.	Technical Data						
	Dimensions				Installation tolerance		
<b>GGB</b>	Inside Ø Di	Outside Ø Do	Width B	Weight g	Housing Journal	Di,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			
1015DUB	10	12	15	4,1			
1208DUB	12	14	8	2,5			H7 f7
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			
2020DUB	20	23	20	16,5	H7 f7	+0,061 +0,001	
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			
3020DUB	30	34	20	33,0			
3030DUB	30	34	30	50,0			
3040DUB	30	34	40	67,0	+0,073 +0,003		
3240DUB	32	36	40	72,0			

Part No.	Technical Data					
	Dimensions				Installation tolerance	
<b>GGB</b>	Inside Ø Di	Outside Ø Do	Width B	Weight g	Housing Journal	Di,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		
4550DUB	45	50	50	155,0		
5040DUB	50	55	40	140,0		
5060DUB	50	55	60	210,0		
5540DUB	55	60	40	155,0		
6040DUB	60	65	40	168,0		
6050DUB	60	65	50	208,0	H7 f7	+0,095 +0,005
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		
80100DUB	80	85	100	550,0		
85100DUB	85	90	100	523,0		
9060DUB	90	95	60	365,0	H7 h8	+0,138 +0,038
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		

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

Inside Ø Di [nominal dimension]	Wall thickness S3 [nominal dimension]	Outside chamfer C0	Inside chamfer Ci
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

Deformation of the chamfers by circular bending admissible.

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

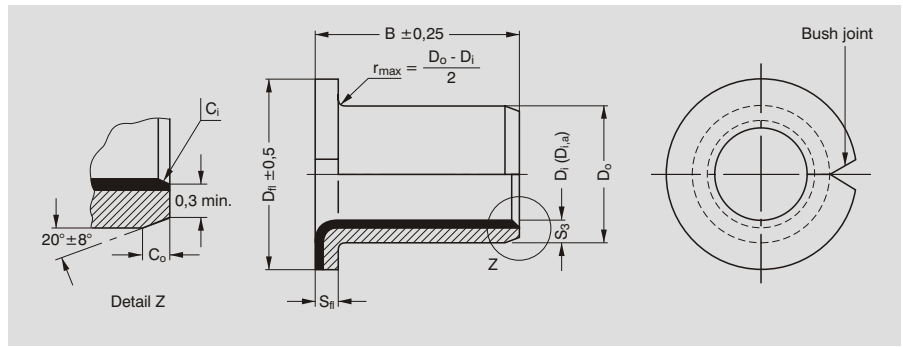
Di,a = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for Di ≤ 4 mm.

# DU-B™ Bearing Material

Self-lubricating, with bronze backing

## DU-B™ Flanged Bushes - material properties see page 10

## with bronze backing



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

Part No.	Technical Data						Installation tolerance		
	Dimensions					Housing Journal	D <sub>i,a</sub>	Flange thckn. S <sub>1</sub>	
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Flange Ø D <sub>f</sub>	Width B	Weight g				
BB0304DUB	3	4,5	7	4,0	0,3	H6	+0,044	+0,05	
BB0404DUB	4	5,5	9	4,0	0,5	h6	+0,004	0,75	
BB0505DUB	5	7	10	5,0	0,7	H7	+0,048	-0,002	
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				
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				f7
BB1512DUB	15	17	23	12,0	6,0	1,0	+0,05	-0,2	
BB1517DUB	15	17	23	17,0	8,0				

Part No.	Technical Data						Installation tolerance		
	Dimensions					Housing Journal	D <sub>i,a</sub>	Flange thckn. S <sub>1</sub>	
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Flange Ø D <sub>f</sub>	Width B	Weight g				
BB1612DUB	16	18	24	12,0	6,5	H7	+0,049	+0,001	
BB1617DUB	16	18	24	17,0	8,5				
BB1812DUB	18	20	26	12,0	7,0				
BB1822DUB	18	20	26	22,0	11,9				
BB2012DUB	20	23	30	11,5	12,2				
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				
BB3026DUB	30	34	42	26,0	50,0				
BB3526DUB	35	39	47	26,0	58,0	f7	+0,061	+0,001	
BB4026DUB	40	44	53	26,0	66,0				
BB4526DUB	45	50	58	26,0	95,0	+0,073	+0,003	1,0	
						+0,093	+0,003	2,0	
								+0,1	
								2,5	

Other dimensions available on request.

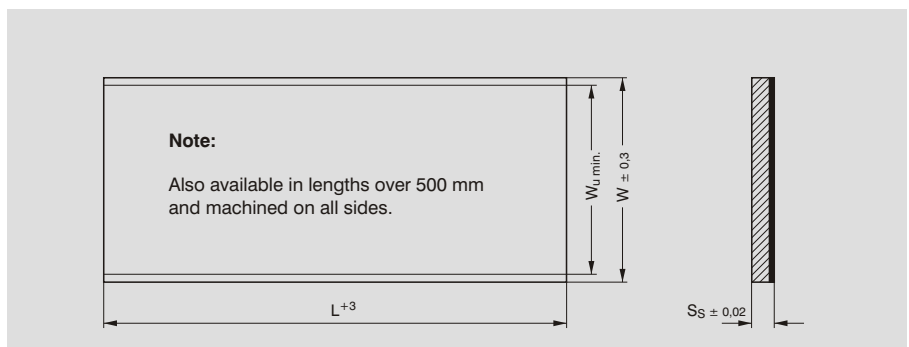
D<sub>i,a</sub> = Tolerances of inside bush diameter after installation in housing centre H7, or H6 for D<sub>i</sub> ≤ 4 mm.

Extension of diameter range to more than 45 mm, see DU flanged thrust washers.

Cracks in the flange diameter are permissible with D<sub>i</sub> ≤ 4 mm.

## DU-B™ Plates - material properties see page 10

## with bronze backing



Punched and moulded parts on request.

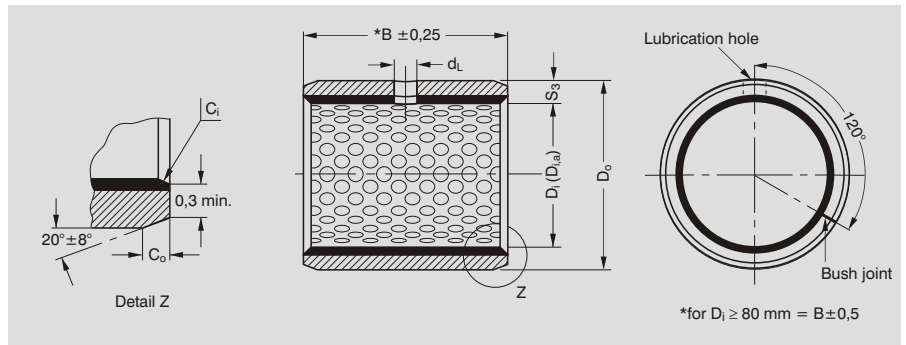
Part No.	Technical Data				
	Dimensions				Weight g
GGB	Length L	Total width W	Usable width W <sub>u,min.</sub>	Thickness S <sub>s</sub>	
S07085DUB	500	95	85	0,72	290,0
S10180DUB	500	193	180	0,99	770,0
S15180DUB	500	193	180	1,50	1200,0
S20180DUB	500	193	180	1,98	1620,0
S25180DUB	500	193	180	2,48	2060,0

Other dimensions available on request.

# DX® Bearing Material

Low-maintenance, with copper-plated steel backing

## PM DX® Bushes, cylindrical (PM=prefinished) - material properties see page 12



\*for  $D_i \geq 80 \text{ mm} = B \pm 0,5$

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

Part No.	Technical Data					Installation tolerance	
	Dimensions					Housing Journal	$D_{i,a}$
GGB	Inside $\varnothing D_i$	Outside $\varnothing D_o$	Width B	Lubrication hole $\varnothing d_L$	Weight g		
PM0808DX	8	10	8	-	1,2	H7 h8	+0,098
PM0810DX	8	10	10	-	1,5		+0,048
PM0812DX	8	10	12	-	1,8		
PM1010DX	10	12	10	3	1,9	H7 h8	+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	H7 h8	+0,183 +0,093
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	H7 h8	+0,185 +0,095
PM1625DX	16	18	25	4	7,1		
PM1815DX	18	20	15	4	4,7		
PM1820DX	18	20	20	4	6,4	H7 h8	+0,101 +0,051
PM1825DX	18	20	25	4	8,0		
PM2010DX	20	23	10	4	5,9		
PM2015DX	20	23	15	4	8,4	H7 h8	+0,121 +0,061
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	H7 h8	+0,143 +0,073
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	H7 h8	+0,247 +0,115
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	H7 h8	+0,143 +0,073
PM2830DX	28	32	30	6	34,1		
PM283130DX	28	31	30	6	23,5		

Part No.	Technical Data					Installation tolerance	
	Dimensions					Housing Journal	$D_{i,a}$
GGB	Inside $\varnothing D_i$	Outside $\varnothing D_o$	Width B	Lubrication hole $\varnothing d_L$	Weight g		
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	H7 h8	+0,183 +0,093
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	H7 h8	+0,185 +0,095
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	H7 h8	+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	H7 h8	+0,247 +0,115
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	H7 h8	+0,247 +0,115
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	H7 h8	+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	H7 h8	+0,247 +0,115
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  $D_i \leq 40 \text{ mm}$  still tin-plated in some cases.

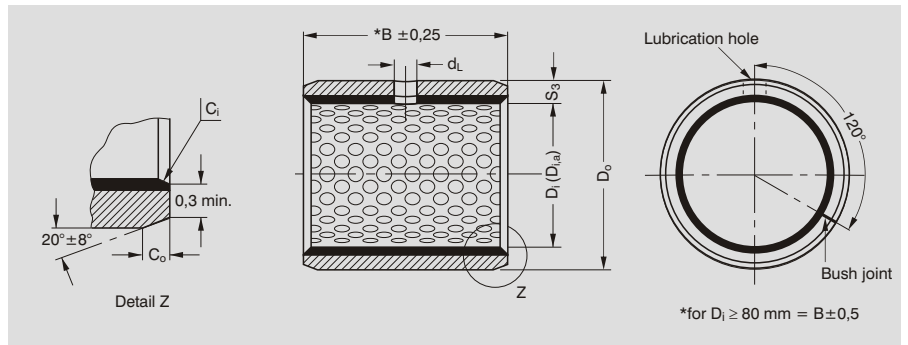
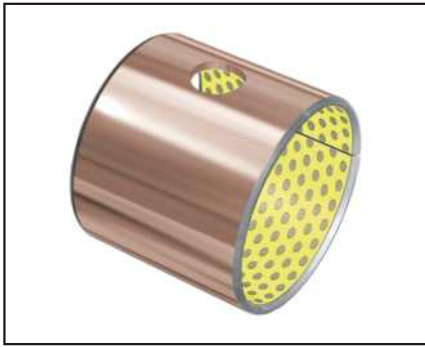
MB DX bushes (machinable) on request.



# DX<sup>®</sup> Bearing Material

Low-maintenance, with copper-plated steel backing

## PM DX<sup>®</sup> Bushes, cylindrical (PM=prefinished) - material properties see page 12



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

Part No.	Technical Data					Installation tolerance	
	Dimensions					Housing Journal	D <sub>i,a</sub>
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Width B	Lubrication hole Ø d <sub>L</sub>	Weight g		
PM7540DX	75	80	40	9,5	153,0	H7	+0,247
PM7560DX	75	80	60	9,5	234,0		+0,115
PM7580DX	75	80	80	9,5	305,0		
PM8040DX	80	85	40	9,5	164,0	h8	+0,250
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					Installation tolerance	
	Dimensions					Housing Journal	D <sub>i,a</sub>
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Width B	Lubrication hole Ø d <sub>L</sub>	Weight g		
PM12060DX	120	125	60	9,5	365	H7	+0,260
PM120100DX	120	125	100	9,5	615		
PM120110DX	120	125	110	9,5	675		
PM12560DX	125	130	60	9,5	385	h8	+0,150
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	H7	+0,263
PM170100DX	170	175	100		865		
PM18050DX	180	185	50		465		
PM18060DX	180	185	60		545	h8	+0,153
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		
PM250100DX	250	255	100		1.275		
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 <sub>i</sub> [nominal dimension]	Wall thickness S <sub>3</sub> [nominal dimension]	Outside chamfer C <sub>o</sub>	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.

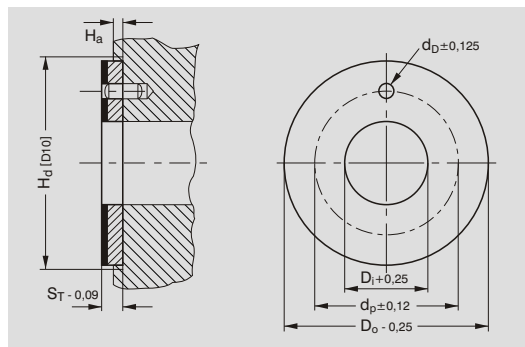
Other dimensions, including inch sizes and intermediate sizes over 300 mm available on request.

D<sub>i,a</sub> = Tolerances of internal bush diameter after installation in housing centre H7. MB DX bushes (machinable) on request.

# DX<sup>®</sup> Bearing Material

Low-maintenance, with copper-plated steel backing

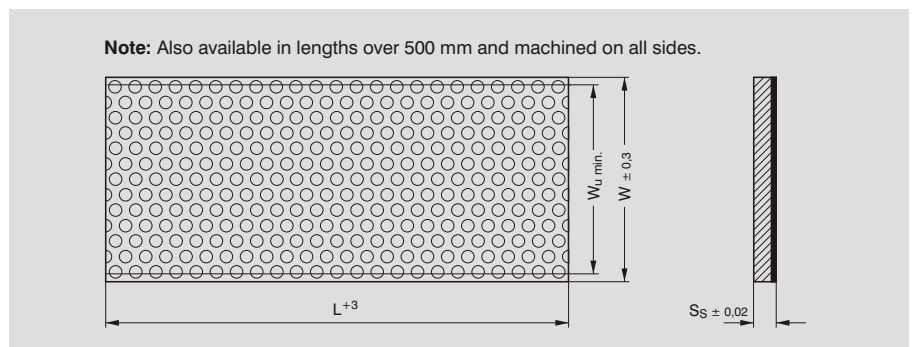
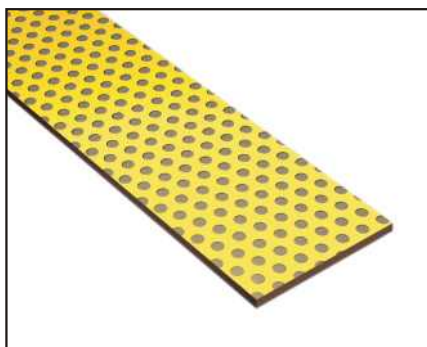
## PM DX<sup>®</sup> Thrust Washers (PM=prefinished) - material properties see page 12



Part No.	Technical Data						
	Dimensions						Weight g
<b>GGB</b>	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Thickness S <sub>T</sub>	Dowel hole Ø d <sub>D</sub>	Hole circle Ø d <sub>p</sub>	Recess depth H <sub>a</sub>	
WC08DX	10	20	1,58	-	-	0,95 to 1,20	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		6,2
WC20DX	22	38	1,58	3,25	30		6,7
WC22DX	24	42	1,58	3,25	33		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	1,45 to 1,70	18,7
WC45DX	48	74	2,60	4,25	61		41,3
WC50DX	52	78	2,60	4,25	65	44,2	

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

## MB DX<sup>®</sup> Plates (MB=machinable) - material properties see page 12



Part No.	Technical Data				
	Dimensions				Weight g
<b>GGB</b>	Length L	Total width W	Useful width W <sub>u min.</sub>	Thickness S <sub>s</sub>	
S11090DX	500	102	90	1,12	290,0
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.

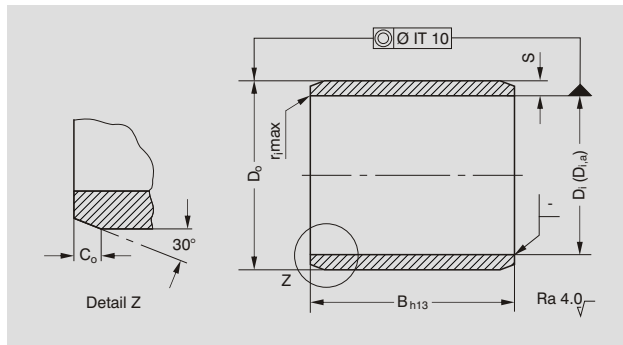
Maximum finishing depth 0,125 mm.

MB DX plates are delivered with electroplating (Cu) on the steel backing.

# EP™ Bearing Material

Maintenance-free thermoplastic bearing material

## EP™ Bushes, cylindrical - material properties see page 14



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

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

Other dimensions available on request.

D<sub>i,a</sub> = Tolerances of internal bush diameter after installation in housing centre H7.

### Outside chamfers and inside radii

S	C <sub>o</sub>	r <sub>fmax</sub>
1,0	0,5	0,1
1,5	0,8	0,2
2	0,8	0,2

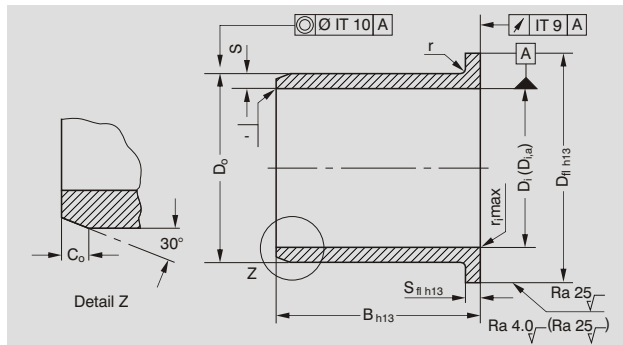
Recommended tolerance class for shafts h7

Do you require samples at short notice with customised designs or a special material? Contact your local GGB sales engineer (pg. 73).

# EP™ Bearing Material

Maintenance-free thermoplastic bearing material

## EP™ Flanged Bushes - material properties see page 14



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

Part No.	Technical Data						Installation tolerance	
	Dimensions						Housing Journal	D <sub>i,a</sub>
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Flange Ø D <sub>n</sub>	Flange S <sub>n</sub>	Width B	Weight g		
BB0505EP	5	7	11	1,0	5,0	0,2	+0,015 0	+0,105 +0,030
BB0604EP	6	8	12	1,0	4,0	0,2		
BB0606EP	6	8	12	1,0	6,0	0,3		
BB0608EP	6	8	12	1,0	8,0	0,4		
BB0610EP	6	8	12	1,0	10,0	0,4		
BB0806EP	8	10	15	1,0	5,5	0,4	+0,018 0	+0,130 +0,040
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	+0,018 0	+0,160 +0,050
BB1009EP	10	12	18	1,0	9,0	0,7		
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	+0,021 0	+0,195 +0,065
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		
BB1217EP	12	14	20	1,0	17,0	1,3		
BB1220EP	12	14	20	1,0	20,0	1,5		
BB1412EP	14	16	22	1,0	12,0	1,1		
BB1417EP	14	16	22	1,0	17,0	1,5		
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		
BB2512EP	25	28	35	1,5	11,5	2,9		
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<sub>i,a</sub> = Tolerances of internal bush diameter after installation in housing centre H7.

### Outside chamfers and inside radii

S	C <sub>o</sub>	r <sub>max</sub>
1,0	0,5	0,1
1,5	0,8	0,2

S	r (mm)
≤ 1	0,3
> 1	0,5

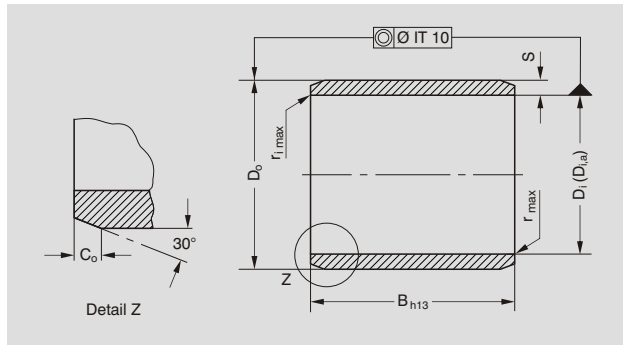
Recommended tolerance class for shafts h7

Do you require samples at short notice with customised designs or a special material? Contact your local GGB sales engineer (pg. 73).

# EP22™ Bearing Material

Maintenance-free thermoplastic bearing material

## EP22™ Bushes, cylindrical - material properties see page 16



### Outside chamfers and inside radii

S	C <sub>o</sub>	r <sub>max</sub>
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					
	Dimensions				Installation tolerance	
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Width B	Weight g	Housing H7	D <sub>i,a</sub>
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	+0,102 +0,032
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		
1212EP22	12	14	12	0,7		
1215EP22	12	14	15	0,9		
1220EP22	12	14	20	1,2		
1415EP22	14	16	15	1,0	+0,021 0	+0,124 +0,040
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		
1625EP22	16	18	25	1,8		
1825EP22	18	20	25	2,0		
2015EP22	20	23	15	2,2		
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.

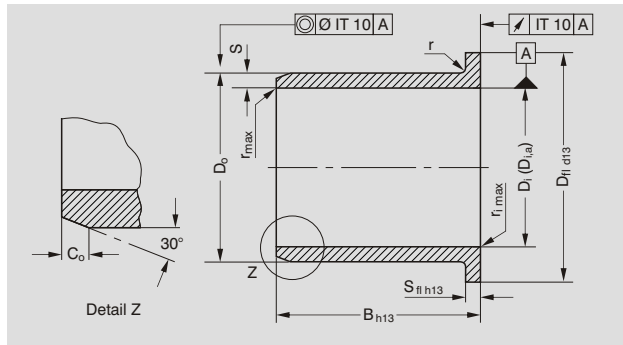
D<sub>i,a</sub> = Tolerances of internal bush diameter after installation in housing centre H7.

Do you require samples at short notice with customised designs or a special material? Contact your local GGB sales engineer (pg. 73).

# EP22™ Bearing Material

Maintenance-free thermoplastic bearing material

## EP22™ Flanged Bushes - material properties see page 16



### Outside chamfers and inside radii

S	C <sub>o</sub>	r <sub>max</sub>
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

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

Part No.	Technical Data						Installation tolerance	
	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Flange Ø D <sub>n</sub>	Flange S <sub>n</sub>	Width B	Weight g	Housing Journal	D <sub>i,a</sub>
<b>BB0806EP22</b>	8	10	15	1,0	5,5	0,4	+0,015 0	
<b>BB0808EP22</b>	8	10	15	1,0	7,5	0,5		
<b>BB0810EP22</b>	8	10	15	1,0	10	0,5		
<b>BB1007EP22</b>	10	12	18	1,0	7	0,6	+0,083 +0,025	
<b>BB1009EP22</b>	10	12	18	1,0	9	0,7		
<b>BB1012EP22</b>	10	12	18	1,0	12	0,8		
<b>BB1015EP22</b>	10	12	18	1,0	15	1,0		
<b>BB1017EP22</b>	10	12	18	1,0	17	1,1		
<b>BB1207EP22</b>	12	14	20	1,0	7	0,6		
<b>BB1209EP22</b>	12	14	20	1,0	9	0,8	+0,018 0	
<b>BB1212EP22</b>	12	14	20	1,0	12	1,2		
<b>BB1215EP22</b>	12	14	20	1,0	15	1,3		
<b>BB1217EP22</b>	12	14	20	1,0	17	1,4		
<b>BB1220EP22</b>	12	14	20	1,0	20	1,5		
<b>BB1412EP22</b>	14	16	22	1,0	12	0,9		
<b>BB1417EP22</b>	14	16	22	1,0	17	1,5		
<b>BB1509EP22</b>	15	17	23	1,0	9	1,0	+0,021 0	+0,124 +0,040
<b>BB1512EP22</b>	15	17	23	1,0	12	1,2		
<b>BB1517EP22</b>	15	17	23	1,0	17	1,5		
<b>BB1520EP22</b>	15	17	23	1,0	20	1,8		
<b>BB1617EP22</b>	16	18	24	1,0	17	1,7		
<b>BB1817EP22</b>	18	20	26	1,0	17	2,1	+0,021 0	+0,124 +0,040
<b>BB2012EP22</b>	20	23	30	1,5	11,5	2,4		
<b>BB2017EP22</b>	20	23	30	1,5	16,5	3,2		
<b>BB2022EP22</b>	20	23	30	1,5	21,5	3,9	+0,021 0	+0,124 +0,040
<b>BB2512EP22</b>	25	28	35	1,5	11,5	2,9		
<b>BB2517EP22</b>	25	28	35	1,5	16,5	3,9		
<b>BB2522EP22</b>	25	28	35	1,5	21,5	4,9	+0,021 0	+0,124 +0,040

Other dimensions available on request.

D<sub>i,a</sub> = Tolerances of internal bush diameter after installation in housing centre H7.

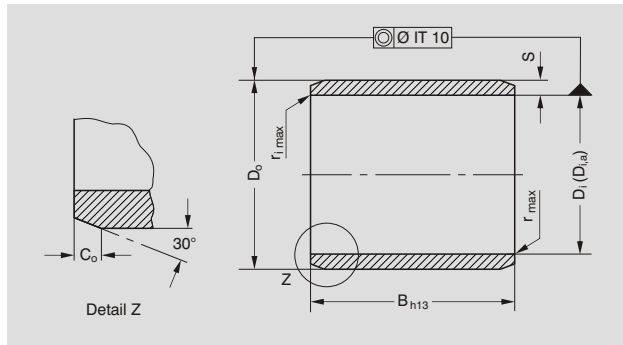
Do you require samples at short notice with customised designs or a special material? Contact your local GGB sales engineer (pg. 73).



# EP43™ Bearing Material

Maintenance-free thermoplastic bearing material

## EP43™ Bushes, cylindrical - material properties see page 16



### Outside chamfers and inside radii

S	C <sub>o</sub>	r <sub>max</sub>
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					
	Dimensions				Installation tolerance	
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Width B	Weight g	Housing H7	D <sub>i,a</sub>
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	+0,086 +0,016
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		
1212EP43	12	14	12	0,7		
1215EP43	12	14	15	0,9		
1220EP43	12	14	20	1,2		
1415EP43	14	16	15	1,0	+0,021 0	+0,104 +0,020
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		
1625EP43	16	18	25	1,8		
1825EP43	18	20	25	2,0		
2015EP43	20	23	15	2,2		
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.

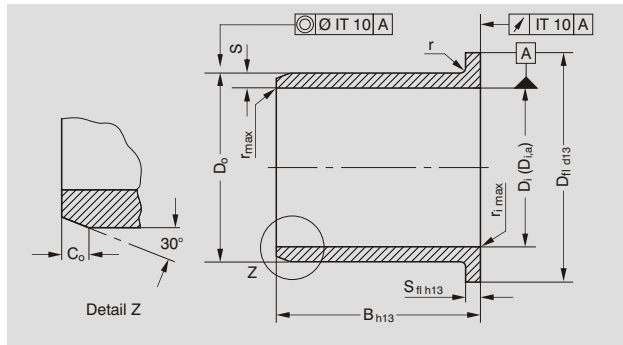
D<sub>i,a</sub> = Tolerances of internal bush diameter after installation in housing centre H7.

Do you require samples at short notice with customised designs or a special material? Contact your local GGB sales engineer (pg. 73).

# EP43™ Bearing Material

Maintenance-free thermoplastic bearing material

## EP43™ Flanged Bushes - material properties see page 16



### Outside chamfers and inside radii

S	C <sub>o</sub>	r <sub>max</sub>
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

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

Part No.	Technical Data							Installation tolerance	
	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Flange Ø D <sub>fl</sub>	Flange S <sub>fl</sub>	Width B	Weight g	Housing Journal	D <sub>i,a</sub>	
<b>BB0806EP43</b>	8	10	15	1,0	5,5	0,4	+0,015 0		
<b>BB0808EP43</b>	8	10	15	1,0	7,5	0,5			
<b>BB0810EP43</b>	8	10	15	1,0	10	0,5			
<b>BB1007EP43</b>	10	12	18	1,0	7	0,6	+0,018 0	+0,071 +0,013	
<b>BB1009EP43</b>	10	12	18	1,0	9	0,7			
<b>BB1012EP43</b>	10	12	18	1,0	12	0,8			
<b>BB1015EP43</b>	10	12	18	1,0	15	1,0			
<b>BB1017EP43</b>	10	12	18	1,0	17	1,1			
<b>BB1207EP43</b>	12	14	20	1,0	7	0,6			
<b>BB1209EP43</b>	12	14	20	1,0	9	0,8	+0,018 0	+0,086 +0,016	
<b>BB1212EP43</b>	12	14	20	1,0	12	1,2			
<b>BB1215EP43</b>	12	14	20	1,0	15	1,3			
<b>BB1217EP43</b>	12	14	20	1,0	17	1,4			
<b>BB1220EP43</b>	12	14	20	1,0	20	1,5			
<b>BB1412EP43</b>	14	16	22	1,0	12	0,9			
<b>BB1417EP43</b>	14	16	22	1,0	17	1,5	+0,021 0	+0,104 +0,020	
<b>BB1509EP43</b>	15	17	23	1,0	9	1,0			
<b>BB1512EP43</b>	15	17	23	1,0	12	1,2			
<b>BB1517EP43</b>	15	17	23	1,0	17	1,5			
<b>BB1520EP43</b>	15	17	23	1,0	20	1,8			
<b>BB1617EP43</b>	16	18	24	1,0	17	1,7			
<b>BB1817EP43</b>	18	20	26	1,0	17	2,1	+0,021 0	+0,104 +0,020	
<b>BB2012EP43</b>	20	23	30	1,5	11,5	2,4			
<b>BB2017EP43</b>	20	23	30	1,5	16,5	3,2			
<b>BB2022EP43</b>	20	23	30	1,5	21,5	3,9	+0,021 0	+0,104 +0,020	
<b>BB2512EP43</b>	25	28	35	1,5	11,5	2,9			
<b>BB2517EP43</b>	25	28	35	1,5	16,5	3,9			
<b>BB2522EP43</b>	25	28	35	1,5	21,5	4,9	+0,021 0	+0,104 +0,020	

Other dimensions available on request.

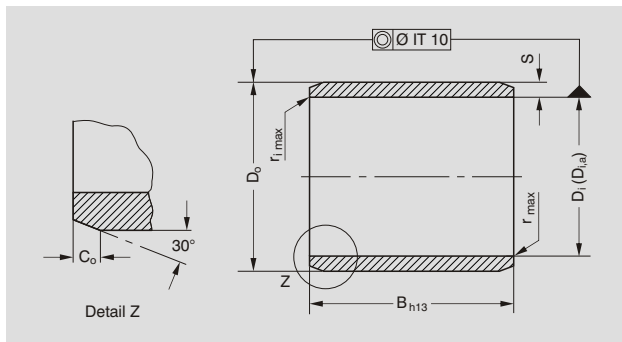
D<sub>i,a</sub> = Tolerances of internal bush diameter after installation in housing centre H7.

Do you require samples at short notice with customised designs or a special material? Contact your local GGB sales engineer (pg. 73).

# EP63™ Bearing Material

Maintenance-free thermoplastic bearing material

## EP63™ Bushes, cylindrical - material properties see page 18



### Outside chamfers and inside radii

S	C <sub>o</sub>	r <sub>max</sub>
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					
	Dimensions				Installation tolerance	
GGB	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Width B	Weight g	Housing H7	D <sub>i,a</sub>
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	+0,086 +0,016
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		
1212EP63	12	14	12	0,7		
1215EP63	12	14	15	0,9		
1220EP63	12	14	20	1,2		
1415EP63	14	16	15	1,0	+0,021 0	+0,104 +0,020
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		
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.

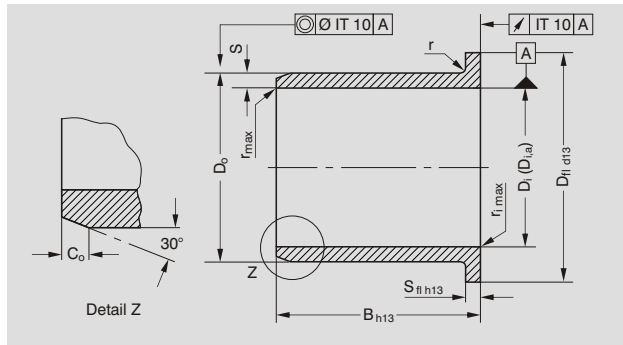
D<sub>i,a</sub> = Tolerances of internal bush diameter after installation in housing centre H7.

Do you require samples at short notice with customised designs or a special material? Contact your local GGB sales engineer (pg. 73).

# EP63™ Bearing Material

Maintenance-free thermoplastic bearing material

## EP63™ Flanged Bushes - material properties see page 18



### Outside chamfers and inside radii

S	C <sub>o</sub>	r <sub>max</sub>
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

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

Part No.	Technical Data						Installation tolerance	
	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Flange Ø D <sub>n</sub>	Flange S <sub>n</sub>	Width B	Weight g	Housing Journal	D <sub>i,a</sub>
<b>GGB</b>								
BB0806EP63	8	10	15	1,0	5,5	0,4	+0,015 0	
BB0808EP63	8	10	15	1,0	7,5	0,5		
BB0810EP63	8	10	15	1,0	10	0,5		
BB1007EP63	10	12	18	1,0	7	0,6	+0,071 +0,013	
BB1009EP63	10	12	18	1,0	9	0,7		
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	+0,018 0	
BB1212EP63	12	14	20	1,0	12	1,2		
BB1215EP63	12	14	20	1,0	15	1,3		
BB1217EP63	12	14	20	1,0	17	1,4		
BB1220EP63	12	14	20	1,0	20	1,5		
BB1412EP63	14	16	22	1,0	12	0,9		
BB1417EP63	14	16	22	1,0	17	1,5		
BB1509EP63	15	17	23	1,0	9	1,0	+0,021 +0,104 0 +0,020	
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		
BB2512EP63	25	28	35	1,5	11,5	2,9		
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.

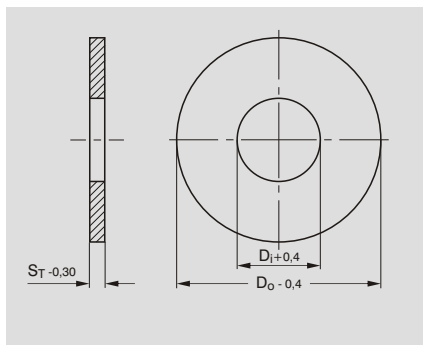
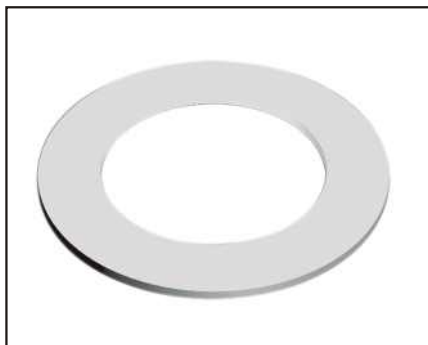
D<sub>i,a</sub> = Tolerances of internal bush diameter after installation in housing centre H7.

Do you require samples at short notice with customised designs or a special material? Contact your local GGB sales engineer (pg. 73).

# Glacetal KA™ Thrust Washers

Low-maintenance, made of polyacetal copolymer (POM)

**Glacetal KA™ Thrust Washers - material properties see page 20**

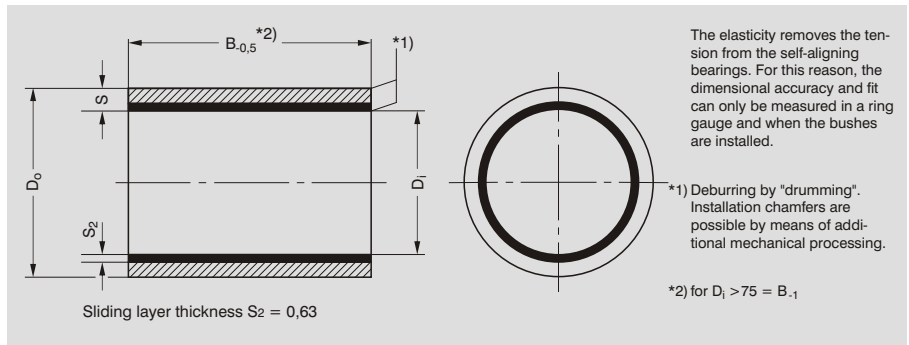


Part No.	Technical Data			
	Dimensions			Weight g
<b>GGB</b>	Inside Ø D <sub>i</sub>	Outside Ø D <sub>o</sub>	Thickness S <sub>T</sub>	
WC10KA	10,5	24,20	1,65	0,8
WC12KA	12,5	26,20	1,65	0,9
WC14KA	14,5	30,20	1,65	1,1
WC16KA	16,5	32,20	1,65	1,3
WC18KA	18,5	36,20	1,65	1,6
WC20KA	20,5	38,20	1,65	1,7
WC22KA	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.

Do you require samples at short notice with customised designs or a special material? Contact your local GGB sales engineer (pg. 73).

## GAR-MAX® Bushes, cylindrical - material properties see page 22



Dimensions [mm]

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

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

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

### Dimensions in assembled state

Inside Ø D <sub>i</sub>	Inside Ø D <sub>i</sub>	Inside Ø D <sub>i</sub>	Inside Ø D <sub>i</sub>
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		

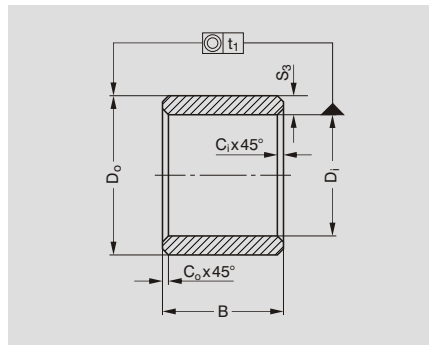
Outside Ø D <sub>o</sub>	Outside Ø D <sub>o</sub>	Outside Ø D <sub>o</sub>	Outside Ø D <sub>o</sub>
> 16 - 25	+0,090 +0,040	> 70 - 85	+0,125 +0,075
> 25 - 40	+0,095 +0,045	> 85 - 100	+0,135 +0,085
> 40 - 50	+0,105 +0,055	> 100 - 110	+0,140 +0,090
> 50 - 70	+0,115 +0,065	> 110 - 120	+0,170 +0,100



# Sinterbronze Bearing Material

Self-lubricating (oil-impregnated)

**Sinterbronze bushes, cylindrical (similar to Sint A 50) - material properties see page 30**



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

Part No.	Technical Data				Installation tolerance Housing Journal
	Dimensions			Weight g	
GGB	Inside Ø $D_i$	Outside Ø $D_o$	Width B		
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				Installation tolerance Housing Journal
	Dimensions			Weight g	
GGB	Inside Ø $D_i$	Outside Ø $D_o$	Width B		
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.

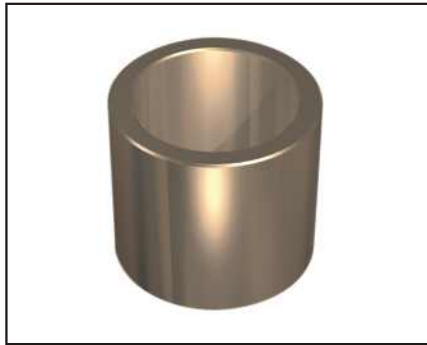
Note: dividing and shortening is not carried out by GGB.

Tolerances applicable for wall thicknesses <4 mm. For wall thicknesses of 4 mm and more please consult GGB.

# Sinterbronze Bearing Material

Self-lubricating (oil-impregnated)

## Sinterbronze bushes, cylindrical (similar to Sint A 50) - material properties see page 30



After the bushes have been pressed into a H7 housing hole using an m6 mandrel, cylindrical bushes have an H7 inside diameter (H8 for  $\varnothing \geq 50$  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				Installation tolerance Housing Journal
	Dimensions			Weight g	
GGB	Inside $\varnothing$ $D_i$	Outside $\varnothing$ $D_o$	Width B		
162016BP25	16	20	16	12,2	H7 f7
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	
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				Installation tolerance Housing Journal
	Dimensions			Weight g	
GGB	Inside $\varnothing$ $D_i$	Outside $\varnothing$ $D_o$	Width B		
253020BP25	25	30	20	28,9	H7 f7
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	
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.

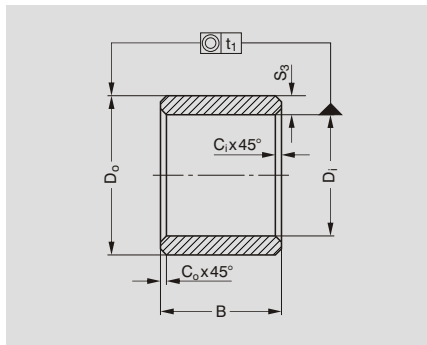
Note: dividing and shortening is not carried out by GGB.

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) - material properties see page 30**



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

Part No.	Technical Data				Installation tolerance Housing Journal
	Dimensions			Weight g	
GGB	Inside $\varnothing$ $D_i$	Outside $\varnothing$ $D_o$	Width B		
384425BP25	38	44	25	64,4	H7 f7
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	
505640BP25	50	56	40	133,9	
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.

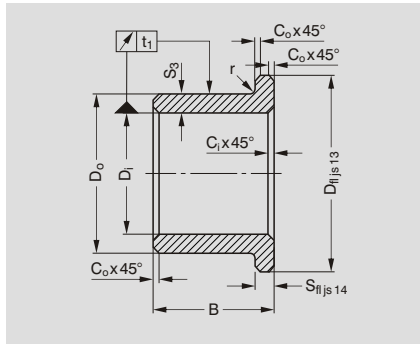
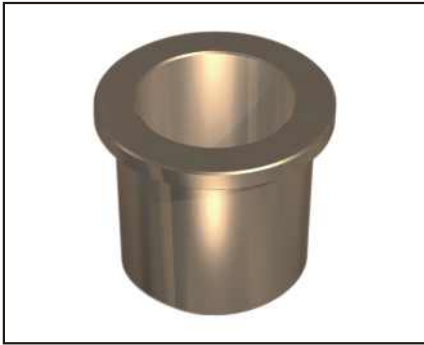
Note: dividing and shortening is not carried out by GGB.

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) - material properties see page 30



$t_1$  for  $D_i \leq 20 \text{ mm} = 60 \mu\text{m}$   
 $t_1$  for  $20 \text{ mm} < D_i \leq 35 \text{ mm} = 80 \mu\text{m}$   
 $t_1$  for  $D_i > 35 = 100 \mu\text{m}$   
 chamfers  $C = (0,1 \text{ to } 0,2) S_3$   
 minimum 0,2 mm  
 $r = \max. 0,3 \times S_3$   
 $B > 10 \pm 1\%$   
 $B \leq 10 \pm 0,1 \text{ mm}$

Part No.	Technical Data						Installation tolerance Housing Journal
	Dimensions						
GGB	Inside $\varnothing D_i$	Outside $\varnothing D_o$	Flange $\varnothing D_{fl}$	Width B	Flange width $S_{fl}$	Weight g	
BB030604BP25	3	6	9	4	1,5	0,9	H7 f7
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	
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	

Part No.	Technical Data						Installation tolerance Housing Journal
	Dimensions						
GGB	Inside $\varnothing D_i$	Outside $\varnothing D_o$	Flange $\varnothing D_{fl}$	Width B	Flange width $S_{fl}$	Weight g	
BB162016BP25	16	20	24	16	2,0	14,0	H7 f7
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	
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 Bearing Material

Self-lubricating (oil-impregnated)

## Sinterbronze flanged bushes (similar to Sint A 50) - material properties see page 30



After the bushes have been pressed into a H7 housing hole using an m6 mandrel, cylindrical bushes have an H7 inside diameter (H8 for  $\varnothing \geq 50$  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						Installation tolerance Housing Journal
	Dimensions						
GGB	Inside $\varnothing D_i$	Outside $\varnothing D_o$	Flange $\varnothing D_{fl}$	Width B	Flange width $S_{fl}$	Weight g	
BB323820BP25	32	38	44	20	3,0	51,9	H7 f7
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	
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.

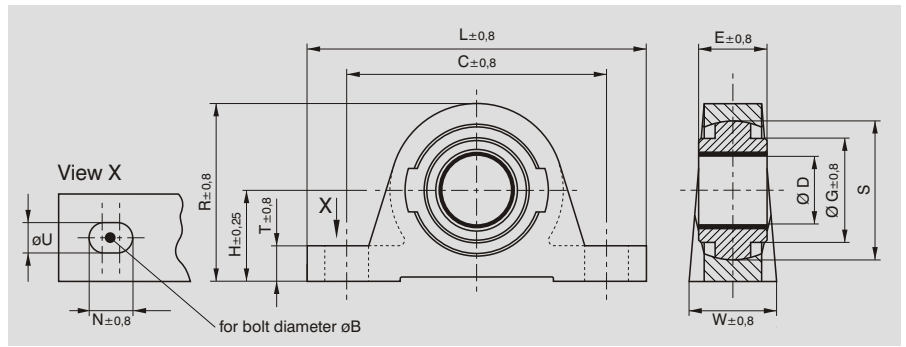
Note: dividing and shortening is not carried out by GGB.

Tolerances applicable for wall thicknesses <4 mm. For wall thicknesses of 4 mm and more please consult GGB.

# EXALIGN™ self-aligning Bearing Housing

Adjustable bearing

## PB Pedestal Bearing Housing - material properties see page 32

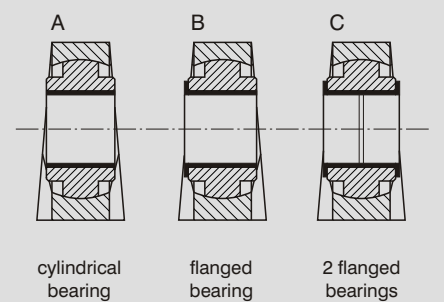


Housing material: GG 20  
 Ball bearing material: GG 20  
 Stainless and corrosion-resistant version on request.

### Ordering example:

Size Design  
**PB1-10M-B-DU** — Bush material  
 Pedestal bearing metric Standard bush D<sub>i</sub>

### Design:



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

Other dimensions on request.

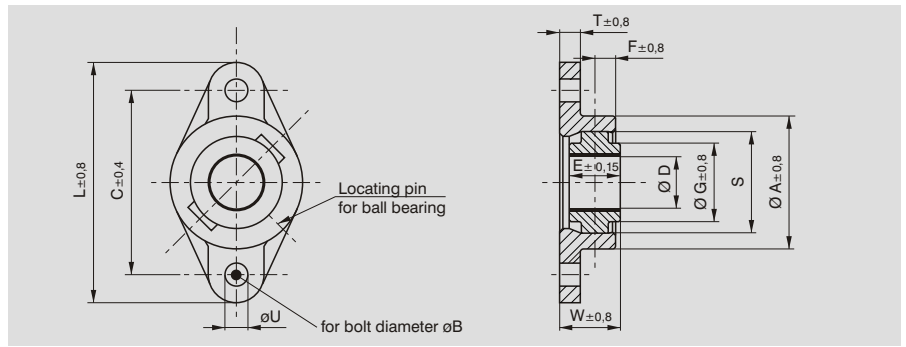
\*Dimension D is with the standard bush pressed in.



# EXALIGN™ self-aligning Bearing Housing

Adjustable bearing

## DF Flange Bearing Housing - material properties see page 32



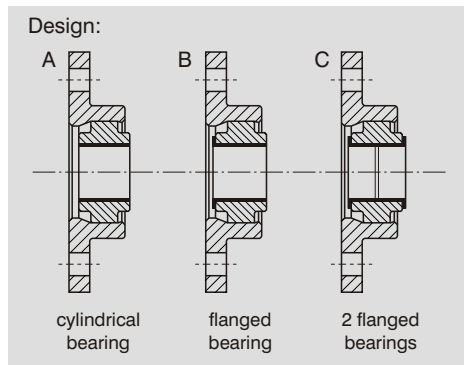
Housing material: GG 20

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<sub>i</sub>



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

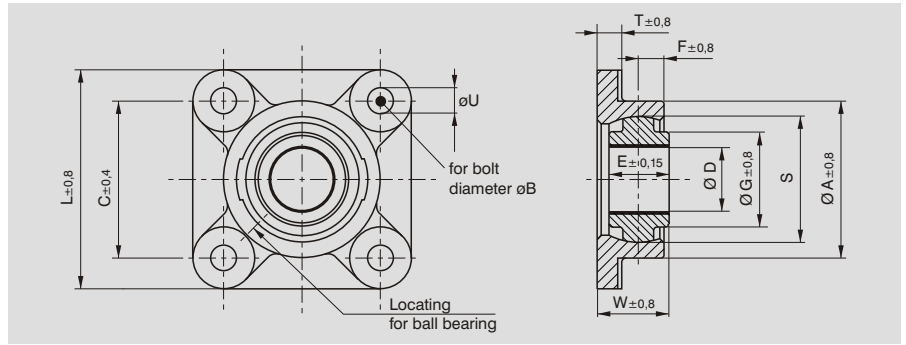
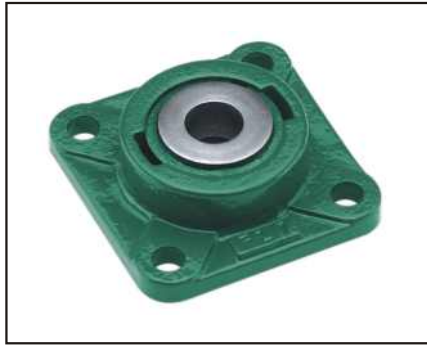
Other dimensions on request.

\*Dimension D is with the standard bush pressed in.

# EXALIGN™ self-aligning Bearing Housing

Adjustable bearing

## FL Flange Bearing Housing - material properties see page 32



Housing material: GG 20

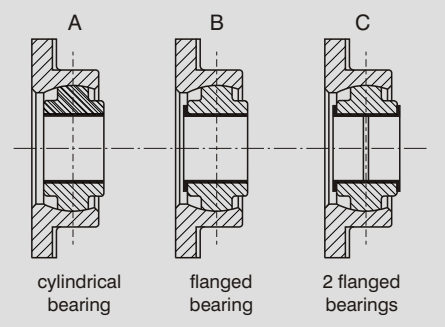
Ball bearing material: GG 20

Stainless and corrosion-resistant version on request.

### Ordering example:

Size Design  
**FL1-10M-B-DU** — Bush material  
 Pedestal bearing metric Standard bush D<sub>i</sub>

### Design:



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

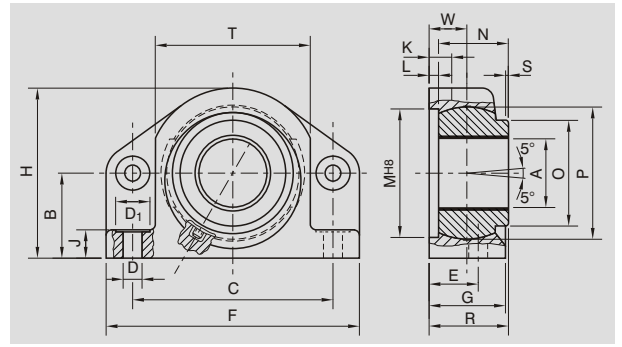
# UNI™ self-aligning Bearing Housing

Adjustable bearing

## UNI™ Bearing Housing - material properties see page 32



- 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

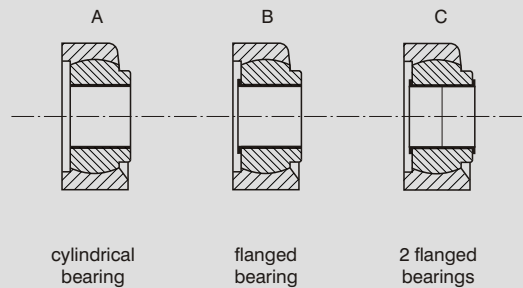
Size	Ø range A	B	C	D	D <sub>1</sub>	E	F	G	H	J	K	L	M	N	O	P	R	S	T	W
1	10 - 25	28	72	8,5	13,5	15	95	25	56	12	8	3	46	20	34	42	23	0,5 x 45°	52	11
2	30 - 40	42	104	10,5	18	25	130	41	84	14	14	5	72	40	51	68	45	2 x 45°	83	20
3	45 - 60	60	142	13,5	27	35	180	55	120	20	15	7	92	50	74	95	57	1 x 45°	112	27
4	65 - 80	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.	Weight kg
<b>GGB</b>	
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

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<sub>1</sub>

Design:



Other dimensions on request.

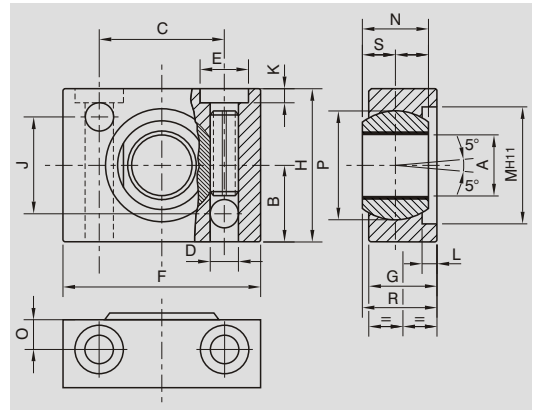
# MINI™ self-aligning Bearing Housing

Adjustable bearing

## MINI™ Bearing Housing - material properties see page 34



- 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.



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

Housing material: AlMgSi12  
Ball bearing material: 9SMn28K

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

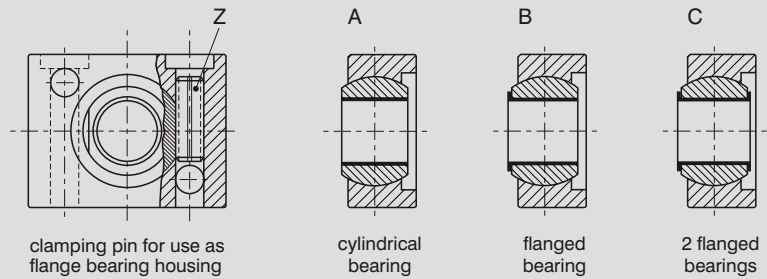
### Ordering example:

Size Design  
**MINI-0-8-BZ-DU** — Bush material  
 Standard bush D<sub>i</sub> — Clamping pin

Part No.	Weight g
<b>GGB</b>	
Size Ø	
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:





# GGB Manufacturing Overview

## Key Plants



France, Anney



USA, Thorofare 1

## Special and Local Plants



USA, Thorofare 2



USA, Chicago



France, Dieuze



Germany, Heilbronn



Brazil, Barueri SP



Slovakia, Sučany



Germany, Sinsheim



China, Suzhou

# Sales Areas





# Data Sheet



## Data for bearing design calculation

Application: \_\_\_\_\_

Project / No.: \_\_\_\_\_

Quantity: \_\_\_\_\_  New Design  Existing Design

Dimensions [mm]	
Inside diameter	$D_i$
Outside diameter	$D_o$
Length	B
Flange diameter	$S_{fl}$
Flange thickness	$B_{fl}$
Wall thickness	$S_T$
Length of slideplate	L
Width of slideplate	W
Thickness of slideplate	$S_s$

Load	
<input type="checkbox"/> Radial load F	
- static [N]	
- dynamic [N]	
<input type="checkbox"/> Axial load F	
- static [N]	
- dynamic [N]	
<input type="checkbox"/> 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 $\varphi$ [°]	
Oscillating freq. $N_{OSZ}$ [1/min]	

Mating Surface	
Material	
Hardness HB/HRC	
Surface finish Ra [ $\mu$ m]	

Fits and Tolerances	
Shaft	$D_J$
Bearing housing	$D_H$

Operating Environment	
Ambient temperature $T_{amb}$ [°]	
<input type="checkbox"/> Housing with good heating transfer properties	
<input type="checkbox"/> Light pressing or insulated housing with poor heat transfer properties	
<input type="checkbox"/> Non metal housing with poor heat transfer properties	
<input type="checkbox"/> Alternate operation in water and dry	

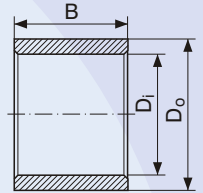
Lubrication	
<input type="checkbox"/> Dry	
<input type="checkbox"/> Continuous lubrication	
<input type="checkbox"/> Process fluid lubrication	
<input type="checkbox"/> Initial lubrication only	
<input type="checkbox"/> Hydrodynamic conditions	
Process fluid	
Lubricant	
Dynamic viscosity $\eta$	

Service Hours per Day	
Continuous operation	
Intermittent operation	
Operating time	
Days per year	

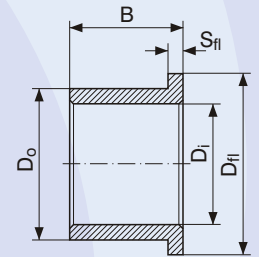
Service Life	
Required service life $L_H$ [h]	

### Bearing Type:

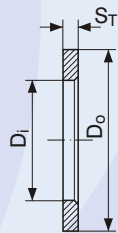
Cylindrical bush



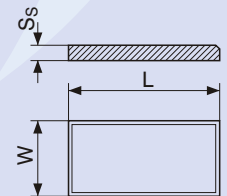
Flanged bush



Thrust washer



Slideplate



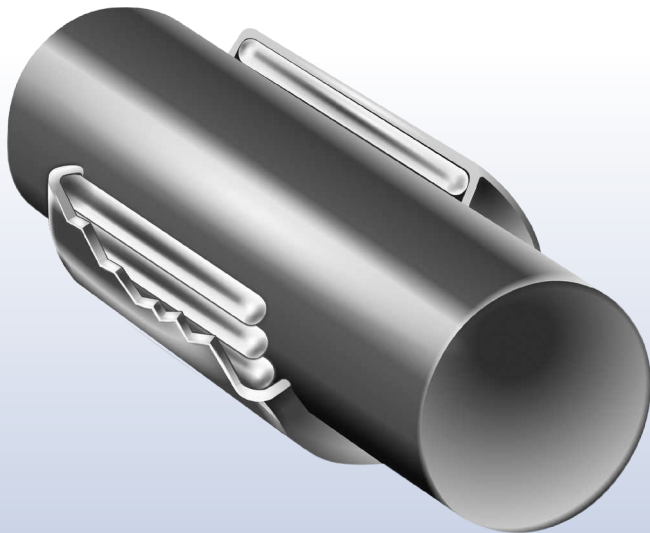
Special parts (sketch)

- Rotational movement
- Steady load
- Rotating load
- Oscillating movement
- Linear movement

Customer Information	
Company	_____
Street	_____
City / Post Code	_____
Name	_____
Tel.	_____
Fax	_____
Date / Signature	_____

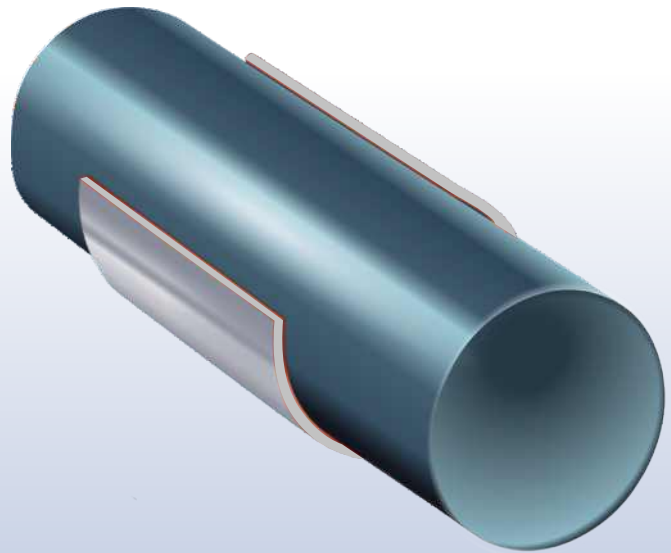
# Roller Bearing Replacement Cuts Costs!

Replace this . . .



Noisier, bulkier, harder to assemble and relatively expensive!

with **GGB** high performance plain bearings.



Quiet, slim, easy to assemble and inexpensive!

- Eliminate Shaft Hardening Costs!
- Reduce Installation Costs!
- Reduce Costs via Weight and Space Reduction!
- Reduce Piece Part Costs!

**Examples of equipment where rolling element bearings have been replaced by GGB plain bearings;**

**Automotive:** steering gear, AC compressors, transmissions, planetary gears, gear shift mechanisms, differentials, pumps, valve gear rocker arms, air baffle actuators, throttle butterfly valves, etc.

**Industrial:** hydraulic pumps & motors, injection moulding / special purpose machines, hydroelectric installations, agricultural machinery, work platforms, mechanical handling equipment, aerospace, oil drilling / mining equipment, vehicle dock levellers, bridges & locks, railway equipment, wind turbines, elevators, robots, concrete, cement & asphalt mixers, medical / dental equipment, etc.

For more information about rolling element bearing replacement visit: <http://www.ggbearings.com/needle/> or contact GGB to establish if your application is suitable for replacement by GGB plain bearings.



an EnPro Industries company