Self-lubricating bearings for Steel Applications
deva.bm®

deva.bm is a thin-walled, self-lubricating composite sliding material. It consists of a backing made of standard steel, stainless steel or bronze with a deva.metal® layer applied in a combined rolling/sintering process. deva.bm uses graphite as lubricant. deva.bm offers basically the same bearing characteristics as deva.metal but is capable of handling even higher loads and offers an economic solution to many bearing problems.

Reference applications
Cold plate levelers, mandrels, ladle hangers, coil cars, changing systems, shears, etc.

<table>
<thead>
<tr>
<th>Material properties and tolerances deva.bm</th>
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<tr>
<td><strong>Properties</strong></td>
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<tr>
<td>Max. permitted static load (P) – [MPa]</td>
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<td>Max. permitted dynamic load (P) – [MPa]</td>
</tr>
<tr>
<td>Max. sliding speed (U) – [m/s]</td>
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<tr>
<td>Max. P-U-value – [MPa × m/s]</td>
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<td>Friction coefficient – [µ]</td>
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<td>Housing bore</td>
<td>H7</td>
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<tr>
<td>Bearing inner Ø</td>
<td>H9/H9 after inst.</td>
</tr>
<tr>
<td>Shaft Ø</td>
<td>d7/e7</td>
</tr>
<tr>
<td>Counter material hardness</td>
<td>&gt; 180HB</td>
</tr>
<tr>
<td>Shaft surface finish</td>
<td>Rz 0.2 to 0.8 µm</td>
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Microsection deva.bm

1. Sliding surface
2. Sliding layer (bronze)
3. Solid lubricant (graphite)
4. Backing

Tolerances
Other installation tolerances are possible, provided that a safe fit in the housing and the necessary running clearance are maintained.

Installation
Press-fit installation or supercooling.

High performance materials – Metal based backing with deva.metal sliding layer and stainless steel backing and PTFE as lubricant maintenance-free
deva.metal®

deva.metal is a self-lubricating bearing material manufactured by advanced powder metallurgy. It is fully compacted, unlike oil-impregnated porous bronze materials that are weak by comparison. deva.metal is provided with an evenly distributed solid lubricant throughout its metallic matrix. deva.metal is suitable for dry running at slow sliding speeds and high loads and it is stick-slip free. It has high resistance to temperature and corrosion. deva.metal is insensitive to contamination and edge pressures and can be easily machined if required.

Reference applications
Cooling beds, furnace applications, mandrels, dummy bar chains, shears, wheels, etc.

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| Tolerances                                     | Value                      |
| Housing bore                                   | H7                        |
| Bearing outer Ø                                | r6                        |
| Bearing inner Ø                                | C7 for D8 after inst. or D7/E8 |
| Shaft Ø                                        | h7                        |
| Counter material hardness                      | depending on the DEVA material |
| Shaft surface finish                           | R<sub>s</sub> 0.2 to 0.8 µm |

Microsection deva.metal

1. Bronze, iron or nickel matrix
2. Solid lubricant (Graphite, WS2, MoS<sub>2</sub> and other)

Tolerances
Other installation tolerances are possible, provided that a safe fit in the housing and the necessary running clearance are maintained.

Installation
Press-fit installation or supercooling.
Today Federal-Mogul DEVA is valued worldwide as a particularly prime address for maintenance-free, self-lubricating sliding bearings optimized for the toughest conditions in the iron and steel industry. Used in countless applications within this sector by major OEMs and end users, DEVA is certified according to ISO 9001:2008, ISO/TS 16949:2009, ISO 14001:2004 and OHSAS 18001:2007. At our location in Germany, we use state-of-the-art equipment to develop and manufacture bearing systems from 1 to 32,000 mm in diameter.

With our highly motivated team, we have one aim only: to constantly reaffirm the satisfaction of our customers, thus ensuring steady growth in demand for DEVA® products. Find more information in the Internet under www.deva.de or www.federalmogul.com

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. All transactions conducted by DEVA® are subject, in principle, to our terms of sale and delivery as indicated in our offers, product brochures and price lists. Copies are available on request. Our products are subject to a constant process of development. DEVA® reserves the right to amend the specification or improve the technological data without prior notice.

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From iron ore to steel with DEVA

1. Steel making & secondary metallurgy
   - Regulating device in compressor for BOF
   - Sliding rings in sealing system of BOF
   - Wheels in charging car of converter
   - Lifting device in EAF
   - Tap hole drilling machine
   - Torpedo car
   - Ladle tilting device
   - Ladle hanger
   - Mobile inert gas coupling system in ladle transfer car

2. Continuous casting
   - Spherical bearing for hydraulic cylinder in ladle turret
   - Flanged bearing in swivel arm of ladle turret
   - Cylindrical bearing in dummy bar chain
   - Adjustable strand guide in CC
   - Guide roller in bloom caster
   - Torch cutting machine
   - Sliding plates in weight system of tundish car
   - Adjusting device of tundish car
   - Track roller bearing in torch cutting machine
   - Toggle joints in dividing shear
   - Knife guide system in dividing shear

3. Hot & cold forming
   - Main bearing for excenter shaft in pendulum shear
   - Sliding plates for roller changing system
   - Coil box (various)
   - Side guard system in rolling mill
   - Coil car scissor unit
   - Guide system in reversing mill
   - Sliding plates in mandrel
   - Cold & hot plate leveler
   - Lifting device in walking beam
   - Main drive in walking beam
   - Knife gap adjusting device in hot dividing shear
   - Height adjusting device in dividing shear
   - Carrying & support wheels in plate cooling bed

4. Various
   - Gripping tong for forging manipulator
   - Quenching station for tubes
   - Crane bucket
   - Conveyors
   - Turnover rail car dumper
   - Crane tong application

DEVA – Global partner for the steel industry

From iron ore to steel with DEVA

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Steel works applications

1. Lifting device EAF
2. Ladle hanger
3. Spherical bearing for hydraulic cylinder in ladle turret
4. Flanged bearing in swivel area of ladle turret
5. Sliding plates in weight system of tundish car
6. Adjusting device of tundish car
7. Adjustable strand guide in CC
8. Toggle joints in diving shear
9. Knife guide system in diving shear
10. Knife gap adjusting device in hot dividing shear
11. Height adjusting device in dividing shear
12. Sliding plates for roller changing system
13. Sliding plates in mandrel
14. Lifting device in coil handling system
15. Coil car scissor unit
16. Crane tong

By courtesy of SMS Siemag AG