

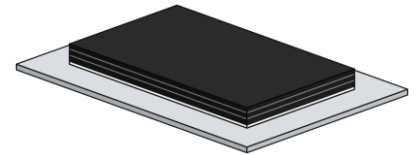
TECHNICAL DATA SHEET

ELASTOMERIC SLIDING BEARINGS – REINFORCED, FOR HIGH LOADS

SLIDEBLOCK HD is a sliding bearing for supporting reinforced concrete and steel members where horizontal movements must not be restrained. The bearing consists of two separate parts: an upper steel-plate-reinforced elastomeric pad with a PTFE facing and a lower sliding plate. The pad carries the vertical load and accommodates irregularities of the bearing surfaces and rotation of the supported member. Movements caused by temperature changes, shrinkage and creep of concrete take place as the PTFE facing slides on the plate, so large movements are not taken up by shear deformation of the pad and the sliding plane remains stable.

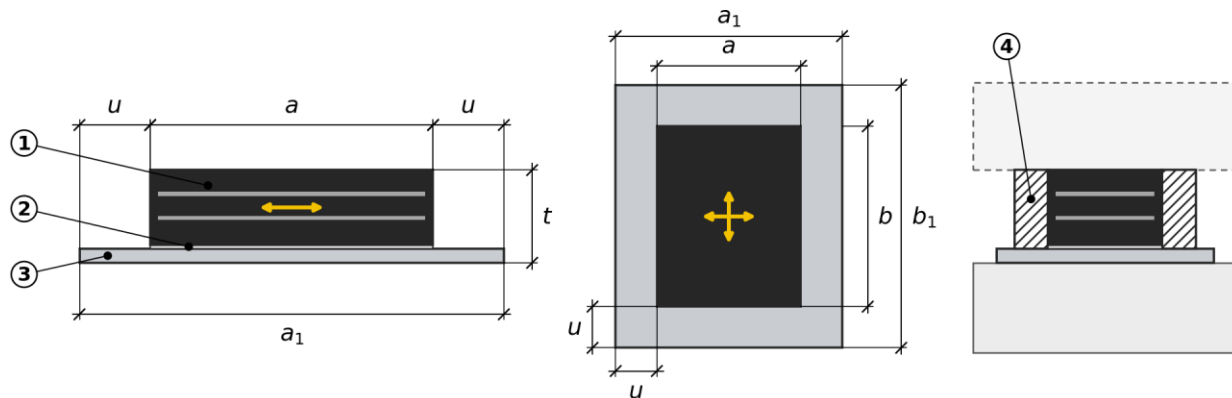
Applications:

- Supports of precast concrete beams, girders and slabs;
- Supports of cast-in-place concrete structures;
- Supports of steel structures.



SLIDEBLOCK HD

The SLIDEBLOCK HD pad is made of 70 Shore A elastomer reinforced with vulcanised-in steel plates; its sliding face in contact with the plate is covered with a PTFE (polytetrafluoroethylene) layer. The sliding plate is made of engineering plastic or stainless steel. Total bearing thickness including the sliding plate $t = 11, 14, 18$ or 20 mm; design compressive resistance $\sigma_{R,d} = 28 \text{ N/mm}^2$ for all thicknesses and sizes.



Left – bearing section, centre – plan, right – version for cast-in-place concrete. 1 – steel-plate-reinforced elastomeric pad; 2 – PTFE sliding layer; 3 – sliding plate; 4 – protective frame; $a \times b$ – pad dimensions; $a_1 \times b_1$ – sliding plate dimensions; u – sliding travel in one direction; t – total bearing thickness.

DESIGN

The pad dimensions $a \times b$ are selected from the condition $F_{E,d} \leq F_{R,d} = \sigma_{R,d} \cdot a \cdot b$, where $F_{E,d}$ is the vertical design load, $\sigma_{R,d} = 28 \text{ N/mm}^2$. The sliding plate is larger than the pad by the required movement in each direction: $a_1 = a + 2u$, $b_1 = b + 2u$ (u – maximum movement in one direction); the movement is not limited. The rotation of the supported member, including non-parallelism and unevenness of the bearing surfaces, shall not exceed the permissible angle $\alpha_{\max}$, which depends on the bearing thickness and on the pad side a in the direction of rotation: $\alpha_{\max} = 1000/a \text{ ‰}$ for $t = 11$ and 14 mm, and $\alpha_{\max} = 2000/a \text{ ‰}$ for $t = 18$ and 20 mm (a in mm). The bearing transfers only the friction force $H = \mu \cdot F$ to the support; any other horizontal forces must be resisted by separate structural measures. Service temperature range: -35 °C to $+70 \text{ °C}$.

DESIGN TABLE

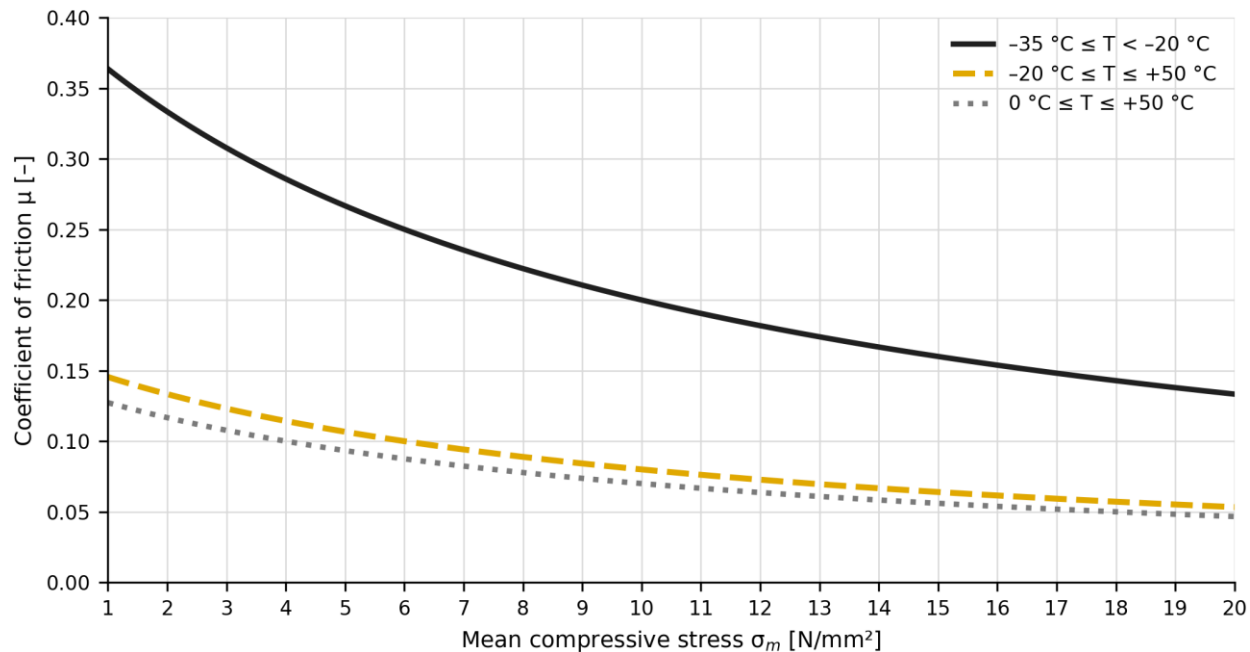
SLIDEBLOCK HD ($t = 11 / 14 / 18 / 20 \text{ mm}$; $\sigma_{R,d} = 28 \text{ N/mm}^2$)					
Pad side a (direction of rotation) [mm]	Design resistance $\sigma_{R,d} [\text{N/mm}^2]$	Permissible rotation $\alpha_{\max} [\text{‰}]$			
		t = 11 mm	t = 14 mm	t = 18 mm	t = 20 mm
120	28.0	8.3	8.3	16.6	16.6
130	28.0	7.6	7.6	15.3	15.3
140	28.0	7.1	7.1	14.2	14.2
150	28.0	6.6	6.6	13.3	13.3
160	28.0	6.2	6.2	12.5	12.5
170	28.0	5.8	5.8	11.7	11.7
180	28.0	5.5	5.5	11.1	11.1
190	28.0	5.2	5.2	10.5	10.5
200	28.0	5.0	5.0	10.0	10.0
220	28.0	4.5	4.5	9.0	9.0
240	28.0	4.1	4.1	8.3	8.3
260	28.0	3.8	3.8	7.6	7.6
280	28.0	3.5	3.5	7.1	7.1
300	28.0	3.3	3.3	6.6	6.6
350	28.0	2.8	2.8	5.7	5.7
400	28.0	2.5	2.5	5.0	5.0
450	28.0	2.2	2.2	4.4	4.4
500	28.0	2.0	2.0	4.0	4.0
550	28.0	1.8	1.8	3.6	3.6
600	28.0	1.6	1.6	3.3	3.3

Resistance $FR,d = \sigma_{R,d} \cdot a \cdot b$; verification $FE,d \leq FR,d$. The permissible rotation depends on the pad side a in the direction of rotation: $\alpha_{\max} = 1000/a \text{ ‰}$ for $t = 11$ and 14 mm , and $\alpha_{\max} = 2000/a \text{ ‰}$ for $t = 18$ and 20 mm ; values rounded down. Bearings can be made in any intermediate size; intermediate values may be interpolated. Sliding plate dimensions $a_1 = a + 2u$, $b_1 = b + 2u$.

COEFFICIENT OF FRICTION

Friction between the PTFE facing and the sliding plate depends on service conditions: it is higher at low temperature and at low mean compressive stress, increases as the sliding surfaces wear, and is highest at break-away after a longer period

at rest. For calculating horizontal forces transferred to the supporting structure, the upper-bound friction coefficients shown in the chart are recommended (design assumption based on published test data for PTFE sliding pairs).



In the chart σ_m is the mean compressive stress under characteristic actions. Where the bearing is used in heated spaces and its temperature does not fall below 0 °C, the lower curve may be applied. The positional stability of the bearing is not based on friction: at mean compressive stresses below 3 N/mm², and on steel bearing surfaces, the bearing position is secured by structural measures (see "Installation").

INSTALLATION

On reinforced concrete, the bearing is placed so that its entire area lies within the zone confined by the reinforcement of the supporting member – this protects the concrete edges from spalling. Concrete surfaces normally provide sufficient static friction, so no additional fixing is required. The exception is low mean compressive stress (below 3 N/mm²), especially at temperatures below –20 °C: in this case the sliding plate should be bonded to the concrete member with a suitable construction adhesive.

On steel bearing surfaces, both parts of the bearing – the pad and the sliding plate – are fixed to the adjacent members so that they cannot move, e.g. by welded retaining strips around the edges or bolted cleats. Depending on the structural arrangement, the sliding plate may be installed at the bottom or at the top. For cast-in-place concrete, a bearing with a protective frame is used, which prevents concrete from entering the sliding zone and blocking the movement. During installation, the bearing and the bearing surfaces must be clean – free of grease, oil, solvents, mortar and ice; the PTFE facing and the sliding surface of the plate must be protected from scratches. Bearings must not be stacked on top of each other.

SIZES, SHAPES AND DIMENSIONAL TOLERANCES

Bearings are made to project dimensions: the pad dimensions $a \times b$ can be chosen freely, and the sliding plate size is determined by the required movement. Total bearing thickness including the sliding plate: 11, 14, 18 or 20 mm. Supplied versions: without protective frame – for precast and steel structures; with protective frame – for cast-in-place concrete, ready for casting.

Tolerances:

Pad length and width ± 2 mm; sliding plate length and width ± 1 mm; total bearing thickness ± 1 mm.

SPECIFICATION TEXT

Steel-plate-reinforced elastomeric sliding bearing with PTFE facing and sliding plate for supporting reinforced concrete and steel structures; design compressive resistance $\sigma_{R,d} = 28 \text{ N/mm}^2$.

Product: METALBETA SLIDEBLOCK HD ☐ without protective frame ☐ with protective frame

Pad $a \times b$: _____ $\times$ _____ mm Thickness t : ☐ 11 mm ☐ 14 mm ☐ 18 mm ☐ 20 mm

Sliding plate $a_1 \times b_1$: _____ $\times$ _____ mm Sliding travel u : $\pm$ _____ mm

Quantity: _____ pcs.