

DURARUB®

Filament-wound Bearings





- CSB was established in 1995 and its legal registered capital is 223 million RMB.
- Annual turnover more than 1 Billion RMB, more than 1000 employees.
- CSB has 5 production bases with a total area of 200000m².
- China National Hi-Tech Enterprise, more than 120 patents.
- IATF16949: 2016、ISO9001: 2015、ISO14001: 2015 and ISO45001: 2018 certifications.

...High-performance Polymer Technologies Creating Value For Customers

EC Directive 2011/65/EU (the RoHS Directive)

Hg、Cr⁶⁺、Pb、Cd、PBDE、PBB、DBP、BBP、DEHP、HBCDD。

This directive restricts the use of hazardous substances. Listed below are CSB products which are all RoHS compliant.



"CSB", "TEFPLAS", "TEXPLAS", "DURAPLAS", "DURARUB", "DURAFILM", "TRIBOTAPE", "DURAMOV", "FLEXMOV", "CSB-EPB", "CSB-LIN", "CSB-BAL", "CSB-RPM", "CSB-SRB", "CSB-PRB", etc. are legally protected trademarks in China.



Polymer-tech Solutions™



CSB-EPB® Plastic Plain Bearings

Maintenance-free dry operation, Absolute corrosion resistance, Long service time and light; Multiple choices: Lowest friction coefficient, High load, Anti-static, High temperature 250°C, FDA food safety grade.



CSB-LIN® Plastic Linear Bearings

Dry operation without oil, Anti-dust, Low noise, Corrosion resistance, Longer service time and light; Multiple Assemble types, Highest operation temperature 250°C.



CSB-LIN® Guide Rails and Lead Screws

Self-lubricating and maintenance-free linear motion system, Linear slider and screw nuts are made of high wear-resistant material EPB13, Dry operation for longer time, lower noise, longer service time and suitable for operation in dust or dirty water.



CSB-BAL® Plastic Spherical Bearings

Self-lubricating and maintenance-free, Corrosion-resistant, Anti-fouling, lightweight; Multiple structural design to meet different installation requirements.



DURARUB® Filament-wound Bearings

Long fiber composite material, The best performance for dry operation, High load capacity and max. static load 240MPa, Especially suitable for swing with high load and low speed.



DURAPLAS® Semi-finished Products

The semi-finished products are made of anti-wear and high performance materials CSB-EPB®, It can be machined non-standard bearings in short time, saving cost for small quantity; Multiple choices: Bar, sheet and tribo-tape.



DURAMOV® Plastic Cable Carriers

The cable carriers are made of high strength and anti-wear plastics, The cable carriers are used in a variety of motion modes and strokes, modular design is easy to assemble and maintain, and it is suitable for low noise long life in various environments.



FLEXMOV® Flexible Cables

FLEXMOV® flexible cables include control cables, data cables, servo cables, motor cables, bus cables, robot cables, etc.; Various jacket materials such as PVC、PUR and TPE are available to meet trouble-free operation in extreme environments such as indoors or outdoors.

<https://www.csb-ep.com>

Products

CSB®

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CSB-EPB® Plastic Plain Bearings



CSB-LIN® Plastic Linear Bearings



CSB-PRB® Plastic Ball Bearings



CSB-BAL® Plastic Spherical Bearings



CSB-LIN® Guide rails & Screw nuts



CSB® Automation technology



CSB-SRB® Slewing Ring Bearings



CSB-RPM® Steering Rack Bearings



TEFPLAS® Fluoroplastic Bearing



KER Knife Edge Rollers



DURACHAIN® Escalator Rotary Chains



DURAMOV® Cable Carriers FLEXMOV® Flexible Cables



DURAPLAS® Semi-finished Products



DURARUB® Filament-wound Bearings



DURARUB® Composite sliding pads



Metal Sliding Bearings





▶▶▶..... please visit: www.csb-ep.com



Material structure

The back material of DURARUB® materials is high strength glass fiber with epoxy resin and the lubricating layer of it is PTFE wound fiber or special lubricating fiber. Therefore, this special structure performs an outstanding anti-wear feature and low friction coefficient under high load and low speed condition. Furthermore, this absolutely new idea gives better solution for high load and excellent wear resistance possibility.

Typical features

- Very high load capacity, Max. 160Mpa;
- Very good chemical resistance;
- Lower friction and good wear properties. Friction coefficient<0.12;
- Long time dry operation without oil.

Technical data table

Material properties	Standard	Unit							
			CRB	CRG	CRH	CRM	CRP	CRW	CRF
Density	ISO1183	g/cm ³	1.90	1.90	1.90	1.90	1.90	1.90	1.30
Max. water absorption	ISO62	%	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Max. PV (dry)	ITS026	N/mm ² ×m/s	1.5	1.5	1.5	1.2	1.0	1.2	1.0
Coefficient of friction	ITS025	μ	0.03~0.12	0.03~0.12	0.03~0.12	0.05~0.15	0.03~0.12	0.05 ~ 0.15	0.05~0.15
Long-term application temperature	ITS029	°C	+160	+160	+200	+160	+160	+160	+130
Short-term application temperature	ITS029	°C	+180	+180	+260	+180	+180	+180	+160
Lowest application temperature	ITS029	°C	-196	-196	-196	-196	-196	-196	-40
Max. Speed (dry)	ITS032	m/s	0.13	0.13	0.13	0.13	0.50	0.13	0.13
Compressive strength	ITS033	MPa	420	420	620	420	420	420	150
Max. static load	ITS027	MPa	240	240	420	240	240	240	150
Max. dynamic load	ITS028	MPa	140	140	160	120	30	120	75
Linear coef. of thermal Expansion (20 ~ 100°C)	ISO11359	10 ⁻⁶ ×K ⁻¹	13	13	13	13	13	13	50

*ITS: CSB company's internal test standards.

**Test temperatures are 23°C unless otherwise stated.

CRB Bearings



■ Material structure

Sliding layer: Continuous wound PTFE and high-strength fibers encapsulated in an internally lubricated, high temperature filled epoxy resin.

Backing: Continuous wound glass fiber encapsulated in epoxy resin.

Technical data

Material properties	Standard	Unit	CRB
Density	ISO1183	g/cm ³	1.90
Max. water absorption	ISO62	%	0.1
Max. PV (dry)	ITS026	N/mm ² ×m/s	1.5
Coefficient of friction	ITS025	μ	0.03~0.12
Long-term application temperature	ITS029	°C	+160
Short-term application temperature	ITS029	°C	+180
Lowest application temperature	ITS029	°C	-196
Max. Speed	ITS032	m/s	0.13
Compressive strength	ITS033	MPa	420
Max. static load	ITS027	MPa	240
Max. dynamic load	ITS028	MPa	140
Linear coef. of thermal Expansion (25 ~ 150°C)	ISO11359	10 ⁻⁶ ×K ⁻¹	13

*ITS: CSB company's internal test standards.

**Test temperatures are 23°C unless otherwise stated.

Typical features

For high load oscillation applications
 Excellent wear resistance
 Very good chemical resistance
 Lower friction coefficient
 Oil forbidden



Typical applications

Hydraulic cylinder pivots
 Boom lifts, scissor lifts
 Cranes, material handling equipment
 Construction machinery arm bushes
 Port machinery

CRG Bearings



■ Material structure

Sliding layer: Continuous wound PTFE and high-strength fibers encapsulated in an internally lubricated, high-temperature and high-strength filled epoxy resin.

Backing: Continuous wound glass fiber encapsulated in high-strength epoxy resin.

Technical data

Material properties	Standard	Unit	CRG
Density	ISO1183	g/cm ³	1.90
Max. water absorption	ISO62	%	0.1
Max. PV (dry)	ITS026	N/mm ² ×m/s	1.5
Coefficient of friction	ITS025	μ	0.03~0.12
Long-term application temperature	ITS029	°C	+160
Short-term application temperature	ITS029	°C	+180
Lowest application temperature	ITS029	°C	-196
Max. Speed	ITS032	m/s	0.13
Compressive strength	ITS033	MPa	420
Max. static load	ITS027	MPa	240
Max. dynamic load	ITS028	MPa	160
Linear coef. of thermal Expansion (25 ~ 150°C)	ISO11359	10 ⁻⁶ ×K ⁻¹	13

*ITS: CSB company's internal test standards.

**Test temperatures are 23°C unless otherwise stated.

Typical features

For high load oscillation and rotation applications

Excellent wear resistance

Very good chemical resistance

Low friction coefficient

Oil forbidden



Typical applications

Hydraulic cylinder pivots

Boom lifts, scissor lifts

Cranes, material handling equipment

Construction machinery arm bushes

Port machinery

CRH Bearings



■ Material structure

Sliding layer: Continuous wound PTFE and high-strength fibers encapsulated in an internally lubricated, high temperature and high-strength filled epoxy resin.

Backing: Continuous wound glass fiber encapsulated in a high temperature epoxy resin.

Technical data

Material properties	Standard	Unit	CRH
Density	ISO1183	g/cm ³	1.90
Max. water absorption	ISO62	%	0.1
Max. PV (dry)	ITS026	N/mm ² ×m/s	1.5
Coefficient of friction	ITS025	μ	0.03~0.12
Long-term application temperature	ITS029	°C	+200
Short-term application temperature	ITS029	°C	+260
Lowest application temperature	ITS029	°C	-196
Max. Speed	ITS032	m/s	0.13
Compressive strength	ITS033	MPa	620
Max. static load	ITS027	MPa	420
Max. dynamic load	ITS028	MPa	160
Linear coef. of thermal Expansion (25 ~ 150°C)	ISO11359	10 ⁻⁶ ×K ⁻¹	13

*ITS: CSB company's internal test standards.

**Test temperatures are 23°C unless otherwise stated.

Typical features

Extreme load applications in oscillation and rotation
 High temperature applications
 Extremely Wear resistance
 Strong corrosion resistance
 Oil forbidden



Typical applications

Hydraulic cylinder pivots
 Boom lifts
 Cranes equipment
 Construction machinery arm bushes
 Port machinery

CRM Bearings



■ Material structure

Sliding layer: Continuous wound PTFE and high-strength fibers encapsulated in an internally lubricated, high temperature filled epoxy resin.

Backing: Continuous wound glass fiber encapsulated in epoxy resin.

Technical data

Material properties	Standard	Unit	CRM
Density	ISO1183	g/cm ³	1.90
Max. water absorption	ISO62	%	0.1
Max. PV (dry)	ITS026	N/mm ² ×m/s	1.2
Coefficient of friction	ITS025	μ	0.05~0.15
Long-term application temperature	ITS029	°C	+160
Short-term application temperature	ITS029	°C	+180
Lowest application temperature	ITS029	°C	-196
Max. Speed	ITS032	m/s	0.13
Compressive strength	ITS033	MPa	420
Max. static load	ITS027	MPa	240
Max. dynamic load	ITS028	MPa	120
Linear coef. of thermal Expansion (25 ~ 150°C)	ISO11359	10 ⁻⁶ ×K ⁻¹	13

*ITS: CSB company's internal test standards.

**Test temperatures are 23°C unless otherwise stated.

Typical features

For high load oscillation applications
Internal bore can be precision-finished
Excellent contamination resistance
Good chemical resistance
Oil forbidden



Typical applications

Boom lifts, Scissor lifts
Hydraulic cylinder pivots
Handling machinery
Packager machinery

CRP Bearings



■ Material structure

Sliding layer: Fibers and PTFE compound tape as internally lubricating layer.

Backing: Continuous wound glass fiber encapsulated in epoxy resin.

Technical data

Material properties	Standard	Unit	CRP
Density	ISO1183	g/cm ³	1.90
Max. water absorption	ISO62	%	0.1
Max. PV (dry)	ITS026	N/mm ² ×m/s	1.0
Coefficient of friction	ITS025	μ	0.03~0.12
Long-term application temperature	ITS029	°C	+160
Short-term application temperature	ITS029	°C	+180
Lowest application temperature	ITS029	°C	-196
Max. Speed	ITS032	m/s	0.50
Compressive strength	ITS033	MPa	420
Max. static load	ITS027	MPa	240
Max. dynamic load	ITS028	MPa	30
Linear coef. of thermal Expansion (25 ~ 150°C)	ISO11359	10 ⁻⁶ ×K ⁻¹	13

*ITS: CSB company's internal test standards.

**Test temperatures are 23°C unless otherwise stated.

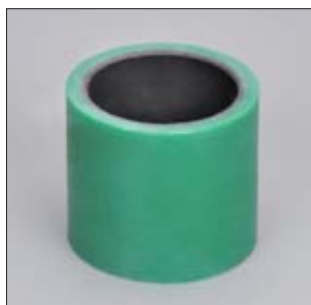
Typical features

Low friction coefficient
High motion speed
Suitable for linear motion
Internal bore can be precision-finished
Oil allowed

Typical applications

Ball and butterfly trunnion bearing
Air pump guide bushes
Tie-bar guide bearing
Hydraulic pressure machinery

CRW Bearings



■ Material structure

Sliding layer: Continuous wound PTFE and high-strength fibers encapsulated in an internally water lubricated, high temperature filled epoxy resin.

Backing: Continuous wound glass fiber encapsulated in epoxy resin.

Technical data

Material properties	Standard	Unit	CRW
Density	ISO1183	g/cm ³	1.90
Max. water absorption	ISO62	%	0.1
Max. PV (dry)	ITS026	N/mm ² ×m/s	1.2
Coefficient of friction	ITS025	μ	0.05 ~ 0.15
Long-term application temperature	ITS029	°C	+160
Short-term application temperature	ITS029	°C	+180
Lowest application temperature	ITS029	°C	-196
Max. Speed	ITS032	m/s	0.13
Compressive strength	ITS033	MPa	420
Max. static load	ITS027	MPa	240
Max. dynamic load	ITS028	MPa	120
Linear coef. of thermal Expansion (25 ~ 150°C)	ISO11359	10 ⁻⁶ ×K ⁻¹	13

*ITS: CSB company's internal test standards.

**Test temperatures are 23°C unless otherwise stated.

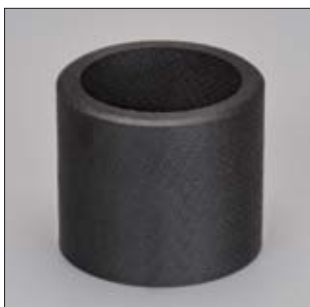
Typical features

Excellent anti-wear property under water
 High load capacity
 Excellent dirty resistance
 Good chemical resistance
 Very lowest friction coefficient

Typical applications

Marine machinery
 Port machinery
 Hydropower equipment
 Cleaning equipment

CRF Bearings



■ Material structure

Materials: Continuous wound high-strength fiber encapsulated in a special internally lubricated, high-strength filled resin.

Technical data

Material properties	Standard	Unit	CRF
Density	ISO1183	g/cm ³	1.30
Max. water absorption	ISO62	%	0.1
Max. PV (dry)	ITS026	N/mm ² ×m/s	1.0
Coefficient of friction	ITS025	μ	0.05~0.15
Long-term application temperature	ITS029	°C	+130
Short-term application temperature	ITS029	°C	+160
Lowest application temperature	ITS029	°C	-40
Max. Speed	ITS032	m/s	0.13
Compressive strength	ITS033	MPa	150
Max. static load	ITS027	MPa	150
Max. dynamic load	ITS028	MPa	75
Linear coef. of thermal Expansion (25 ~ 150°C)	ISO11359	10 ⁻⁶ ×K ⁻¹	50

*ITS: CSB company's internal test standards.

**Test temperatures are 23°C unless otherwise stated.

Typical features

Suitable for oil and water lubricating applications
 Excellent wear resistance in liquids
 Completely machinable
 Oil allowed

Typical applications

Marine and hydraulic machinery
 Door bushes
 Cylinder guide bushing
 Piston guide ring

DURARUB® Standard specifications (wall 2.5mm)

Specifications:

Part No.:

CRB-20 25-30

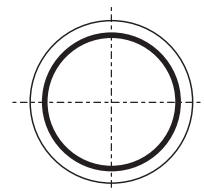
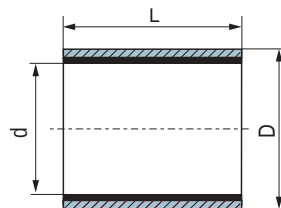
Length

Outer diameter

Inner diameter

Materials:

CRM, CRB, CRG, CRH, CRP, CRW, CRF



		L		
Length tolerance table		≤75 mm	> 75 to < 150 mm	≥150 mm
d	≤75 mm	-0.50 mm	-1.00 mm	-1.50 mm
	> 75 to ≤120 mm	-1.00 mm	-1.00 mm	-1.50 mm
	> 120 to ≤150 mm	-1.00 mm	-1.50 mm	-1.50 mm

Part No.	Bearing Size		Recommend		Assembly Interference	Standard Length L
	d	D	Shaft D _s h7	Housing H7 D _h		
CRB-2025-L	20 ^{+0.200} _{+0.120}	25 ^{+0.100} _{+0.050}	20 ⁰ _{-0.021}	25 ^{+0.021} ₀	0.029-0.100	15、20、30
CRB-2227-L	22 ^{+0.200} _{+0.120}	27 ^{+0.100} _{+0.050}	22 ⁰ _{-0.021}	27 ^{+0.021} ₀	0.029-0.100	15、20、30
CRB-2530-L	25 ^{+0.200} _{+0.120}	30 ^{+0.100} _{+0.050}	25 ⁰ _{-0.021}	30 ^{+0.021} ₀	0.029-0.100	20、30、40
CRB-2833-L	28 ^{+0.200} _{+0.120}	33 ^{+0.100} _{+0.050}	28 ⁰ _{-0.021}	33 ^{+0.025} ₀	0.025-0.100	20、30、40
CRB-3035-L	30 ^{+0.200} _{+0.120}	35 ^{+0.100} _{+0.050}	30 ⁰ _{-0.021}	35 ^{+0.025} ₀	0.025-0.100	20、30、40
CRB-3540-L	35 ^{+0.200} _{+0.120}	40 ^{+0.100} _{+0.050}	35 ⁰ _{-0.025}	40 ^{+0.025} ₀	0.025-0.100	30、40、50
CRB-4045-L	40 ^{+0.200} _{+0.120}	45 ^{+0.100} _{+0.050}	40 ⁰ _{-0.025}	45 ^{+0.025} ₀	0.025-0.100	30、40、60
CRB-4550-L	45 ^{+0.230} _{+0.130}	50 ^{+0.105} _{+0.055}	45 ⁰ _{-0.025}	50 ^{+0.025} ₀	0.030-0.105	30、40、60
CRB-5055-L	50 ^{+0.230} _{+0.130}	55 ^{+0.105} _{+0.055}	50 ⁰ _{-0.025}	55 ^{+0.030} ₀	0.025-0.100	40、50、60
CRB-5560-L	55 ^{+0.245} _{+0.145}	60 ^{+0.120} _{+0.070}	55 ⁰ _{-0.030}	60 ^{+0.030} ₀	0.040-0.120	40、55、70
CRB-6065-L	60 ^{+0.245} _{+0.145}	65 ^{+0.120} _{+0.070}	60 ⁰ _{-0.030}	65 ^{+0.030} ₀	0.040-0.120	40、60、80
CRB-6570-L	65 ^{+0.245} _{+0.145}	70 ^{+0.120} _{+0.070}	65 ⁰ _{-0.030}	70 ^{+0.030} ₀	0.040-0.120	50、60、80
CRB-7075-L	70 ^{+0.245} _{+0.145}	75 ^{+0.120} _{+0.070}	70 ⁰ _{-0.030}	75 ^{+0.030} ₀	0.040-0.120	50、70、90
CRB-7580-L	75 ^{+0.275} _{+0.175}	80 ^{+0.120} _{+0.070}	75 ⁰ _{-0.030}	80 ^{+0.030} ₀	0.040-0.120	50、70、90
CRB-8085-L	80 ^{+0.275} _{+0.175}	85 ^{+0.125} _{+0.075}	80 ⁰ _{-0.030}	85 ^{+0.035} ₀	0.040-0.125	60、80、100
CRB-8590-L	85 ^{+0.275} _{+0.175}	90 ^{+0.125} _{+0.075}	85 ⁰ _{-0.035}	90 ^{+0.035} ₀	0.040-0.125	60、80、100
CRB-9095-L	90 ^{+0.275} _{+0.175}	95 ^{+0.125} _{+0.075}	90 ⁰ _{-0.035}	95 ^{+0.035} ₀	0.040-0.125	60、80、120
CRB-95100-L	95 ^{+0.310} _{+0.185}	100 ^{+0.125} _{+0.075}	95 ⁰ _{-0.035}	100 ^{+0.035} ₀	0.040-0.125	60、80、120
CRB-100105-L	100 ^{+0.310} _{+0.185}	105 ^{+0.125} _{+0.075}	100 ⁰ _{-0.035}	105 ^{+0.035} ₀	0.040-0.125	80、100、120
CRB-110115-L	110 ^{+0.315} _{+0.190}	115 ^{+0.135} _{+0.085}	110 ⁰ _{-0.035}	115 ^{+0.035} ₀	0.050-0.135	80、100、120
CRB-120125-L	120 ^{+0.340} _{+0.215}	125 ^{+0.135} _{+0.085}	120 ⁰ _{-0.035}	125 ^{+0.040} ₀	0.045-0.135	100、120、150
CRB-130135-L	130 ^{+0.340} _{+0.215}	135 ^{+0.165} _{+0.090}	130 ⁰ _{-0.040}	135 ^{+0.040} ₀	0.050-0.165	100、120、150
CRB-140145-L	140 ^{+0.340} _{+0.215}	145 ^{+0.165} _{+0.090}	140 ⁰ _{-0.040}	145 ^{+0.040} ₀	0.050-0.165	100、150、180
CRB-150155-L	150 ^{+0.340} _{+0.215}	155 ^{+0.165} _{+0.090}	150 ⁰ _{-0.040}	155 ^{+0.040} ₀	0.050-0.165	120、150、180

DURARUB® Standard specifications (wall 5mm)

Specifications:

Part No.:

CRB-20 30-30

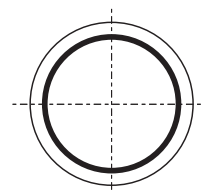
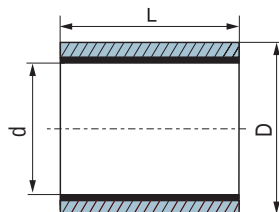
Length

Outer diameter

Inner diameter

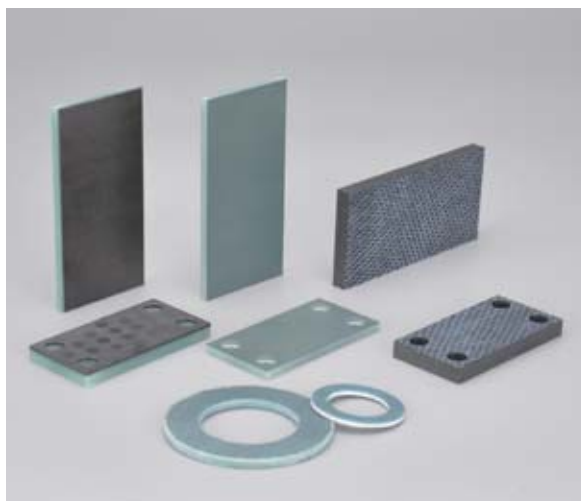
Materials:

CRM, CRB, CRG, CRH, CRP, CRW, CRF



Length tolerance table		L		
		≤75 mm	> 75 to < 150 mm	≥150 mm
d	≤75 mm	-0.50 mm	-1.00 mm	-1.50 mm
	> 75 to ≤120 mm	-1.00 mm	-1.00 mm	-1.50 mm
	> 120 to ≤150 mm	-1.00 mm	-1.50 mm	-1.50 mm

Part No.	Bearing Size		Recommend		Assembly Interference	Standard Length L
	d	D	Shaft D _s h7	Housing H7 D _h		
CRB-2030-L	20 ^{+0.200} _{+0.120}	30 ^{+0.100} _{+0.050}	20 ⁰ _{-0.021}	30 ^{+0.021} ₀	0.029-0.100	15、20、30
CRB-2232-L	22 ^{+0.200} _{+0.120}	32 ^{+0.100} _{+0.050}	22 ⁰ _{-0.021}	32 ^{+0.025} ₀	0.025-0.100	15、20、30
CRB-2535-L	25 ^{+0.200} _{+0.120}	35 ^{+0.100} _{+0.050}	25 ⁰ _{-0.021}	35 ^{+0.025} ₀	0.025-0.100	20、30、40
CRB-2838-L	28 ^{+0.200} _{+0.120}	38 ^{+0.100} _{+0.050}	28 ⁰ _{-0.021}	38 ^{+0.025} ₀	0.025-0.100	20、30、40
CRB-3040-L	30 ^{+0.200} _{+0.120}	40 ^{+0.100} _{+0.050}	30 ⁰ _{-0.021}	40 ^{+0.025} ₀	0.025-0.100	20、30、40
CRB-3545-L	35 ^{+0.200} _{+0.120}	45 ^{+0.100} _{+0.050}	35 ⁰ _{-0.025}	45 ^{+0.025} ₀	0.025-0.100	30、40、50
CRB-4050-L	40 ^{+0.200} _{+0.120}	50 ^{+0.100} _{+0.050}	40 ⁰ _{-0.025}	50 ^{+0.025} ₀	0.025-0.100	30、40、60
CRB-4555-L	45 ^{+0.230} _{+0.130}	55 ^{+0.105} _{+0.055}	45 ⁰ _{-0.025}	55 ^{+0.030} ₀	0.025-0.105	30、40、60
CRB-5060-L	50 ^{+0.230} _{+0.130}	60 ^{+0.105} _{+0.055}	50 ⁰ _{-0.025}	60 ^{+0.030} ₀	0.025-0.105	40、50、60
CRB-5565-L	55 ^{+0.245} _{+0.145}	65 ^{+0.120} _{+0.070}	55 ⁰ _{-0.030}	65 ^{+0.030} ₀	0.040-0.120	40、55、70
CRB-6070-L	60 ^{+0.245} _{+0.145}	70 ^{+0.120} _{+0.070}	60 ⁰ _{-0.030}	70 ^{+0.030} ₀	0.040-0.120	40、60、80
CRB-6575-L	65 ^{+0.245} _{+0.145}	75 ^{+0.120} _{+0.070}	65 ⁰ _{-0.030}	75 ^{+0.030} ₀	0.040-0.120	50、60、80
CRB-7080-L	70 ^{+0.245} _{+0.145}	80 ^{+0.120} _{+0.070}	70 ⁰ _{-0.030}	80 ^{+0.030} ₀	0.040-0.120	50、70、90
CRB-7585-L	75 ^{+0.275} _{+0.175}	85 ^{+0.125} _{+0.075}	75 ⁰ _{-0.030}	85 ^{+0.035} ₀	0.040-0.125	50、70、90
CRB-8090-L	80 ^{+0.275} _{+0.175}	90 ^{+0.125} _{+0.075}	80 ⁰ _{-0.030}	90 ^{+0.035} ₀	0.040-0.125	60、80、100
CRB-8595-L	85 ^{+0.275} _{+0.175}	95 ^{+0.125} _{+0.075}	85 ⁰ _{-0.035}	95 ^{+0.035} ₀	0.040-0.125	60、80、100
CRB-90100-L	90 ^{+0.275} _{+0.175}	100 ^{+0.125} _{+0.075}	90 ⁰ _{-0.035}	100 ^{+0.035} ₀	0.040-0.125	60、80、120
CRB-95105-L	95 ^{+0.310} _{+0.185}	105 ^{+0.125} _{+0.075}	95 ⁰ _{-0.035}	105 ^{+0.035} ₀	0.040-0.125	60、80、120
CRB-100110-L	100 ^{+0.310} _{+0.185}	110 ^{+0.135} _{+0.085}	100 ⁰ _{-0.035}	110 ^{+0.035} ₀	0.050-0.135	80、100、120
CRB-110120-L	110 ^{+0.315} _{+0.190}	120 ^{+0.135} _{+0.085}	110 ⁰ _{-0.035}	120 ^{+0.035} ₀	0.050-0.135	80、100、120
CRB-120130-L	120 ^{+0.340} _{+0.215}	130 ^{+0.165} _{+0.090}	120 ⁰ _{-0.035}	130 ^{+0.040} ₀	0.050-0.165	100、120、150
CRB-130140-L	130 ^{+0.340} _{+0.215}	140 ^{+0.165} _{+0.090}	130 ⁰ _{-0.040}	140 ^{+0.040} ₀	0.050-0.165	100、120、150
CRB-140150-L	140 ^{+0.340} _{+0.215}	150 ^{+0.165} _{+0.090}	140 ⁰ _{-0.040}	150 ^{+0.040} ₀	0.050-0.165	100、150、180
CRB-150160-L	150 ^{+0.340} _{+0.215}	160 ^{+0.165} _{+0.090}	150 ⁰ _{-0.040}	160 ^{+0.040} ₀	0.050-0.165	120、150、180



Material properties

High-performance wear-resistant materials serve as sliding layers combined with high-strength fiber-reinforced load-bearing layers; DURARUB® materials are suitable for applications with consistently high static and dynamic loads, relatively low sliding speeds, and they are also suitable for applications where conventional lubrication is not possible or prohibited. DURARUB® materials enable maintenance-free operation of machinery and equipment for customers.

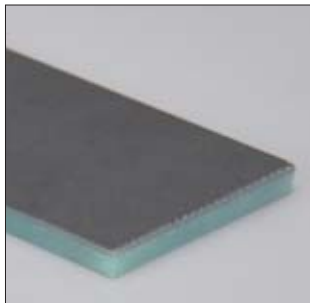
Technical data table

Material properties	Standard	Unit	DR11	DR12	DR21	DR22	DR30	DR33	DR50
Density	ISO1183	g/cm ³	1.90	1.90	1.90	1.90	1.30	1.90	1.56
Max. water absorption	ISO62	%	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Max. PV (dry)	ITS026	N/mm ² ×m/s	1.2	1.2	0.7	0.7	1.2	1.2	1.5
Coefficient of friction	ITS025	μ	0.05~0.20	0.05~0.15	0.10~0.25	0.10~0.25	0.05~0.20	0.05~0.20	0.10~0.25
Long-term application temperature	ITS029	°C	+120	+120	+120	+120	+160	+120	+250
Short-term application temperature	ITS029	°C	+160	+160	+160	+160	+200	+160	+310
Lowest application temperature	ITS029	°C	-60	-60	-60	-60	-60	-60	-100
Max. Speed	ITS032	m/s	0.15	0.15	0.50	0.50	0.15	0.15	1.0
Compressive strength	ITS033	MPa	200	200	200	200	150	200	550
Max. static load	ITS027	MPa	150	150	20	20	150	150	550
Max. dynamic load	ITS028	MPa	75	75	10	10	75	100	225
Coefficient of thermal expansion	ISO11359	10 ⁻⁶ ×K ⁻¹	13	13	13	13	50	13	15
Mating part hardness	-	HB	≥180	≥180	≥120	≥120	≥180	≥180	≥480
Mating part surface finish	-	Ra	0.2~0.8	0.2~0.8	0.2~0.8	0.2~0.8	0.2~0.8	0.2~0.8	0.2~0.8

*ITS: CSB company's internal test standards.

**Test temperatures are 23°C unless otherwise stated.

DURARUB®11 Sliding plates



■ Material structure

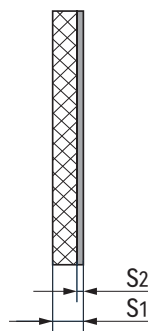
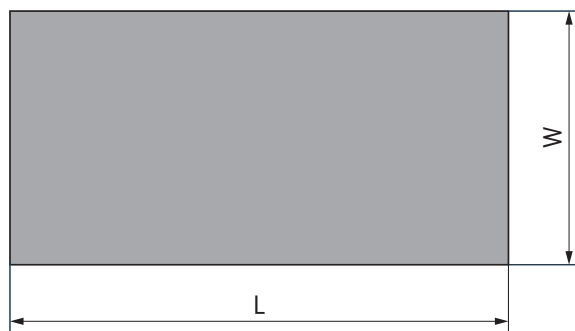
DR11 sliding plates consist of two layers combining the excellent bearing properties of low-friction sliding layer with the high strength of a load carrying glass-fibre filled backing.

The silding layer consists of an epoxy resin filled with solid lubricants and high performance weaves, designed to ensure good tribological properties.

Typical features

- For dry applications
- High load capability
- Low friction coefficient
- good chemical resistance
- Continuous working temperature 120°C

Standard specifications



Part No.:

DR11-050-0000-0000

L Length
W Width
T Thickness
Material

Part No.	$S_1 \pm 0.15$ ① [mm]	S_2 [mm]	W max. [mm]	L max. [mm]
DR11-020-0500-0600	2.0	1.0	500	600
DR11-030-0500-0600	3.0	1.0	500	600
DR11-040-0500-0600	4.0	1.0	500	600
DR11-050-0500-0600	5.0	1.0	500	600
DR11-060-0500-0600	6.0	1.0	500	600
DR11-080-0500-0600	8.0	2.0	500	600
DR11-100-0500-0600	10	2.0	500	600
DR11-120-0500-0600	12	2.0	500	600
DR11-150-0500-0600	15	3.0	500	600
DR11-200-0500-0600	20	5.0	500	600

① More thicknesses available upon request.

DURARUB®12 Sliding washers



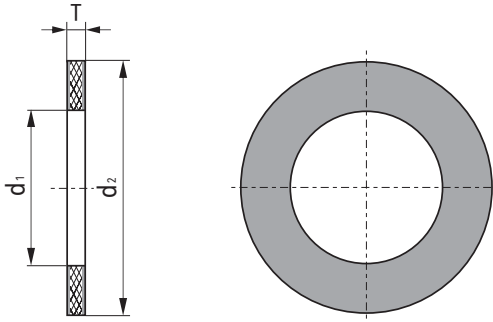
Material structure

DR12 sliding washers consist of three layers combining the excellent bearing properties of low-friction sliding layer with the high strength of a load carrying glass-fibre filled core layer. The core layer consists of an epoxy resin filled with high performance weaves, designed to ensure good tribological properties.

Typical features

- For dry applications
- High load capability
- Low friction coefficient
- good chemical resistance
- Continuous working temperature 120°C

Standard specifications



Part No.:

DR12W-1020-015

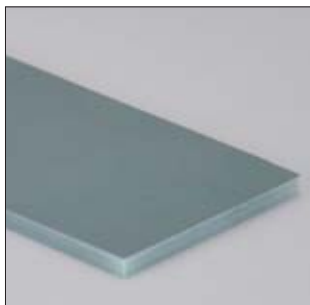
T Thickness
d₂ Outer diameter
d₁ Inner diameter
Material

Part No.	T±0.15 [mm]	d ₁ ^{+0.25} [mm]	d ₂ ^{-0.25} [mm]
DR12W-1020-015	1.5-3.0	10	20
DR12W-1224-015	1.5-3.0	12	24
DR12W-1426-015	1.5-3.0	14	26
DR12W-1530-015	1.5-3.0	15	30
DR12W-1630-015	1.5-3.0	16	30
DR12W-1832-015	1.5-3.0	18	32
DR12W-2036-015	1.5-3.0	20	36
DR12W-2238-015	1.5-3.0	22	38
DR12W-2442-015	1.5-3.0	24	42
DR12W-2546-015	1.5-3.0	25	46
DR12W-2640-015	1.5-3.0	26	40
DR12W-2644-015	1.5-3.0	26	44
DR12W-2848-015	1.5-3.0	28	48

Part No.	T±0.15 [mm]	d ₁ ^{+0.25} [mm]	d ₂ ^{-0.25} [mm]
DR12W-3050-015	1.5-3.0	30	50
DR12W-3254-015	1.5-3.0	32	54
DR12W-3560-015	1.5-3.0	35	60
DR12W-3862-015	1.5-3.0	38	62
DR12W-4065-015	1.5-3.0	40	65
DR12W-4266-015	1.5-3.0	42	66
DR12W-4570-015	1.5-3.0	45	70
DR12W-4874-015	1.5-3.0	48	74
DR12W-5075-015	1.5-3.0	50	75
DR12W-5278-015	1.5-3.0	52	78
DR12W-5685-015	1.5-3.0	56	85
DR12W-6085-015	1.5-3.0	60	85
DR12W-6290-015	1.5-3.0	62	90

*More dimensions available upon request.

DURARUB®21 Sliding plates



■ Material structure

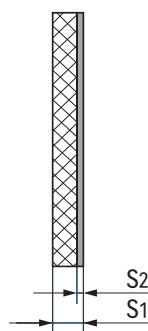
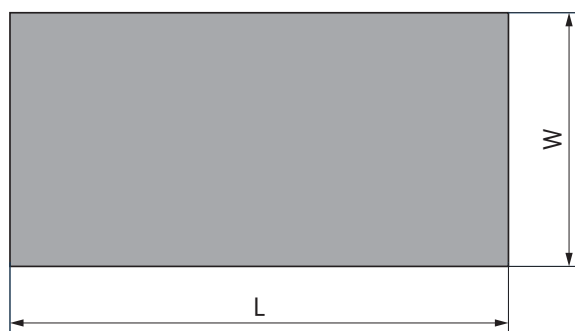
DR21 sliding plates consist of two layers combining the excellent bearing properties of low-friction sliding layer with the high strength of a load carrying glass-fibre filled backing.

The sliding layer consists of a fluoroplastic filled with solid lubricants, designed to ensure good tribological properties and lower starting friction force.

Typical features

- For dry applications
- Available hardened surface aluminum shafts
- Low starting friction force
- good chemical resistance
- Continuous working temperature 120°C

Standard specifications



Part No.:

DR21-050-0000-0000

L Length
W Width
T Thickness
Material

Part No.	$S_1 \pm 0.15$ ^① [mm]	S_2 [mm]	W max. [mm]	L max. [mm]
DR21-020-0300-0600	2.0	0.5	300	600
DR21-030-0300-0600	3.0	0.5	300	600
DR21-040-0300-0600	4.0	0.5	300	600
DR21-050-0300-0600	5.0	0.5	300	600
DR21-060-0300-0600	6.0	0.5	300	600
DR21-080-0300-0600	8.0	0.5	300	600
DR21-100-0300-0600	10	0.5	300	600
DR21-120-0300-0600	12	0.5	300	600
DR21-150-0300-0600	15	0.5	300	600
DR21-200-0300-0600	20	0.5	300	600

① More thicknesses available upon request.

DURARUB®22 Sliding washers



Material structure

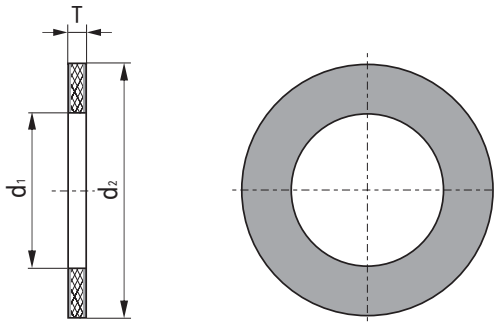
DR22 sliding washers consist of three layers combining the excellent bearing properties of low-friction sliding layer with the high strength of a load carrying glass-fibre filled core layer.

The sliding layer consists of a fluoroplastic filled with solid lubricants, designed to ensure good tribological properties and lower starting friction force.

Typical features

- For dry applications
- Available hardened surface aluminum shafts
- Low starting friction force
- good chemical resistance
- Continuous working temperature 120°C

Standard specifications



Part No.:

DR22W-1020-015

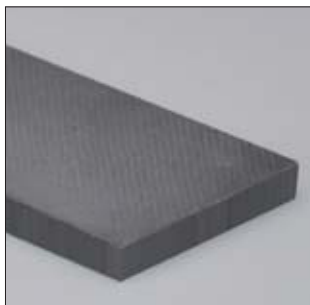
T Thickness
d₂ Outer diameter
d₁ Inner diameter
Material

Part No.	T±0.15 [mm]	d ₁ ^{+0.25} [mm]	d ₂ ^{-0.25} [mm]
DR22W-1020-015	1.5-3.0	10	20
DR22W-1224-015	1.5-3.0	12	24
DR22W-1426-015	1.5-3.0	14	26
DR22W-1530-015	1.5-3.0	15	30
DR22W-1630-015	1.5-3.0	16	30
DR22W-1832-015	1.5-3.0	18	32
DR22W-2036-015	1.5-3.0	20	36
DR22W-2238-015	1.5-3.0	22	38
DR22W-2442-015	1.5-3.0	24	42
DR22W-2546-015	1.5-3.0	25	46
DR22W-2640-015	1.5-3.0	26	40
DR22W-2644-015	1.5-3.0	26	44
DR22W-2848-015	1.5-3.0	28	48

Part No.	T±0.15 [mm]	d ₁ ^{+0.25} [mm]	d ₂ ^{-0.25} [mm]
DR22W-3050-015	1.5-3.0	30	50
DR22W-3254-015	1.5-3.0	32	54
DR22W-3560-015	1.5-3.0	35	60
DR22W-3862-015	1.5-3.0	38	62
DR22W-4065-015	1.5-3.0	40	65
DR22W-4266-015	1.5-3.0	42	66
DR22W-4570-015	1.5-3.0	45	70
DR22W-4874-015	1.5-3.0	48	74
DR22W-5075-015	1.5-3.0	50	75
DR22W-5278-015	1.5-3.0	52	78
DR22W-5685-015	1.5-3.0	56	85
DR22W-6085-015	1.5-3.0	60	85
DR22W-6290-015	1.5-3.0	62	90

*More dimensions available upon request.

DURARUB®30 Sliding plates



■ Material structure

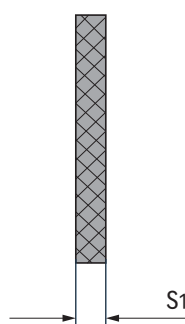
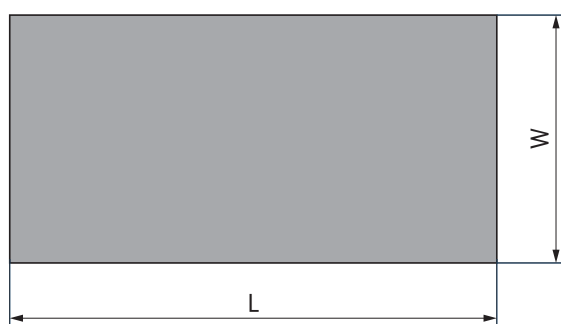
DR30 sliding plates only consist of one layer, combining the excellent bearing properties of low-friction sliding layer with the low-friction coefficient materials.

The sliding layer is composed of high-strength fibers, solid lubricants, and an epoxy resin matrix, designed to ensure the pad's outstanding friction characteristics.

Typical features

- For dry applications
- Excellent dimensional stability
- Low friction coefficient
- Good chemical resistance
- Continuous working temperature 160°C

Standard specifications



Part No.:

DR30-010-0000-0000

L Length

W Width

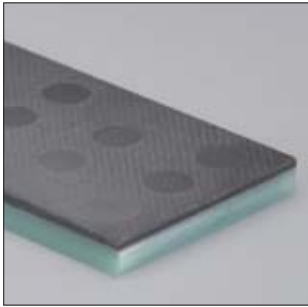
T Thickness

Material

Part No.	$S_1 \pm 0.15$ ^① [mm]	W max. [mm]	L max. [mm]
DR30-010-0500-0600	1.0	500	600
DR30-020-0500-0600	2.0	500	600
DR30-030-0500-0600	3.0	500	600
DR30-040-0500-0600	4.0	500	600
DR30-050-0500-0600	5.0	500	600
DR30-060-0500-0600	6.0	500	600
DR30-080-0500-0600	8.0	500	600
DR30-100-0500-0600	10	500	600
DR30-120-0500-0600	12	500	600
DR30-150-0500-0600	15	500	600
DR30-200-0500-0600	20	500	600

① More thicknesses available upon request.

DURARUB®33 Sliding plates



■ Material structure

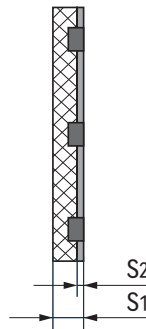
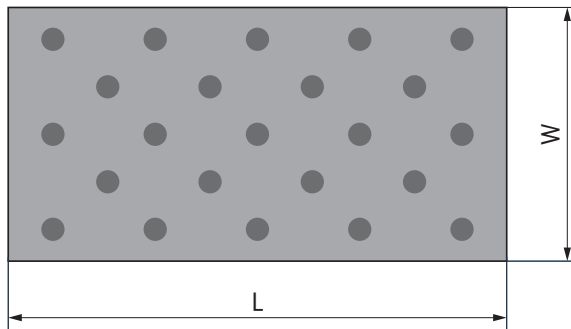
DR33 sliding plates consist of two layers combining the excellent bearing properties of low-friction sliding layer with the high strength of a load carrying glass-fibre filled backing.

The sliding layer consists of an epoxy resin filled with high strength solid lubricant columns and high performance weaves, designed to ensure high load and good tribological properties.

Typical features

- For dry and underwater applications
- Fluorine and silicon free
- Excellent dimensional stability
- High load capability
- Low friction coefficient
- Good chemical resistance
- Sliding layer machined available
- Continuous working temperature 120°C

Standard specifications



Part No.:

DR33-050-0000-0000

L Length

W Width

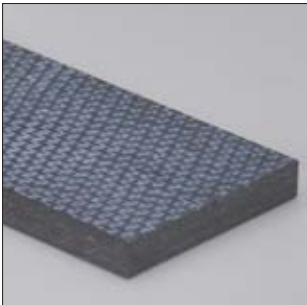
T Thickness

Material

Part No.	$S_1 \pm 0.15$ ① [mm]	S_2 [mm]	W max. [mm]	L max. [mm]
DR33-050-0500-0600	5.0	1.0	500	600
DR33-060-0500-0600	6.0	1.0	500	600
DR33-080-0500-0600	8.0	2.0	500	600
DR33-100-0500-0600	10	2.0	500	600
DR33-120-0500-0600	12	2.0	500	600
DR33-150-0500-0600	15	3.0	500	600
DR33-200-0500-0600	20	5.0	500	600

① More thicknesses available upon request.

DURARUB®50 Sliding plates



■ Material structure

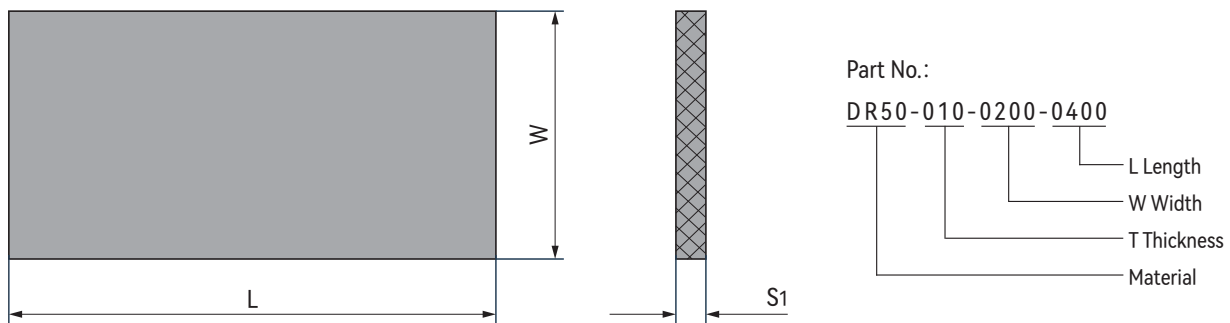
DR50 sliding plates consists only of a sliding layer, combining the excellent load performance and high strength of a low-friction sliding layer.

The sliding layer consists of a special carbon fiber fabric filled with PEEK resin, designed to ensure good mechanical and tribological properties.

Typical features

- For dry, oil, grease or underwater applications
- Fluorine and silicon free
- Excellent dimensional stability
- High load capability
- Good chemical resistance
- Sliding layer machined available
- Continuous working temperature 250°C

Standard specifications



Part No.	$S_1 \pm 0.15$ [mm]	W max. [mm]	L max. [mm]
DR50-010-0200-0400	1.0	200	400
DR50-015-0200-0400	1.5	200	400
DR50-020-0200-0400	2.0	200	400
DR50-025-0200-0400	2.5	200	400
DR50-030-0200-0400	3.0	200	400
DR50-050-0600-1000	5.0	600	1000
DR50-060-0600-1000	6.0	600	1000

Part No.	$S_1 \pm 0.15$ [mm]	W max. [mm]	L max. [mm]
DR50-080-0600-1000	8.0	600	1000
DR50-100-0600-1000	10.0	600	1000
DR50-120-0600-1000	12.0	600	1000
DR50-150-0600-1000	15.0	600	1000
DR50-200-0600-1000	20.0	600	1000
DR50-250-0600-1000	25.0	600	1000
DR50-300-0600-1000	30.0	600	1000

*All dimensions and tolerances upon request.

DURARUB® Chemical resistance table

Chem	CRM	CRB	CRG	CRH	CRP	CRW	CRF	DR11	DR12	DR21	DR22	DR30	DR33	DR50
Acetic 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Arsenic 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boric 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Carbonic 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Citric 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hydrochloric 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hydro-fluoric 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Nitric 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sulfuric 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Aluminum 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Calcium 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Magnesium 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Potassium Hydroxide 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sodium Hydroxide 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Aluminum Chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Aluminum Nitrate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Aluminum Sulfate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Calcium Chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ferric Chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Magnesium Carbonate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Magnesium Chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Magnesium Sulfate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sodium Acetate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sodium Bicarbonate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sodium Bisulfate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sodium Chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sodium Nitrate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Zinc Sulfate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Acetol	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Allyl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Butyl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ethyl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Iso Butyl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Iso Propyl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Methyl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Propyl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Acetone	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Benzene	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Carbon Tetrachloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Methylene Chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Methyl Ethyl Ketone	●	●	●	●	●	●	●	●	●	●	●	●	●	●

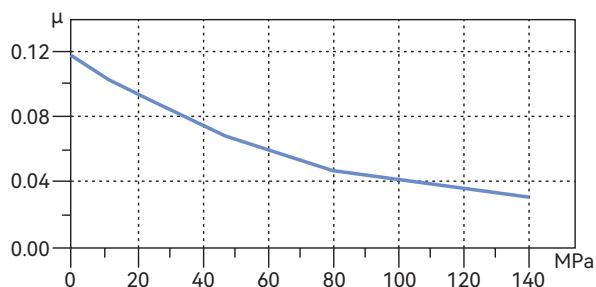
DURARUB® Chemical resistance table

Chem	CRM	CRB	CRG	CRH	CRP	CRW	CRF	DR11	DR12	DR21	DR22	DR30	DR33	DR50
Naphtha	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Toluol	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Trichlorethane	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cottonseed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Crude Oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hydraulic Fluids	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Linseed Oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Motor Oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Transmission Fluids	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Diesel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gasoline	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Jet Fuel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Kerosene	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Acetylene Bromine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Butane	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Carbon Dioxide	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Chlorine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ethers	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Fluorine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hydrogen	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Natural Gas	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Nitrogen	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ozone	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Propane	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sulfur Dioxide	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Anhydrous Ammonia	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Detergents	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ethylene Glycol	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Formaldehyde	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Freon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hydrogen Peroxide	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Lime	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Water	●	●	●	●	●	●	●	●	●	●	●	●	●	●

● Resistant
● Not Resistant

Friction coefficient

Friction Coefficient of filament Bearing is 0.03 ~ 0.12. The main factors affect the Friction Coefficient are Load, Moving method, Speed and Roughness of mating surfaces. Graph 1 shows the friction coefficient is going down while load is increasing under the rotation method.



Graph 1: Load vs Friction Coefficient

Specification: CRB-6070-50

Shaft: 45# HRC50, Ra=0.4

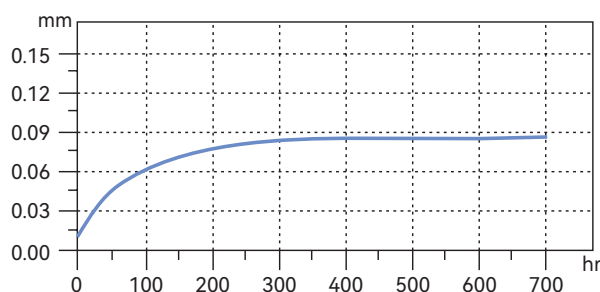
Load: 20~140MPa

Speed: 1.0m/min

Lubricate: Dry

The anti-wear property

The main factors affect the anti-wear property are the load, moving method, speed and roughness of mating surfaces. Graph 2 shows the bearing wear off under room temperature with the load of 50MPa when the bearing is swinging. It is found the wear off increases sharply during the initial running-in while the lubricant is transferred from the inner liner and a smooth surface is created there of to form the lubricating surface. After running-in period, it will maintain stable without wear off.



Graph 2: Duration vs Wear off amount

Specification: CRB-4050-30

Shaft: 45# HRC50, Ra=0.4

Load: 50MPa

Speed: 1.0m/min, ±45°

Lubrication: Dry

Operating temperature and load capacity

Operating temperature is an important consideration when specifying bearing products since temperature will have a direct affect on bearing load capacity and wear resistance.

At elevated temperatures DURARUB® bearings have reduced load carrying capabilities due to the softening of the self-lubricating surfaces, particularly in CRP, DR21, DR22, and DR50.

However, these bearings suitable for low-temperature applications.

The standard maximum static and dynamic loads for DURARUB® bearings are determined based on bearings with the 5.0mm wall thickness. Thin-walled bearings, especially those with wall thicknesses below 2.5mm, exhibit reduced load capacity because of the reduced number of fiber reinforced composite fiber crossovers that constitute the backing material

Dimension design

■ Wall thickness

Thin walls reduce load capacity (approximately 50% lower than the rated load capacity of DURARUB® filament-wound bearings). Therefore, avoid selecting bearings with a wall thickness less than 2.5 mm.

The recommended minimum wall thickness is 1.5mm. For bearings with wall thicknesses greater than 5.0mm, the increase in load capacity become relatively small.

■ Length

During bearing design, shaft diameter is typically determined by structural stability or stiffness. Therefore, bearing length must be determined based on working pressure and required service life.

Short bearings should be limited to a minimum length-to-shaft diameter ratio of 0.25 to ensure secure fixation within the housing bore.

Long bearings are not recommended due to potential shaft deflection and eccentricity issues. Under heavy loads, long bearings may generate uneven high unit loads at both ends due to shaft deflection. Therefore, the length-to-shaft diameter ratio should not exceed 2.0.

Operating clearance

Proper running clearance is critical to ensure bearing performance. In low-speed oscillating pivot applications, the recommended minimum possible clearance for filament-wound bearings is 0.013mm. During assembly, the shaft or pin is nearly close to a line fit. Since low-speed oscillating operations generate little or no heat, no additional clearance is required.

For more dynamic applications involving continuous rotation at high speeds or in high ambient temperatures, the minimum clearance may be 0.005 mm/mm of the unit diameter.

CRB、CRG and CRH bearings cannot be machined in the inner diameter due to limitations in the sliding layer composition. However, CRP、CRM and CRF bearings can be machined to achieve tighter tolerance bands.

Standard CRP bearings feature a 0.40mm thick sliding layer made of specially modified PTFE tape. If necessary, the inner bore can be machined during assembly.

CRP bearings can also be produced with thicker sliding layers to allow for greater machining depths. For more information, contact CSB.

Lubrication

DURARUB® filament-wound bearings are recommended for dry friction environments. However, grease can be used to protect and/or clean corroded or contaminated bearing areas. After prolonged high-cycle vibration, the sliding layer fibers may suffer from hydrostatic erosion caused by grease. Monitoring is required to ensure the integrity of the sliding layer throughout the equipment's service life.

CRP bearings can be immersed in lubricating oil or other liquid lubricants to reduce the coefficient of friction and bearing wear. However, lubricants must be regularly maintained to prevent contamination. The use of grease is not recommended for CRP bearings.

CRW and CRF bearings are specifically designed for hydropower applications and can be used both on land and underwater. It is advised to use hardened stainless steel shafts (e.g., 440 stainless steel) to minimize shaft corrosion.

Shaft materials and surface roughness

As part of the entire assembly, proper shaft design is critical to achieving satisfactory bearing performance. Most alloy steels can be used as shaft materials. In high-load applications or situations requiring protection of mating surfaces due to external contaminants, quenched steel shafts can exhibit excellent performance.

When bearing working pressure exceeds approximately 14 N/mm^2 , the minimum shaft hardness should be at least 480 HB [50 HRC]. Through-hardened shafts are generally not required.

CSB filament-wound bearings can effectively embed contaminants, but we strongly recommend using seals. For corrosion resistance, hardened stainless steel or hard chrome-plated materials are recommended.

Equally important to material selection is shaft surface roughness. A roughness value between Ra0.2-Ra0.6 provides optimal bearing performance by improving wear resistance and reducing the coefficient of friction. Rougher surfaces can be used but will shorten bearing service life, as rough shaft surfaces wear down the relatively soft sliding layer of the bearing.

We recommend chamfering or rounding shaft ends to facilitate assembly and minimize the risk of scoring the bearing.

Shaft materials and surface roughness

The operating clearance for standard DURARUB® filament-wound bearings is based on installations with steel or cast iron housings at normal ambient temperatures. If non-ferrous alloy housings (e.g., aluminum) are used, poor bearing retention may occur due to thermal expansion of the housing.

In high-temperature environments with non-ferrous alloy housings, the interference fit between the bearing and housing bore must be increased to ensure proper fixation of the bearing within the housing. To prevent shaft interference during assembly, the shaft diameter should be reduced accordingly to compensate for the additional assembly interference. For more information, please contact CSB.

Eccentricity

Figure A shows a bearing with a uniform load distributed along its length, where the shaft is well-aligned. The right side of Figure A displays a top view of the contact area. Figure B demonstrates that shaft eccentricity reduces the contact area and shifts the bearing load toward one end. Severe eccentricity causes the contact area to assume a parabolic shape, as illustrated in Figure C. Significant misalignment-induced concentrated edge pressure can lead to bearing failure. If the edge pressure approaches or exceeds the material's compressive strength, fractures or structural breaks may occur.

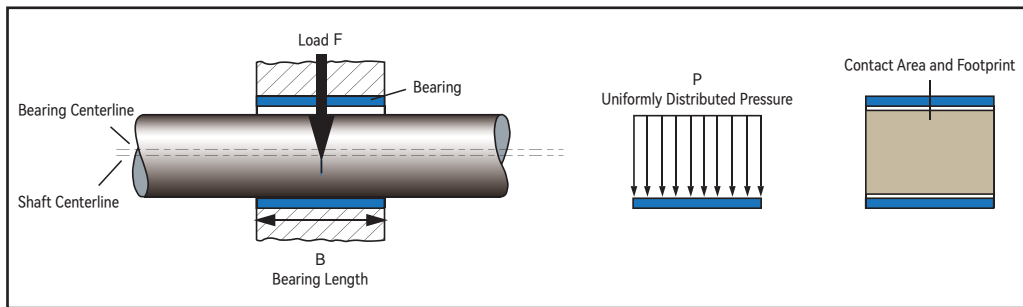


Figure A: No Deviation

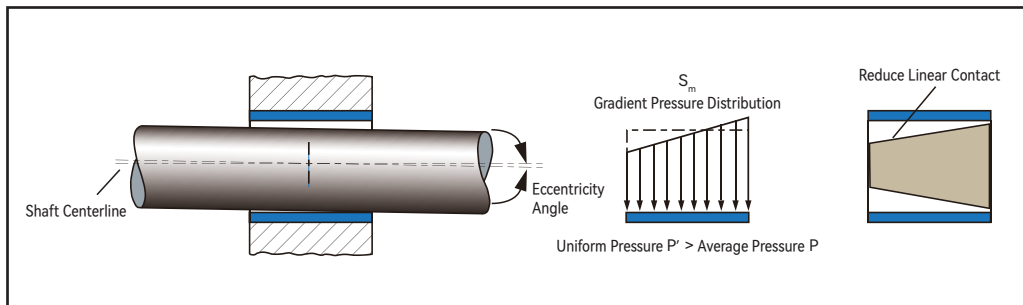


Figure B: Minor Deviation

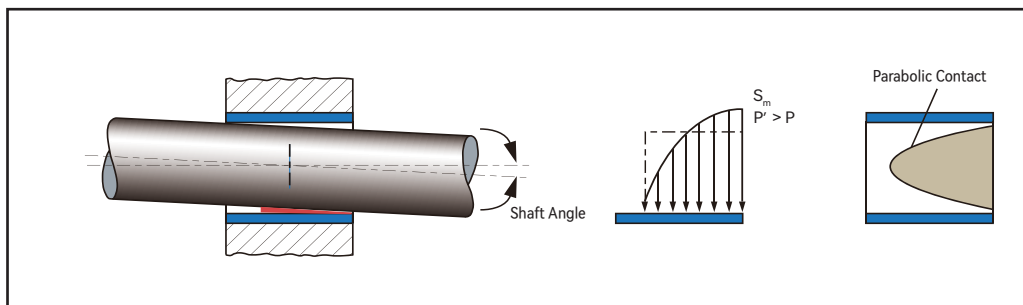
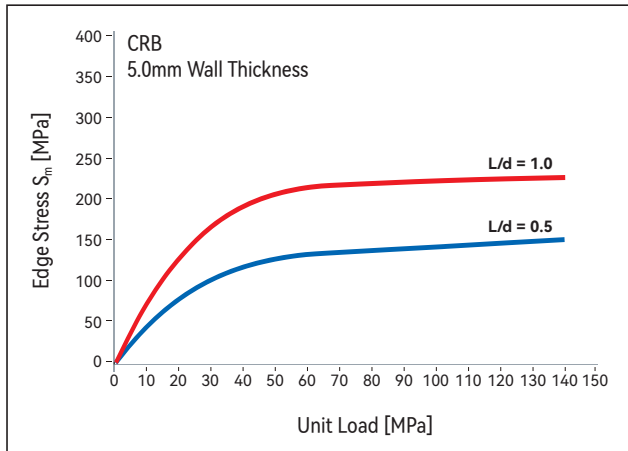


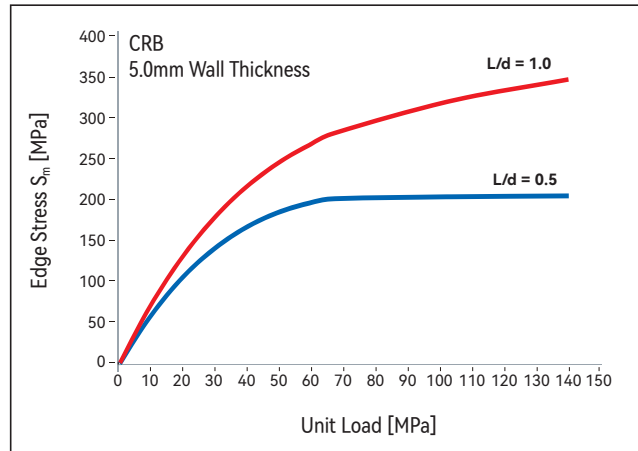
Figure C: Severe Deviation

Based on empirical knowledge, in high-load, ultra-low-speed applications, if eccentricity and/or shaft deflection is minimal—below 0.2% (eccentricity per unit shaft length: 0.002 mm/mm)—the eccentricity issue can be considered negligible.

For static loads or static loads with impact loads present, if the edge stress exceeds the allowable maximum static load of DURARAB®, the bearing must be redesigned. It is specifically noted that CRP bearings, DR21 sliding plates, and DR22 thrust washers are not recommended for applications where severe eccentricity is anticipated.



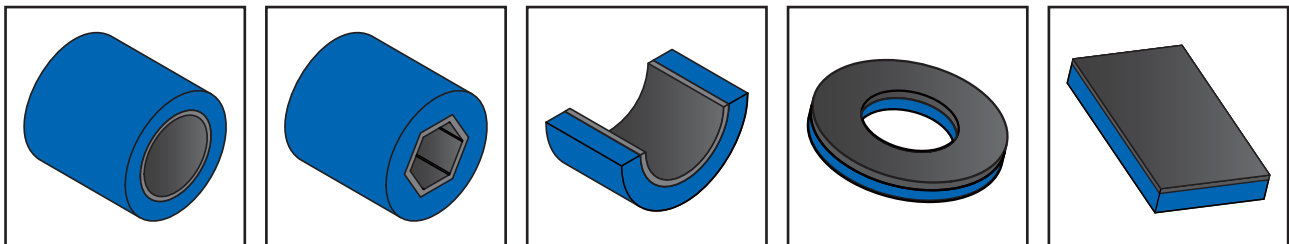
Edge Stress 0.6%



Edge Stress 1.0%

Sizes and Shapes

- Cylindrical bearings: linner diameter 20–500mm, Max. length 800mm
- Thrust washers: Thickness 1.5–20mm, Max. outer diameter 500mm
- Sliding pads: Thickness 1.5–20mm, Max. length 600mm

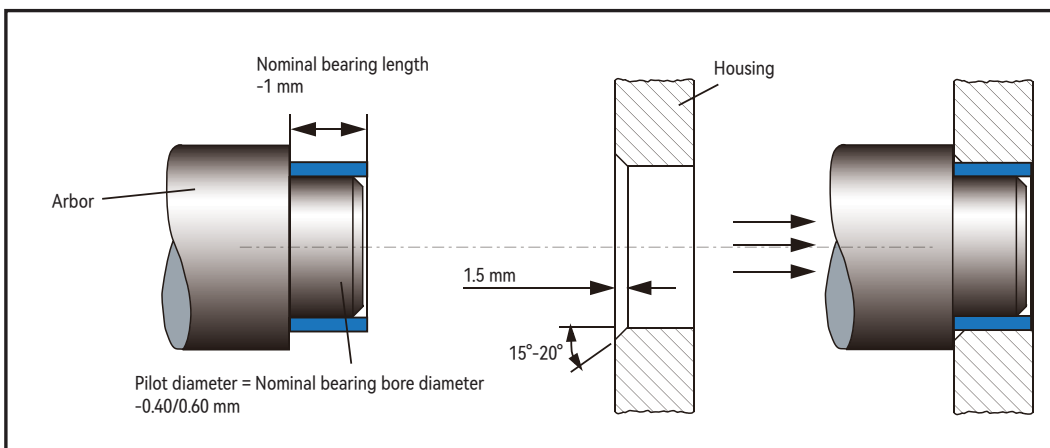


Installation and Machining

■ Installation

DURARUB® filament-wound bearings installed in metal housings achieve excellent dimensional stability due to the material's high rigidity and thermal expansion coefficient similar to that of steel.

During installation, a specific interference fit exists between the bearing and the housing bore. Interference fit requirements must be considered when calculating both bearing installation dimensions and mating shaft dimensions.



Bearing Installation

■ DURARUB® can be installed into the bearing housing bore using helical press-in equipment, hydraulic press-in equipment, or mandrel press-in devices. However, hammering the bearing during installation is strictly prohibited.

■ The standard tolerance for bearing housings is H7.

■ The surface roughness of the housing bore should be $R_a = 3.2 \mu\text{m}$.

■ A 20-40° chamfer should be provided on the housing bore to facilitate assembly.

■ DURARUB® bearings with an inner diameter exceeding 150 mm, cryogenic installation using liquid nitrogen is applicable.

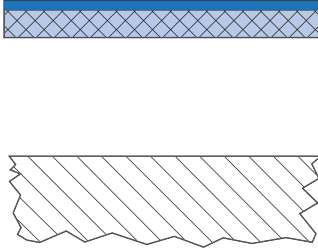
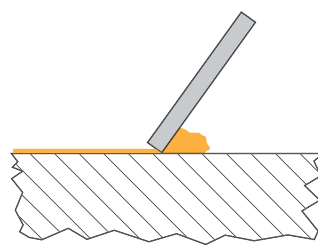
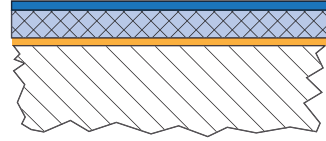
Machining

The DURARUB® bearing sliding layer is compatible with machining using standard single-point cutting tools. For standard CRM bearings, the maximum allowable machining depth is 0.5mm, while CRP bearings also permit a maximum machining depth of 0.2mm, extendable to 1.0mm under special requirements. Machining must be performed without coolant.

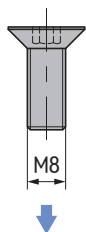
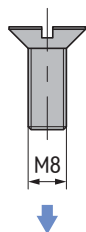
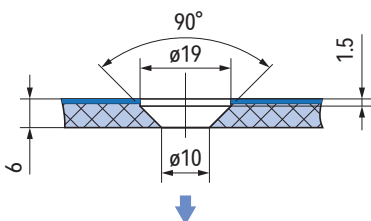
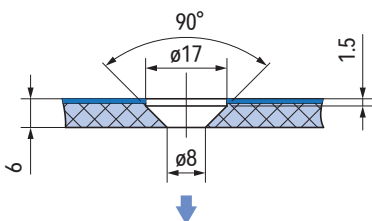
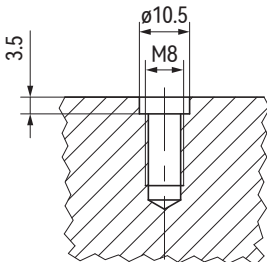
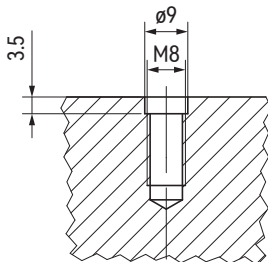
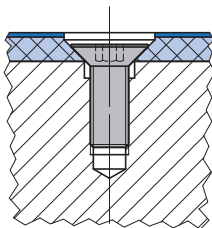
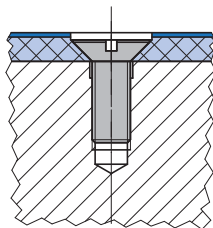
Carbide tools with a nose radius of 3-10mm are recommended, operating at a cutting speed of 1.25-3.5m/s and a transverse feed rate of 0.13mm per revolution for machining the sliding layer.

When drilling DURARUB® bearings, carbide flat head drills or flat end mills must be used, and the inner diameter should be supported with a mandrel to prevent tearing of the wear-resistant layer.

Sliding plates installation using adhesive

Preparation: Roughen the surface to increase roughness for better adhesion (e.g., using 120-grit sandpaper). Thoroughly clean the surface.	Adhesive Application: Apply the adhesive using a notched trowel. Notch size: 0.5-1 mm.	Assembly: Press the sliding plate surface and the assembly base surface together with light pressure and allow the adhesive to cure.
1 	2 	3 
Recommended adhesives Loctite 496 / 3425 (follow the manufacturer's guidelines)		

Installation with M8 countersunk screws

Countersunk socket screw M8 (according to EN ISO 10642) also valid for torx screw		Slotted countersunk screw M8 (according to ISO 2009)	
A1		B1	
DURARUB® Sliding plates		DURARUB® Sliding plates	
A2		B2	
Base material		Base material	
A3		B3	
DURARUB® sliding plates after installation		DURARUB® sliding plates after installation	
A4		B4	
Mounting During mounting, secure the screws with metal adhesive "Loctite 243" for intermediate strength or Loctite 278" for high-strengthbolting. The operating temperature limits and manufacturer's details must be observed.			

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