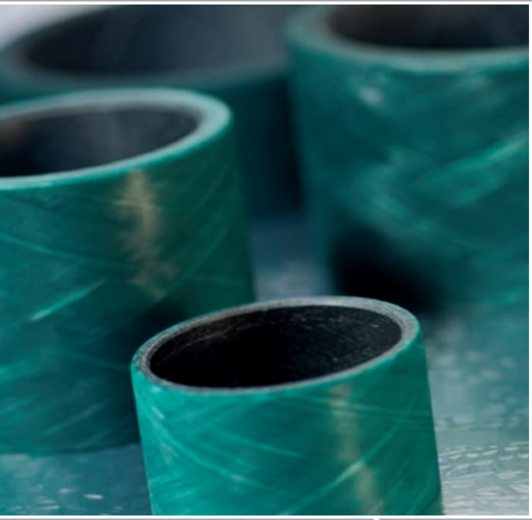
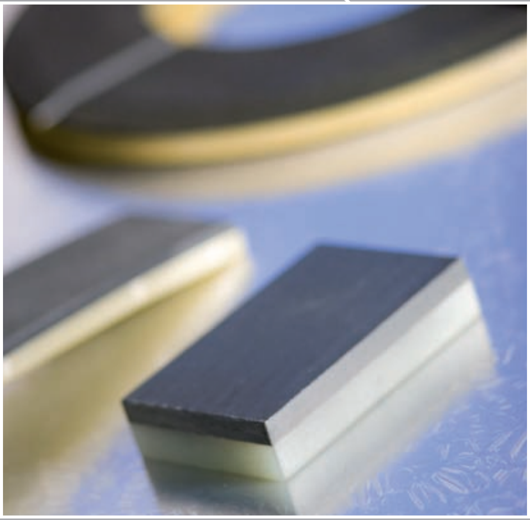
FEDERAL-MOGUL
POWERTRAIN

World Class Bearing Technology





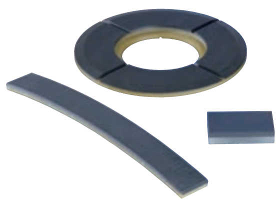
deva.tex® sliding bearings
Maintenance-free, self-lubricating

FEDERAL-MOGUL POWERTRAIN

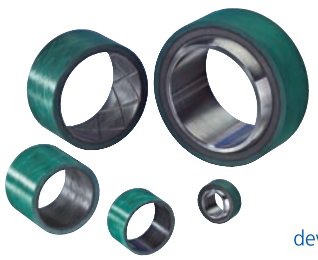
deva.tex®

deva.tex® 532

deva.tex® 541



deva.tex® 542



deva.tex® 552

High performance material – PTFE sliding layer on glass-fibre reinforced carrying layer

Contemporary designs represent an enormous challenge for modern-day bearing materials. Zero maintenance is often expected under severe to extreme conditions as well as under maximum loads.

The constant pressure on costs also calls for increasing uptime of machinery and equipment and uncompromising standards of operational reliability.

deva.tex materials are suitable for applications involving sustained high static and dynamic loads, relatively low sliding speeds and rotary, angular, axial or linear motion. They are also suitable for applications where conventional lubrication is not possible or permissible, or where other properties are required such as durability and resistance to operational and environmental influences or special conditions (e.g. impact load, abrasive stress, etc).

Our bearing service

- Profit from more than 60 years of experience in self-lubricating sliding bearings.
- Make use of our extensive material and application expertise spanning a very wide range of industries.
- Let our application engineering team assist you in the:
  - selection of the bearing materials,
  - design, purpose-built to your requirements,
  - assembly and installation,
  - calculation of estimated life time.
- Benefit from the latest material developments, tested using state of the art facilities.
- Ask for a simulation of your bearing application on our test rigs.
- Expect the highest quality standards, certified to DIN ISO 9001:2008, ISO/TS 16949:2009 and DIN EN ISO 14001:2004.

Content

1

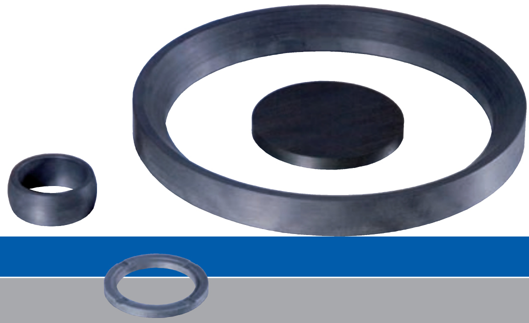
Materials

deva.tex® 532

Base: Solid lubricants-filled epoxy resin sliding layer and glass-fibre filled backing

deva.tex 532 sliding plates consist of two layers combining the excellent bearing properties of a 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 solid lubricants, designed to ensure good tribological properties. **deva.tex 532** sliding plates have extremely good friction properties.

deva.tex® 541



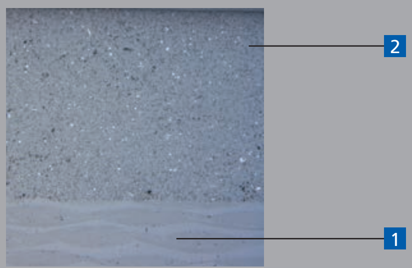
Solid lubricants-filled epoxy resin sliding monolayer

deva.tex 541 sliding plates consist of only sliding layer combining the excellent bearing properties of a low-friction surface. The sliding layer containing a special type of fibres in an epoxy resin matrix with structurally embedded solid lubricants, designed to ensure excellent tribological properties.

2

Material structure

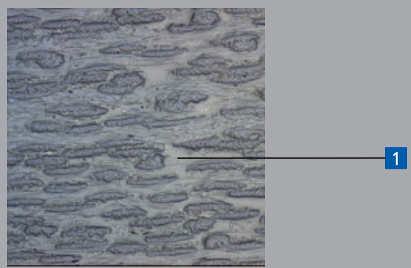
Microsection deva.tex 532



1 Carrying layer: continuous glass-fibre embedded in a high temperature epoxy resin matrix.

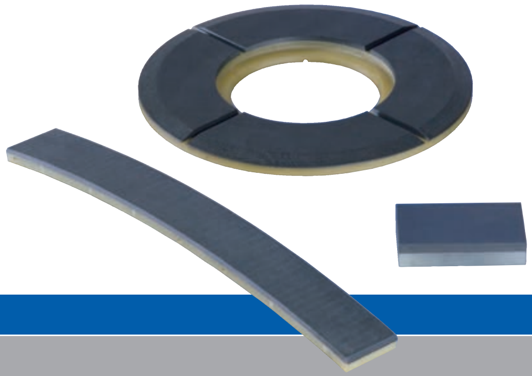
2 Sliding layer: a special type of epoxy resin matrix with structurally embedded solid lubricants.

Microsection deva.tex 541



1 Material contains a special type of epoxy resin matrix with structurally embedded solid lubricants

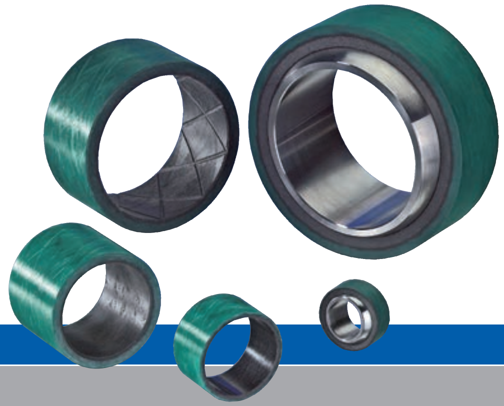
deva.tex® 542



Base: Solid lubricants-filled fibre reinforced epoxy resin sliding layer and glassfibre filled backing

deva.tex 542 sliding plates consist of two layers combining the excellent bearing properties of a low-friction sliding layer with the high strength of a load carrying glass-fibre filled backing. The fibre reinforced sliding layer consists of an epoxy resin filled with solid lubricants, designed to ensure good tribological properties. The outer layer is characterized by a glass-fibre reinforced epoxy resin matrix for optimum load capability.

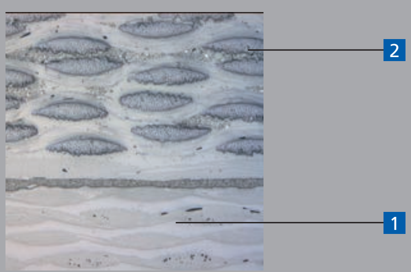
deva.tex® 552



Base: High temperature epoxy resin filament wound bearing

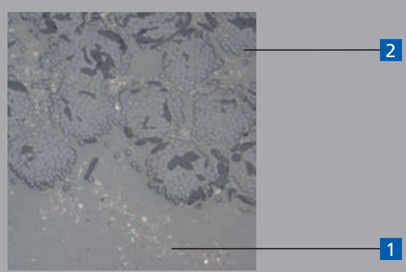
deva.tex 552 is a self-lubricating material consisting of two layers. The inner sliding layer is made of a special type of fibre containing lubricants. The fibres are embedded in an epoxy resin matrix with graphite as additional lubricant for high load capability, providing low wear rates in dry and wet conditions. The outer layer is characterised by a glass-fibre reinforced epoxy resin matrix with the high strength of an aligned glass fibre wound structure.

Microsection deva.tex 542



1. Carrying layer: continuous glass-fibre embedded in a high temperature epoxy resin matrix
2. Sliding layer: a special type of epoxy resin matrix with structurally embedded solid lubricants.

Microsection deva.tex 552



1. Wound glass-fibre embedded in a high temperature epoxy resin matrix
2. Sliding layer: High-strength, wound fibres with solid lubricant embedded in a high temperature epoxy resin matrix

FEDERAL-MOGUL POWERTRAIN

3

Material properties

3.1 Composition and properties

deva.tex 532	Physical and mechanical properties[1]					Bearing properties		
	Density	Linear coefficient of thermal expansion	Thermal conductivity factor	Compressive strength [2] sliding layer	Compressive strength [2] backing layer	Permissible load static	Permissible load dynamic	Sliding speed dry
Symbol	ρ	α_1	λ	σ_{max}		$\bar{p}_{stat/max}$	$\bar{p}_{dyn/max}$	U_{max}
Unit	g/cm³	10^{-6}/K	W/mK	MPa		MPa		m/s
Sliding plates	2.0	13	0.4	120	220	100	60	0.1

[1] Current properties and values can be found in the DEVA® material data sheets, which are available on request.
[2] Backing layer

deva.tex 541	Physical and mechanical properties[1]				Bearing properties		
	Density	Young's modulus	Tensile strength	Compressive strength	Permissible load static	Permissible load dynamic	Sliding speed dry
Symbol	ρ	E_{min} (DIN 53452)			$\bar{p}_{stat/max}$	$\bar{p}_{dyn/max}$	U_{max}
Unit	g/cm³	MPa	MPa	MPa	MPa		m/s
Sliding plates	1.8	ca. 2500	65	150	150	75	0.1

[1] Current properties and values can be found in the DEVA® material data sheets, which are available on request.
[2] Backing layer

deva.tex 542	Physical and mechanical properties[1]							Bearing properties		
	Density	Young's modulus sliding layer	Young's modulus backing layer	Tensile strength sliding layer	Tensile strength backing layer	Compressive strength sliding layer	Compressive strength backing layer	Permissible load static	Permissible load dynamic	Sliding speed dry
Symbol	ρ	E_{min} (DIN 53452)						$\bar{p}_{stat/max}$	$\bar{p}_{dyn/max}$	U_{max}
Unit	g/cm³	MPa		MPa		MPa		MPa		m/s
Sliding plates	2.0	4100	18000	65	200	150	220	150	75	0.1

[1] Current properties and values can be found in the DEVA® material data sheets, which are available on request.
[2] Backing layer

deva.tex 552	Physical and mechanical properties[1]				Bearing properties		
	Density	Linear coefficient of thermal expansion	Thermal conductivity factor	Radial crushing strength[2]	Permissible load static	Permissible load dynamic	Sliding speed dry
Symbol	ρ	α_1	λ	σ_{max}	$\bar{p}_{stat/max}$	$\bar{p}_{dyn/max}$	U_{max}
Unit	g/cm³	10^{-6}/K	W/mK	MPa	MPa		m/s
Cyl. bearings	2.0	13	0.3	415	230	140	0.20

[1] Current properties and values can be found in the DEVA® material data sheets, which are available on request.
[2] Backing layer

Bearing properties — deva.tex 532 — Table 3.1.1.A

p̄U value		Temperature range[3]		Friction coefficient [4]		Shaft hardness [5]	Shaft surface finish	
dry	static	min.	max.	dry	in water	min.	optimal	
$\bar{p}U_{max}$		T_{min}	T_{max}	f	f		R_a	*Symbol*
MPa × m/s		°C		μ		HB	μm	*Unit*
0.9	0.9	-40	75	0.03 - 0.15	0.05 - 0.16	180	0.4 - 1.0	**Sliding plates**

[3]Values do not apply in continuous operation.

[4]The stated sliding friction coefficients are not guaranteed properties. They have been determined on our test rigs using field-proven parameters that do not necessarily reflect the actual application of our products and their service environment. We offer customer-specific friction and wear tests on request.

[5]In the presence of abrasive contamination and temperatures above 100 °C a hardness of 220 HB is recommended

Bearing properties — deva.tex 541 — Table 3.1.1.B

p̄U value		Temperature range[3]		Friction coefficient [4]		Shaft hardness [5]	Shaft surface finish	
dry	in water	min.	max.	dry	in water	min.	optimal	
$\bar{p}U_{max}$		T_{min}	T_{max}	f	f		R_a	*Symbol*
MPa × m/s		°C		μ		HB	μm	*Unit*
1.2	0.9	-60	80	0.06 - 0.25	0.08 - 0.27	180	0.4 - 1.0	**Sliding plates**

[3]Values do not apply in continuous operation.

[4]The stated sliding friction coefficients are not guaranteed properties. They have been determined on our test rigs using field-proven parameters that do not necessarily reflect the actual application of our products and their service environment. We offer customer-specific friction and wear tests on request.

[5]In the presence of abrasive contamination and temperatures above 100 °C a hardness of 220 HB is recommended

Bearing properties — deva.tex 542 — Table 3.1.1.C

p̄U value		Temperature range[3]		Friction coefficient [4]		Shaft hardness [5]	Shaft surface finish	
dry	in water	min.	max.	dry	in water	min.	optimal	
$\bar{p}U_{max}$		T_{min}	T_{max}	f	f		R_a	*Symbol*
MPa × m/s		°C		μ		HB	μm	*Unit*
1.2	0.9	-60	80	0.06 - 0.25	0.08 - 0.27	180	0.4 - 1.0	**Sliding plates**

[3]Values do not apply in continuous operation.

[4]The stated sliding friction coefficients are not guaranteed properties. They have been determined on our test rigs using field-proven parameters that do not necessarily reflect the actual application of our products and their service environment. We offer customer-specific friction and wear tests on request.

[5]In the presence of abrasive contamination and temperatures above 100 °C a hardness of 220 HB is recommended

Bearing properties — deva.tex 552 — Table 3.1.1.D

p̄U value		Temperature range[3]		Friction coefficient [4]		Shaft hardness [5]	Shaft surface finish	
dry	in water	min.	max.	dry	in water	min.	optimal	
$\bar{p}U_{max}$		T_{min}	T_{max}	f	f		R_a	*Symbol*
MPa × m/s		°C		μ		HB	μm	*Unit*
1.5	1.5	-60	160	0.03 - 0.12	0.04 - 0.13	180	0.4 - 1.0	**Cyl. bearings**

[3]Values do not apply in continuous operation.

[4]The stated sliding friction coefficients are not guaranteed properties. They have been determined on our test rigs using field-proven parameters that do not necessarily reflect the actual application of our products and their service environment. We offer customer-specific friction and wear tests on request.

[5]In the presence of abrasive contamination and temperatures above 100 °C a hardness of 220 HB is recommended

3.2 Chemical resistance

deva.tex® sliding bearings are highly resistant to corrosive environments. Table 3.2.1 provides an overview of their possible applications in various media at room temperature. Their suitability for use with other media and chemicals should be checked in a resistance test according to DIN 50905 or ASTM D543.

Chemical resistance of deva.tex — Table 3.2.1

Medium	532	541	542	552
Alcohols				
Amyl alcohol	✓	✓	✓	✓
Ethyl alcohol	✓	✓	✓	✓
Ethylene glycol	✓	✓	✓	✓
Hydroxy acetone	✓	✓	✓	✓
Isobutyl alcohol	✓	✓	✓	✓
Isopropyl alcohol	✓	✓	✓	✓
Methyl alcohol	✓	✓	✓	✓
Propyl alcohol	✓	✓	✓	✓
Allyl alcohol	×	×	×	×
Butyl alcohol	×	×	×	×
Solvents				
Acetone	✓	✓	✓	✓
Methyl ethyl ketone	✓	✓	✓	✓
Naphtaline	✓	✓	✓	✓
Toluene	✓	✓	✓	✓
Benzene	×	×	×	×
Chloromethane	×	×	×	×
Trichloroethane	×	×	×	×
Fuels				
Petrol	✓	✓	✓	✓
Diesel fuel	✓	✓	✓	✓
Kerosene	✓	✓	✓	✓
Oils				
Cotton seed oil	✓	✓	✓	✓
Crude oil	✓	✓	✓	✓
Gear oil	✓	✓	✓	✓
Hydraulic oil	✓	✓	✓	✓
Linseed oil	✓	✓	✓	✓
Motor oil	✓	✓	✓	✓
Gases				
Acetylene	✓	✓	✓	✓
Ether	✓	✓	✓	✓
Butane	✓	✓	✓	✓
Natural gas	✓	✓	✓	✓
Carbon dioxide	✓	✓	✓	✓
Ozone	✓	✓	✓	✓
Propane	✓	✓	✓	✓
Sulphur dioxide	✓	✓	✓	✓
Nitrogen	✓	✓	✓	✓
Hydrogen	✓	✓	✓	✓
Bromine	×	×	×	×
Chlorine	×	×	×	×
Fluorine	×	×	×	×

Medium	532	541	542	552
Salts				
Ammonium chloride	✓	✓	✓	✓
Ammonuim nitrate	✓	✓	✓	✓
Ammonium sulphate	✓	✓	✓	✓
Iron chloride	✓	✓	✓	✓
Calcium chloride	✓	✓	✓	✓
Magnesium chloride	✓	✓	✓	✓
Magnesium carbon.	✓	✓	✓	✓
Magnesium sulphate	✓	✓	✓	✓
Sodium acetate	✓	✓	✓	✓
Sodium bisulphate	✓	✓	✓	✓
Sodium carbonate	✓	✓	✓	✓
Acids 10%				
Boric acid	✓	✓	✓	✓
Acetic acid	✓	✓	✓	✓
Hydrochloric acid	✓	✓	✓	✓
Sulphuric acid	✓	✓	✓	✓
Citric acid	✓	✓	✓	✓
Arsenic acid	×	×	×	×
Hydroflouric acid	×	×	×	×
Carbonic acid	×	×	×	×
Nitric acid	×	×	×	×
Bases				
Ammonium hydrox.	✓	✓	✓	✓
Potassium hydroxide	✓	✓	✓	✓
Calcium hydroxide	✓	✓	✓	✓
Magnesium hydrox.	✓	✓	✓	✓
Sodium hydroxide	✓	✓	✓	✓
Others				
Ethylene glycol	✓	✓	✓	✓
Formaldehyde	✓	✓	✓	✓
Freon	✓	✓	✓	✓
Calcium oxide	✓	✓	✓	✓
Sodium nitrate	✓	✓	✓	✓
Water 20 °C	✓	✓	✓	✓
Zinc sulphate	✓	✓	✓	✓
Ammonia	×	×	×	✓
Steam > 100 °C	×	×	×	×

Mating material

deva.tex sliding materials require the use of a mating material with a hardness of at least 180 HB. In the case of abrasive environments, a hardened mating surface should be used. The surface roughness when using deva.tex should ideally have a R_a value = 0.4 to 1.0 µm. Increased surface roughness leads only to a slightly higher wear rate. However, a decreased deviation, for example R_a < 0.4 could lead to significant failure.

The roughness can for example be generated by grinding or abrasive blasting. The grinding ridges should preferably run transversely to the sliding direction. The corrosion resistance required from the mating material should be determined according to the relevant operating conditions. The adjacent table provides an overview of some possible mating materials.

Mating materials for standard applications — Table 4.1.A

Material number	DIN designation	Comparable standards		
		USA – ANSI	GB – B.S. 9 70	F – AFNOR
1.0543	ZSt 60-2	Grade 65	55C	A60-2
1.0503	C45	1045	080M46	CC45
1.7225	42CrMo4	4140	708M40	42CD4

Mating materials for corrosive environments — Table 4.1.B

Material number	DIN designation	Comparable standards		
		USA – ANSI	GB – B.S. 9 70	F – AFNOR
1.4021	X20Cr13	420	420S37	Z20C13
1.4057	X17CrNi-16-2	431	432S29	Z15CN16.02
1.4112	X90CrMoV18	440B	–	(Z70CV17)
1.4122	X35CrMo17-1	–	–	–

Mating materials for seawater applications — Table 4.1.C

Material number	DIN designation	Comparable standards		
		USA – ANSI	GB – B.S. 9 70	F – AFNOR
1.4460	X3CrNiMoN27-5-3	329	–	–
1.4462	X2CrNiMoN22-5-3	UNS531803	318513	Z3CND24-08
2.4856	Inconel 625	–	–	–

5 Fits

Recommended fitting and tolerance ranges			Table 5.1
	Fits		
	Standard	Precision	
Housing bore	H7	H7	
Bearing bore (after installation)	D11	D8 E8[1]	H8[1]
Shaft	h8	h7	d7 e7

[1] Exception for diameter ≤ 40 mm: Quality IT9

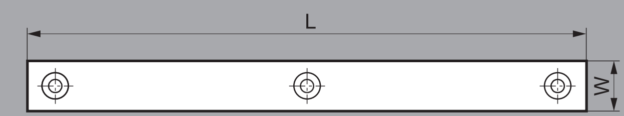
- **deva.tex**® is pressed into the housing with an interference fit by means of screw press, hydraulic press or press mandrel. Tapping or driving into place is not permissible.
- Standard housing bore is **H7**
- Average roughness of housing: R_a = 3.2 µm
- The housing should be provided with a 20° - 40° chamfer for an easier installation.
- Higher precision standards (**IT7** or better) can be achieved by machining the bearing bore after installation. For this purpose, **deva.tex** can be produced with a machining allowance.

6 Designs

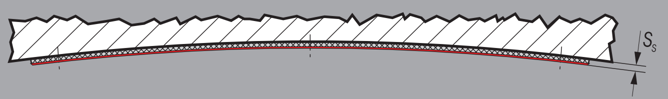
6.1 Design examples

Radial and axial segments

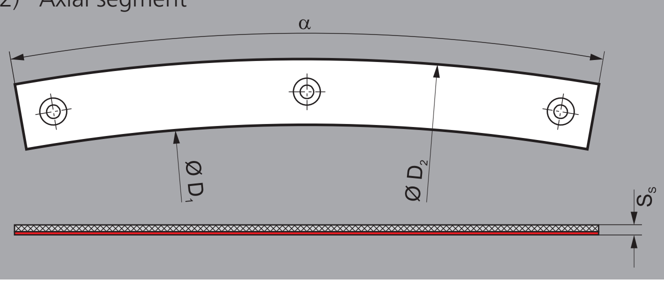
1a) Sliding plate for radial segment



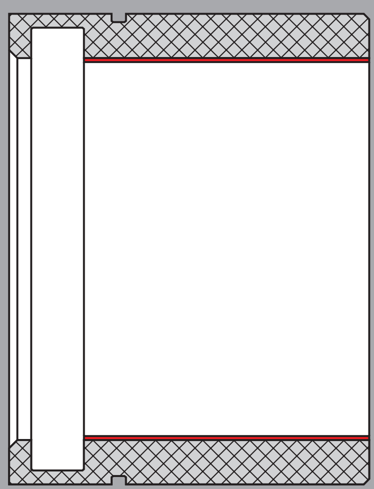
1b) Sliding plate screwed in place



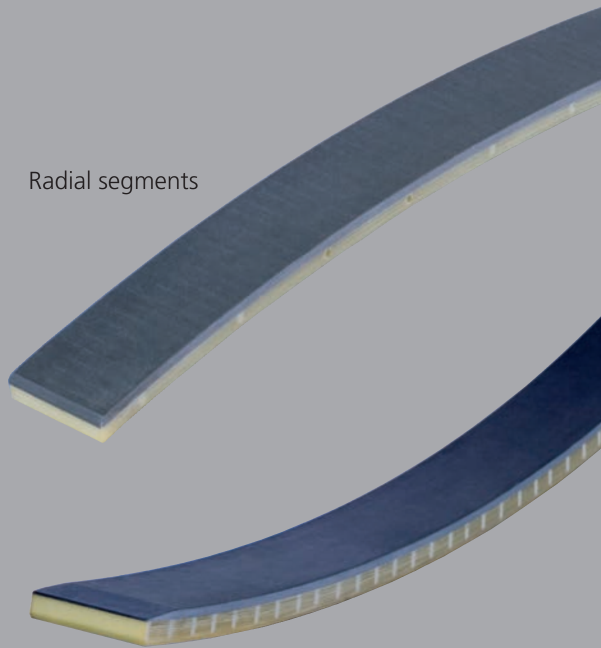
2) Axial segment



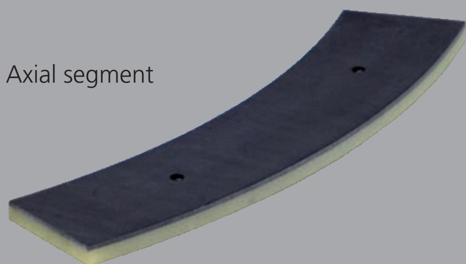
deva.tex guide vane bearing, water turbine



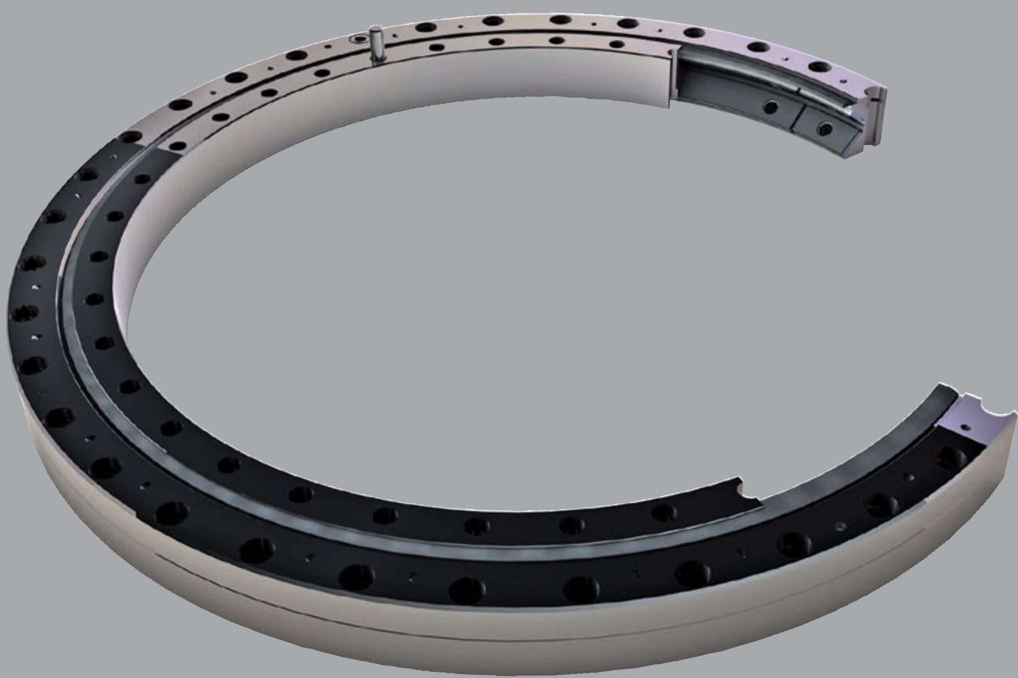
deva.tex rotary sliding connection in railway vehicles



Radial segments



Axial segment

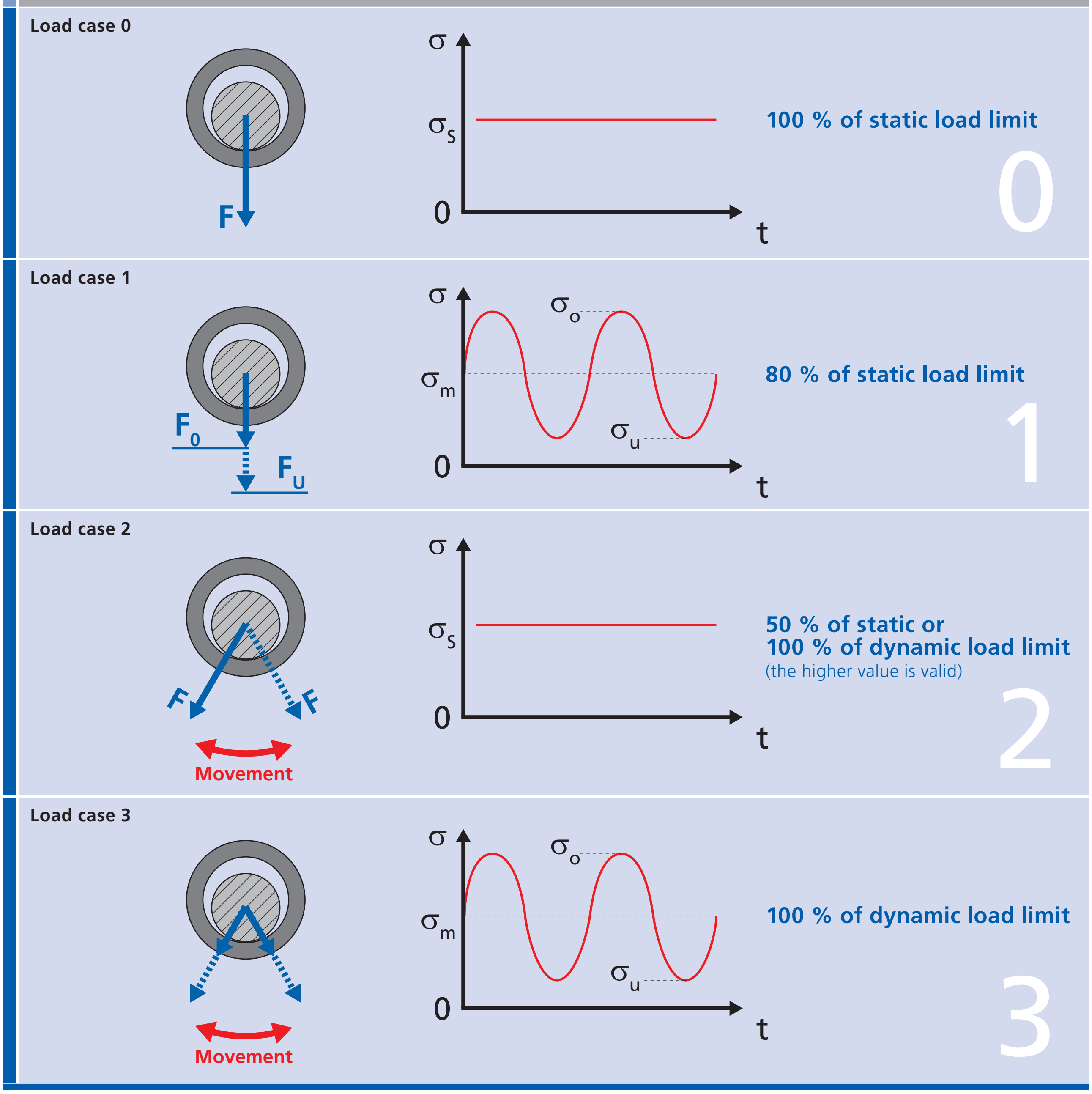


6.2 Description what values to be considered for design

DEVA® differentiates load cases (0 to 3) regarding the character of load stressing a bearing. This is to consider fatigue influences in case of dynamic pressure. The percentage values are refering to the limit values described in the material data sheet or technical handbooks.

This worksheet is related to **DEVA** work instruction A 616 (see also "Qualitäts-, Umwelt- und Arbeitsschutz-Management Handbuch, Verfahrensanweisungen + Arbeitsanweisung").

Load cases 0-3 — Figure 6.2.1

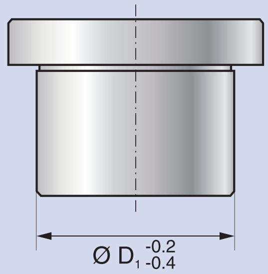


Installation

7.1 Installation of cylindrical deva.tex® bearings

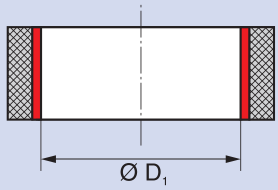
Installation of deva.tex bearings by press-fitting | Figure 7.1.1

Press-fit mandrel



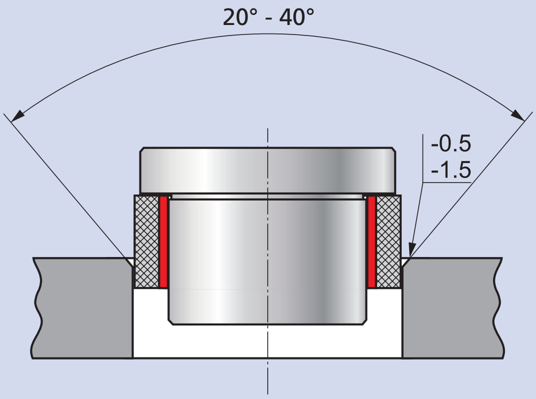
1

deva.tex bearing



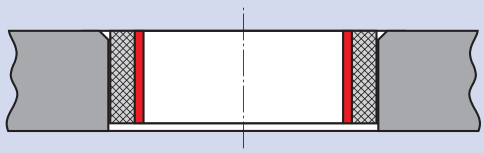
2

Housing



3

Housing with bearing

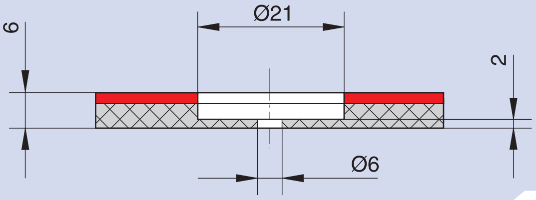


4

7.2 Installation of deva.tex® sliding plates

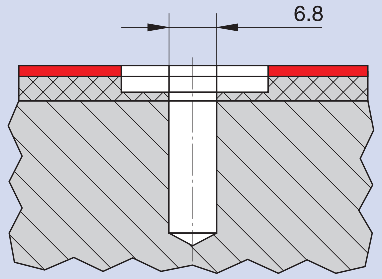
Installation of deva.tex sliding plates with countersunk screws and fixing devices Figure 7.2.1

As-delivered dimensions of deva.tex sliding plate



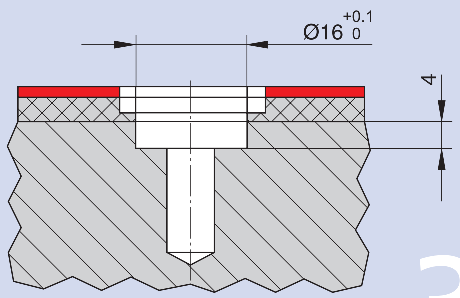
1

Drill tap hole



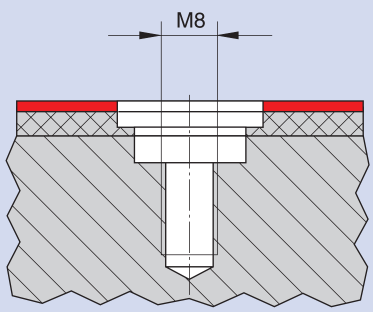
2

Apply with cylindrical counter bore



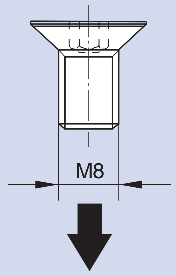
3

Machining of metric thread



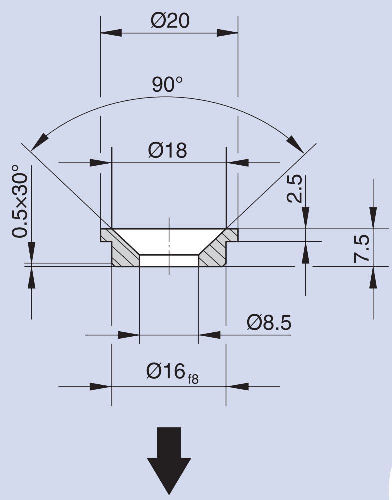
4

Countersunk screw M8 (according to EN ISO 10642)



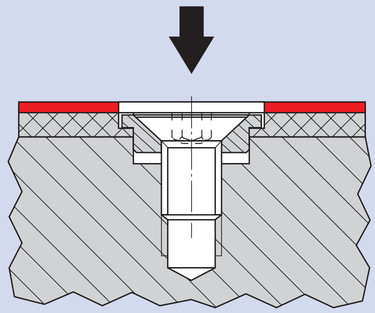
5

Fixing clamp (can be provided by DEVA)



6

deva.tex sliding plate after installation

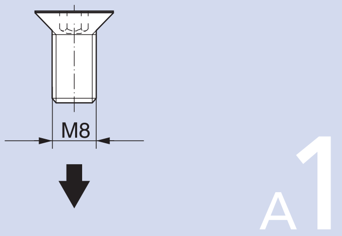


7

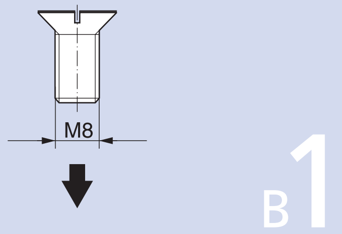
Installation of deva.tex sliding plates with M8 countersunk screws

Figure 7.2.2

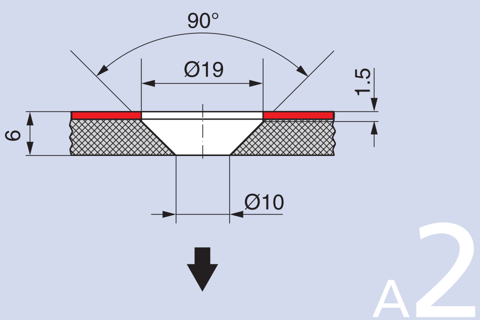
Countersunk socket screw M8 (according to EN ISO 10642)
also valid for Torx



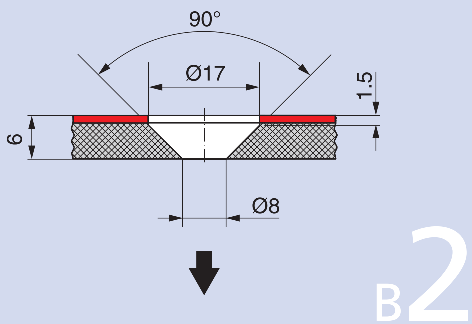
Slotted countersunk screw M8 (according to ISO 2009)



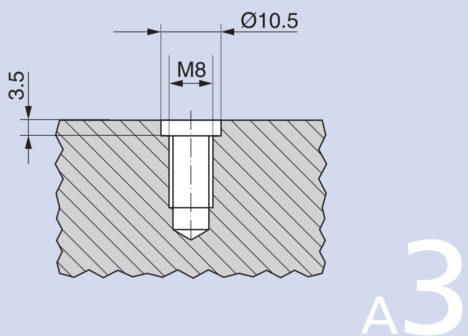
deva.tex sliding plate



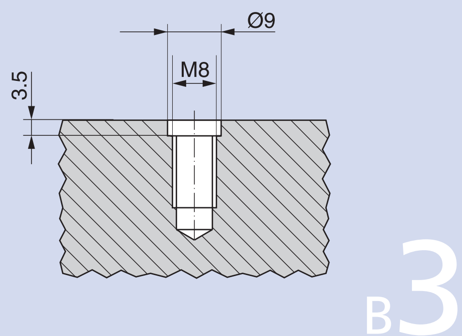
deva.tex sliding plate



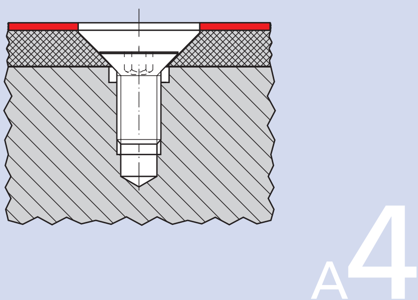
Base material



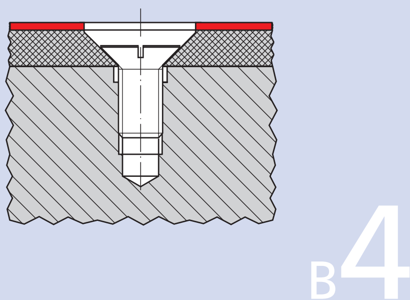
Base material



deva.tex sliding plate after installation



deva.tex sliding plate after installation



Mounting
During mounting, secure the screws with metal adhesive “Loctite 243” for intermediate strength or „Loctite 278“ for high-strength bolting. The operating temperature limits and manufacturer’s details must be observed.

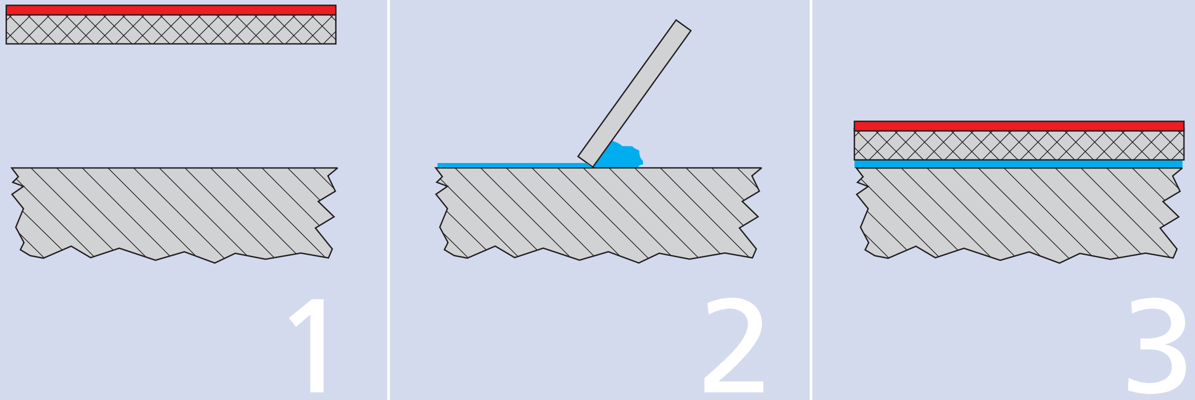
Installation of deva.tex sliding plates with adhesive

Figure 7.2.3

Preparation
Roughen the surfaces to be joined (e.g. with emery paper, grain size 120). Clean surfaces thoroughly.

Application of adhesive
Apply the adhesive using a toothed spatula (0.5 - 1 mm).

Mounting
Join surfaces by applying slight pressure and leave to set.



Recommended adhesive
Loctite 496 or 3425 (observe manufacturer's directions)

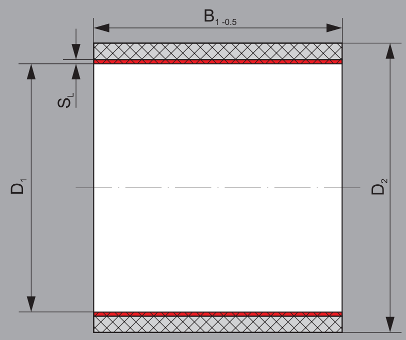
7.3 Installation of deva.tex® sliding bearings by supercooling

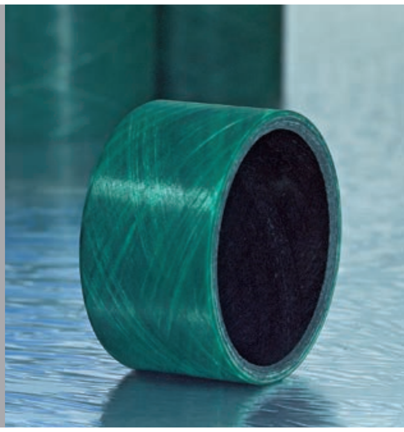
deva.tex precision bearings with inside diameters of 150 mm and above can also be installed by supercooling in liquid nitrogen.

Standard dimensions

8.1 Standard dimensions for deva.tex® 552 cylindrical bearings

Cylindrical bearings





Standard nominal dimensions deva.tex 552 cylindrical bearings

Table 8.1

D_1 mm	D_2 mm	B_1 mm
16	20	15
16	20	20
20	24	15
20	24	20
20	24	25
22	26	15
22	26	20
22	26	25
25	30	20
25	30	25
25	30	30
25	30	40
28	34	20
28	34	30
28	34	35
28	34	40
30	36	25
30	36	30
30	36	35
30	36	40
35	41	30
35	41	35
35	41	40
35	41	50
40	48	20
40	48	30
40	48	40
40	48	50
45	53	35
45	53	45
45	53	50
45	53	55
45	53	60
50	58	30
50	58	40

D_1 mm	D_2 mm	B_1 mm
50	58	50
50	58	60
55	63	40
55	63	50
55	63	55
55	63	70
60	70	40
60	70	45
60	70	50
60	70	60
60	70	75
65	75	50
65	75	60
65	75	65
65	75	80
70	80	40
70	80	55
70	80	70
70	80	85
75	85	50
75	85	60
75	85	75
75	85	90
80	90	60
80	90	70
80	90	80
80	90	90
80	90	100
85	95	65
85	95	85
85	95	100
85	95	105
90	105	70
90	105	80
90	105	90

D_1 mm	D_2 mm	B_1 mm
90	105	110
90	105	120
95	110	75
95	110	95
95	110	100
95	110	115
100	115	80
100	115	90
100	115	100
100	115	120
100	115	130
110	125	85
110	125	100
110	125	110
110	125	120
110	125	135
120	135	90
120	135	100
120	135	120
120	135	130
120	135	150
130	145	100
130	145	120
130	145	130
130	145	150
130	145	160
140	155	100
140	155	110
140	155	120
140	155	130
140	155	140
140	155	150
140	155	170
150	165	100
150	165	120

D_1 mm	D_2 mm	B_1 mm
150	165	130
150	165	150
150	165	180
160	180	120
160	180	130
160	180	150
160	180	160
160	180	180
180	200	120
180	200	140
180	200	180
180	200	200
180	200	220
200	220	180
200	220	200
220	240	1)
230	250	1)
240	260	1)
250	270	1)
260	280	1)
280	300	1)
300	330	1)
320	350	1)
330	360	1)
340	370	1)
350	380	1)
380	410	1)
400	430	1)
420	450	1)
440	480	1)
450	490	1)
480	520	1)
500	540	1)

Further sizes available on request. Machining allowance for precision bearings on request. 1) Width on request

The sliding layer consists of wound fibre with embedded solid lubricant. Machined surface for precision bearings. Deburring by friction grinding. Lead-in chamfer can be produced by mechanical machining.

Due to residual stresses, measurement of roundness and tolerances can only be performed after installation into housing or ring gauge.

Standard dimensions for sliding layer thicknesses

D_1	S_L
mm	mm
≤ 50	min. 0.6
≤ 100	min. 1.0
≤ 200	min. 1.5
≤ 300	min. 2.0
≤ 400	min. 2.75
≤ 500	min. 3.5

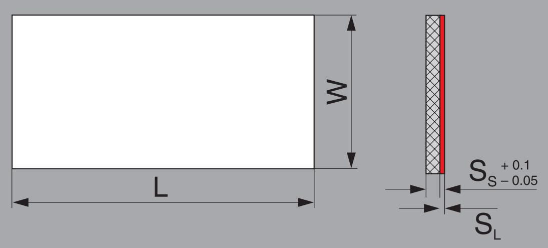
Special dimensions – Possible sliding layer thicknesses

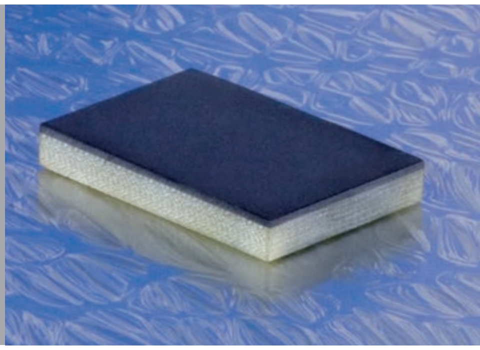
Minimum wall thickness: wall thickness = $D_1 \times 0.03 + 0.8$

D_1	S_L
mm	mm
≤ 100	max. 1.5
≤ 200	max. 3.0
≥ 200	max. 3.5

8.2 Producible dimensions for deva.tex® 532 sliding plates

deva.tex 532
Sliding plates





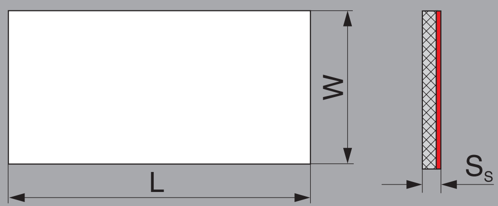
Dim. of deva.tex 532 standard sliding plates — Table 8.2.1

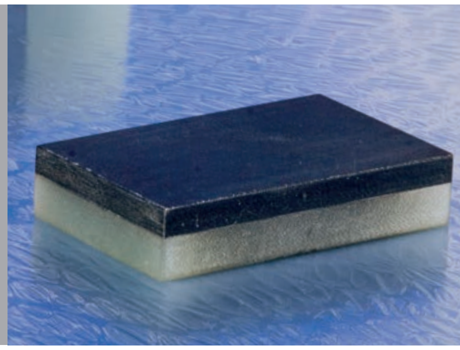
L[1)]	W[1)]	S_S[1)]	S_L
mm	mm	mm	mm
965 ±0.1	245 ±0.1	5	1
965 ±0.1	245 ±0.1	6.0	1.5
965 ±0.1	245 ±0.1	8	1.5
965 ±0.1	245 ±0.1	10	2

[1)] Further sizes available on request.
S_S = Wall thickness
S_L = Sliding layer thickness

8.3 Producible dimensions for deva.tex® 542 sliding plates

deva.tex 542
Sliding plates



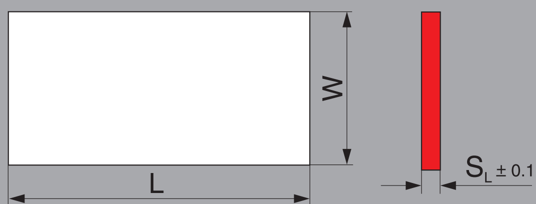


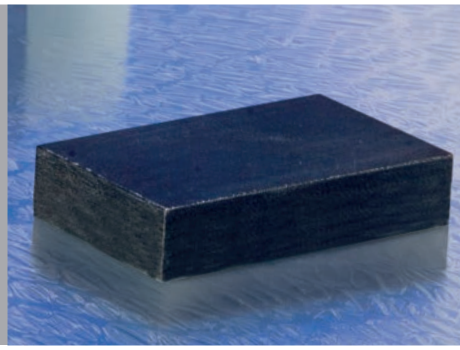
Dimensions of deva.tex 542 sliding plates		Table 8.3.1
L[1)]	W[1)]	S_S[1)]
mm	mm	mm
1050 ±0.15	625 ±0.15	2 - 100

[1)]Further sizes available on request.

8.4 Producible dimensions for deva.tex® 541 sliding plates

deva.tex 541
Sliding plates



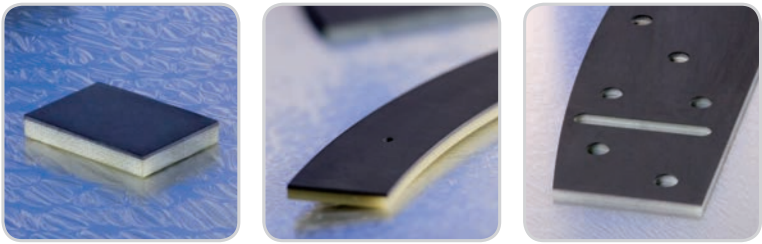


Dimensions of deva.tex 541 sliding plates		Table 8.4.1
L[1)]	W[1)]	S_L min. [1)]
mm	mm	mm
1250 ±0.3	1050 ±0.3	1 - 100 ±0.25

[1)] Customized dimensions of deva.tex 541 sliding plates are available on request

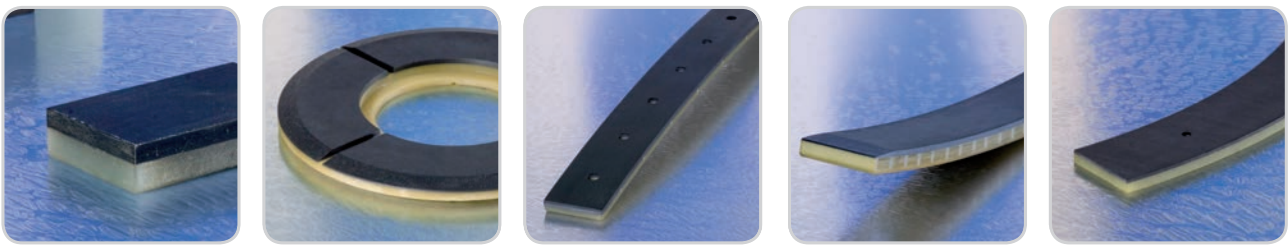
8.5 Basic forms

deva.tex® 532

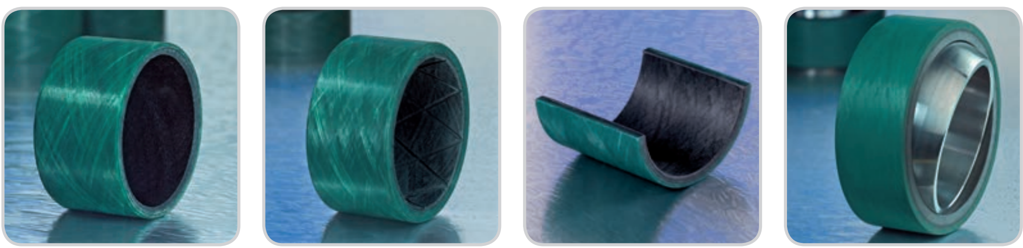


deva.tex® 541

deva.tex® 542



deva.tex® 552



Data relevant to the design of DEVA® bearings

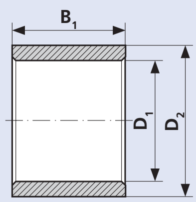
Questionaire 9.1.A

Description of application

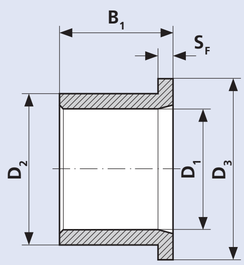
☐ Steel Industry ☐ Steam and Gas Turbines ☐ Railway ☐ New design
☐ Wind Energy ☐ Offshore and Marine ☐ Hydro Power ☐ Existing design
☐ Rubber and Plastic Industry ☐ Heavy-duty Vehicles ☐ Others

Project No.

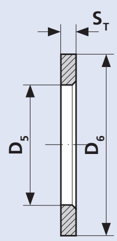
☐ Plain bearing



☐ Flanged bearing

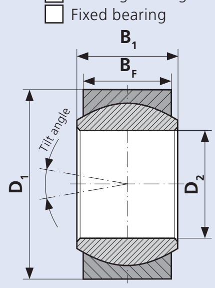


☐ Thrust washer

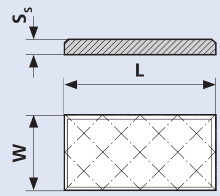


☐ Spherical bearing

☐ Floating bearing
☐ Fixed bearing



☐ Sliding plate



☐ Shaft rotates ☐ Bearing rotates ☐ Angular motion ☐ Axial motion

		Item 1	Item 2	Item 3
Quantity				
Dimensions [mm]		Item 1	Item 2	Item 3
Inner diameter	D_1 (D_5)			
Outer diameter	D_2 (D_6)			
Bearing width	B_1			
Outer ring width	B_F			
Flange outer diameter	D_3			
Flange thickness	S_F			
Wall thickness	S_T			
Plate length	L			
Plate width	W			
Plate thickness	S_S			
Loading		Item 1	Item 2	Item 3
Static		☐	☐	☐
Dynamic		☐	☐	☐
Alternating		☐	☐	☐
Impact		☐	☐	☐
Radial load [kN]				
Axial load [kN]				
Surface pressure				
Radial [MPa]				
Axial [MPa]				
Mating material		Item 1	Item 2	Item 3
Material no./type				
Hardness [HB/HRC]				
Roughness R_a [µm]				
Housing material		Item 1	Item 2	Item 3
Material no./type				
Lubrication		Item 1	Item 2	Item 3
Dry running		☐	☐	☐
Permanent lubrication		☐	☐	☐
Medium lubrication		☐	☐	☐
Medium				
Lubricant				
Initial lubrication		☐	☐	☐
Hydrodyn. lubrication		☐	☐	☐
Dynamic viscosity				

Motion	Item 1	Item 2	Item 3
Speed [rpm]			
Sliding speed [m/s]			
Stroke length [mm]			
Double strokes [/min]			
Rotating angle [°]			
Frequency [n/min]			
Tilt angle (spherical bearing) [°]			
Operating time	Item 1	Item 2	Item 3
Continuous operation			
Intermittent operation			
Duty operation [%/h]			
Days/year			
Frictional distance [km]			
Fits/tolerances	Item 1	Item 2	Item 3
Shaft			
Bearing housing			
Environmental conditions	Item 1	Item 2	Item 3
Temperature at bearing			
Contact medium			
Other influences			
Lifetime	Item 1	Item 2	Item 3
Desired operating time [h]			
Permissible wear [mm]			

Company	
Company name	
Address	
Contact person	
Phone	
Fax	
Cell-phone	
E-mail	

02.13

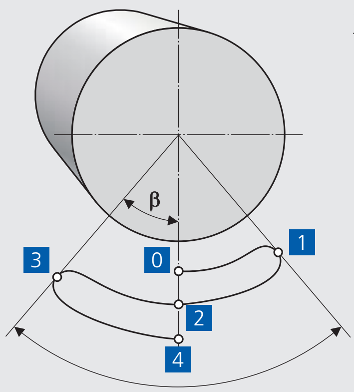
FEDERAL-MOGUL POWERTRAIN

Questionaire 9.1.B

Remarks

	yes	no
Certificate required (e.g. 3.1)	☐	☐
Acceptance procedure (e.g. 3.2)	☐	☐

Explaination



* angle: According to DEVA® definition, one cycle is four times the angle **β**.
This is the basis to calculate the expected sliding distance.

Example: Bushing $\mathbf{D_1}$ = 50 mm and agle **β** = 5° → 1 cycle shows a sliding distance of 8,73 mm

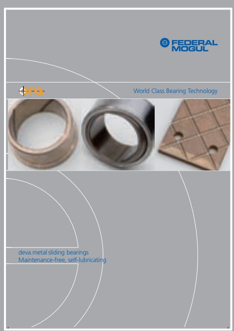
Portfolio

DEVA® in marine/offshore

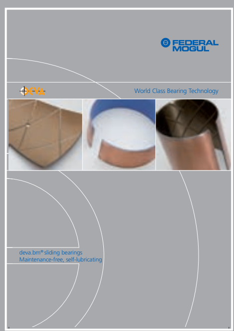
DEVA® in heavy-duty

DEVA® in the steel industry

Industry solutions

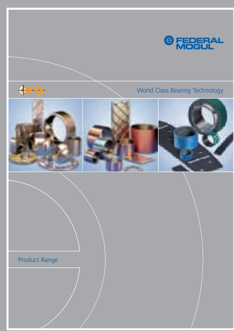


deva.metal®



deva.bm®

deva.glide®



Product range

Spherical bearings

Product information

Disclaimer

The present technical documentation has been prepared with care and all the information verified for its correctness. No liability, however, can be accepted for any incorrect or incomplete information. The data given in the documentation are intended as an aid for assessing the suitability of the material. They are derived from our own research as well as generally accessible publications.

The sliding friction and wear values stated by us or appearing in catalogues and other technical documentation do not constitute a guarantee of the specified properties. They have been determined in our test facilities under conditions that do not necessarily reflect the actual application of our products and their service environment or permit comprehensive simulation in relation to them.

We provide guarantees only after written agreement of the test procedures and parameters and of all the relevant characteristics which the product is required to have.

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