

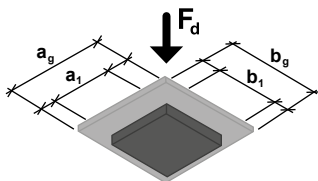
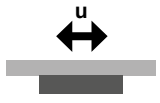

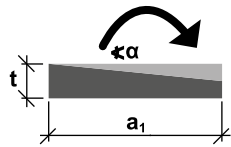
## Ciparall® sliding bearing Type GFK

Elastomeric deformation sliding bearing for static structural component supports

### Design values

The bearings are dimensioned according to the general building authority approval up to a compressive stress  $\sigma_{R,d} = 21 \text{ N/mm}^2$ . Holes, cut-outs and the required edge distances must be taken into account according to DIN EN 1992.

#### TYPE OF LOAD ACTING

Design value of bearing resistance	Deformation	Bearing structure	all. rotation angle
			

#### FORMEL

$\sigma_{R,d} \leq 21 \text{ [N/mm}^2\text{]}$	$u = \text{variable}$	$t_1 = 2.6 \text{ mm sliding plate}$	$\text{all. } \alpha = \frac{2000}{a_1} \leq 40 \text{ [‰]}$
Approval no. 16.22-525	coefficient of friction 0.04 at 15 N/mm <sup>2</sup> after an accumulated sliding distance of 201 m.	$t_2 = 11.4 \text{ mm Elastomer body}$	(Rectangular bearing)
$A_E = a_1 \times b_1 \text{ [mm}^2\text{]}$		$t = \text{bearing thickness}$	Additional rotation acc. to technical approval:
Evidence: $\sigma_{E,d} \leq \sigma_{R,d}$	Further values can be found in the approval.	Bearing deflection see page 2	<ul style="list-style-type: none"> <li>• 10‰ from obliquity</li> <li>• <math>\frac{625}{a_1}</math> from unevenness</li> </ul>
			Insert $a_1$ in mm

#### LEGEND FORMULA SYMBOL

$F_d$	Vertical force	$\sigma_{R,d}$	Design value of the load capacity
$A_E$	Bearing area	$\sigma_{E,d}$	Design compressive stress from load
$a_1$	Length of the bearing body	$\alpha$	Bearing rotation
$b_1$	Width of the bearing body	$u$	Shear deformation of the bearing
$a_g$	Length of the sliding plate	$t$	Thickness of bearing
$b_g$	Width of the sliding plate		

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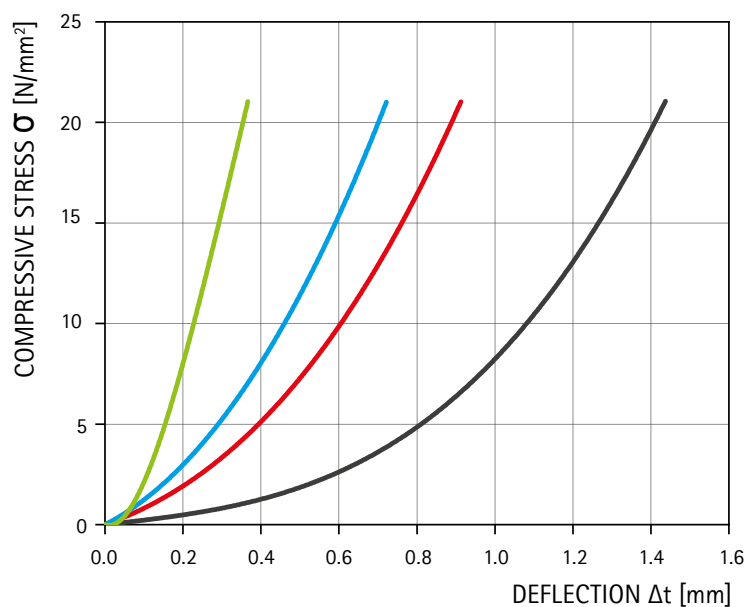
The following tables show the design value of the load capacity and the allowable angle of distortion as a function of the bearing dimensions. Intermediate values may be interpolated.

CIPARALL® SLIDING BEARING TYPE GFK		
Total bearing thickness t [mm]	14	
Bearing width a [mm]	Compressive stress $\sigma_{R,d}$ [N/mm <sup>2</sup> ]	Rotation angle max. $\alpha$ [‰]
50	21.0	40.0
60		33.3
70		28.6
80		25.0
90		22.2
100		20.0
110		18.2
120		16.7
130		15.4
140		14.3
150		13.3
160		12.5
170		11.8
180		11.1
190		10.5
200		10.0





Use in in-situ concrete: Embedding in polystyrene  
 Use in fire resistance class F90 / F120: If necessary, embedding in Ciflamon fire protection panel

## Load deflection curve

The following diagram shows the compression behaviour for different formats when used between concrete surfaces (precast elements).



### DIMENSIONS OF THE BEARING BODY

	50 mm x 100 mm
	100 mm x 100 mm
	100 mm x 200 mm
	250 mm x 250 mm

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### Design example

Given:  $F_{E,d} = 330 \text{ kN}$ , bearing rotation  $\alpha = 3.6 \text{ ‰}$ , horizontal deformation  $\pm 30 \text{ mm}$  parallel to the shorter side of the bearing body  $a_1$

Selected dimensions of the bearing body:  $a_1 = 100 \text{ mm}$ ,  $b_1 = 200 \text{ mm}$

Load capacity:

$$\sigma_{R,d} = 21.0 \text{ N/mm}^2$$

$$F_{R,d} = \sigma_{R,d} \times A_E = 21.0 \text{ N/mm}^2 \times 100 \text{ mm} \times 200 \text{ mm} = 420 \text{ kN}$$

$$F_{R,d} \geq F_{E,d} \rightarrow \text{Load capacity of the bearing is sufficient}$$

Bearing distortion from component deflection:  $\alpha = 3.6 \text{ ‰}$

Additional twisting from obliquity:  $10 \text{ ‰}$

Additional twisting from unevenness:  $625 \text{ (mm} \cdot \text{‰)} / a \text{ (mm)} = 625 / 100 = 6.25 \text{ ‰}$

Total rotation to be measured:

$$\alpha = 3.6 \text{ ‰} + 10 \text{ ‰} + 6.25 \text{ ‰} = 19.85 \text{ ‰}$$

$$\text{max. } \alpha = 2000 \text{ ‰} \times \text{mm} / a = 2000 \text{ ‰} \times \text{mm} / 100 \text{ mm} = 20 \text{ ‰}$$

$$\text{max. } \alpha \geq \alpha \rightarrow \text{Angle of twist for rotation is sufficient}$$

Horizontal deformation:

$$\pm 30 \text{ mm} \rightarrow \text{required sliding distance} = a_1 + 2 \times 30 \text{ mm} = 160 \text{ mm}$$

The sliding plate should be 10 mm larger all round due to the sliding path and bearing body dimensions

$$\rightarrow a_g = 160 \text{ mm} + 20 \text{ mm} = 180 \text{ mm}$$

$$b_g = 200 \text{ mm} + 20 \text{ mm} = 220 \text{ mm}$$

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