

Product Information

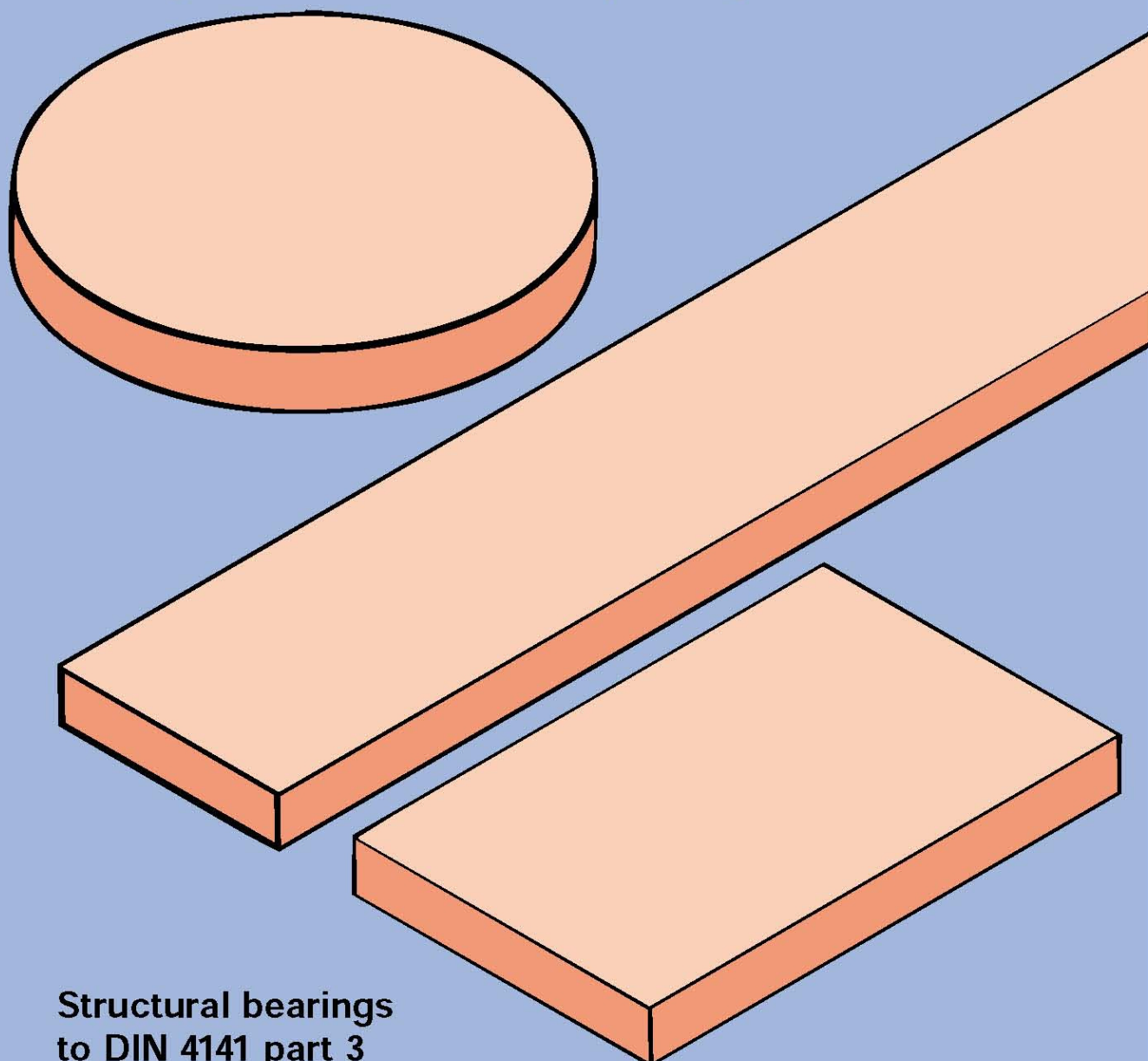
New!

15mm thickness

CALENBERG

Compact Core Bearing

Unreinforced high performance elastomer adjustment bearing. Suitable as thermal separating element.



Structural bearings
to DIN 4141 part 3

Contents

	Page		Page
Calculation Formulae.....	2	Shape Factor Table	3
Product Description.....	2	Calculation Tables 1 to 3	4-6
Functional Characteristics.....	2	How to Specify.....	7
Bearing Properties.....	2	Dimensions and Format.....	7
Fire resistance	3	Material Characteristics Table.....	8
Fields of Application.....	3	Material	8
Directions for Bearing Installation, Mechanical Preparation.....	3	Standards & Certification	8
		List of Projects Where Used	8

Product Description

The Calenberg Compact Core Bearing is a hard unreinforced and high performance elastomer adjustment bearing with smooth contact surfaces.

A significant characteristic of the bearing is the red/brown colour. This colour is for identification only.

Functional Characteristics

Due to a high material hardness the Compact Core Bearing shows a different deformation behaviour contrary to other bearings with a lower shore hardness.

This means for practical application:

- The reduction of bearing thickness under load (elastic bearing deformation) is very low due to its high Shore A hardness.
- Due to the high form stability the transverse deformation is very low. The volume displacement e.g. the semi-circular distortion at the bearing side when under load is almost negligible.
- **Compact Core Bearings do not allow any horizontal shear deformation or angle distortion because its high material hardness.**

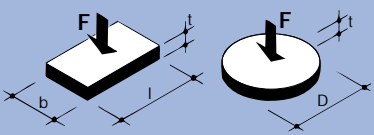
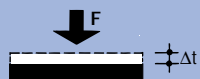
Creeping

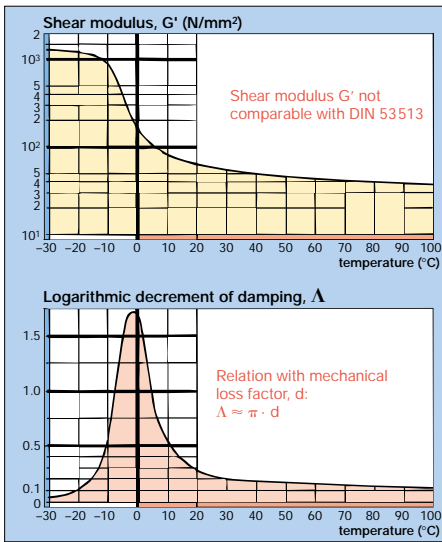
The asymptotic deformation increase under constant load is 4.75 % per decade of the initial elastic deformation. In a logarithmic time scale this means for 8 time decades an additional 38 % of the initial elastic deformation.

Calculation Formulae

Compact Core Bearing

Calculation for Bearing Class 2 to DIN 4141 Part 3

<p>(1) Permissible mean load; stress vertical to bearing surface</p> 	$\text{zul } \sigma_m = \frac{E_D}{14} \leq 30 \text{ N/mm}^2$	
	see also calculation table 1 ... 3	
<p>(2) Compression modulus (young's modulus, shape dependant at vertical load)</p>	$E_D \sim 51 \cdot S + 25 \text{ (N/mm}^2\text{)}$	
	shape factor S: see table page 3	
<p>(3) Actual reduction of height (elastic deformation) at permissible mean load</p> 	act. Δt	at bearing thickness t
	$\leq 0,35 \text{ mm}$ $\leq 0,70 \text{ mm}$ $\leq 1,40 \text{ mm}$	5 mm 10 mm 20 mm
<p>(4) Shear modulus (young's modulus at shear load)</p>	$G \sim 13 \text{ N/mm}^2$	
<p>(5) Static friction value at the load of 3 N/mm² and to roughened contact areas at a continuous shear force initiation of 10 mm/min. (contact areas roughened by 80 grade grit)</p>	$\mu_o \sim 0,7$	
l, b, D, t, Δt in mm; σ_m , E_D , G in N/mm ² ; S, μ_o without dimension		



Picture 1: Shear modulus G' and logarithmic decrement of damping Δ (temperature)

Static Friction

The static friction value under a load of 3 N/mm² was 0.72 at a continuous shear force initiation of 10 mm per min. The contact surface area was roughened with 80 grade grit.

Damping

Damping grade
 at 20 °C ... appr. 0.043
 at 50 °C ... appr. 0.027
 at 100 °C ... appr. 0.019

Fire Resistance Properties

The fire resistance properties of Compact Core Bearing have been officially proven under high load and practical conditions.

Due to this test and expert opinion the Compact Core Bearing can be classified in fire resistance class F 90 and F 120 according to DIN 4102 part 2, edition 1977.

Additional fire protection precautions are not necessary if the minimum dimensions of the bearing fulfil the demands of the 'Fire Protection Table' (Brandschutztechnische Beurteilung) No. 3799/3757-AR.

If the minimum bearing dimensions are not sufficient against fire attack the bearing has to be embedded in Ciflamon fire resistance surround with a width of at least 30 mm to fulfil the demands of F 120.

Fields of Application

Calenberg Compact Core Bearings are used mainly as thermal separation elements. They can also be used as stress and height compensating bearings (see picture 4).

Compact Core Bearings are resistant to shear and tilting. Because of their high hardness and rigidity Compact Core Bearings are not suitable for applications where lateral movements and angular distortion are to be expected.

With its hard spring properties the Compact Core Bearing is suitable for shock damping of high compression loads caused by impact impulses.

Direction for Bearing Installation, Mechanical Preparation

Precast Construction

The Compact Core Bearings are positioned without any special precautions in the middle of the building support area (application point).

For reinforced concrete the edge distance to the outer edge of the building part should be at least 2.5 cm so that the bearing is within the reinforcement area. The chamfers to the building part edges have to be considered for the calculation of the edge distance (see picture 2).

In-situ Construction

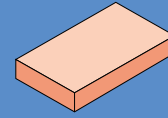
The gaps and joints around the Compact Core Bearing have to be protected with polystyrene or mineral wool so that fresh concrete will not fill any of the space around the bearing (see picture 3, in-situ construction), and restrict the bearing's function.

Shape Factor for Unreinforced Elastomer Bearings	
Bearing size	Shape Factor
<p>Rectangular bearing</p>	<ul style="list-style-type: none"> without hole: $S = \frac{l \cdot b}{2 \cdot t \cdot (l + b)}$ with hole: $S = \frac{4 \cdot l \cdot b - \pi \cdot d^2}{4 \cdot t \cdot (2 \cdot l + 2 \cdot b + \pi \cdot d)}$
<p>Rectangular strip bearing</p>	<ul style="list-style-type: none"> without hole: $S \approx \frac{b}{2 \cdot t}$
<p>Round bearing</p>	<ul style="list-style-type: none"> without hole: $S = \frac{d}{4 \cdot t}$ with hole: $S = \frac{D - d}{4 \cdot t}$



Calculation Table 1

Compact Core Bearing, 5 mm thick



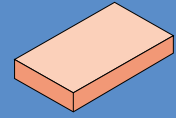
Calculation for Bearing Class 2 of DIN 4141 Part 3; Bearings, rectangular or square.

Bearing Side l, b (mm)	Load, perm. σ_m (N/mm ²)																	
	50	60	70	80	90	100	120	130	150	170	180	200	250	300	350	400	450	500
50	10.89	11.72	12.41	12.99	13.49	13.93	14.64	14.94	15.45	15.86	16.04	16.36	16.96	17.40	17.72	17.98	18.18	18.34
60	11.72	12.71	13.55	14.28	14.90	15.45	16.36	16.74	17.40	17.94	18.18	18.60	19.41	20.00	20.44	20.79	21.07	21.30
70	12.41	13.55	14.54	15.39	16.13	16.79	17.89	18.36	19.17	19.85	20.15	20.67	21.71	22.46	23.04	23.49	23.85	24.15
80	12.99	14.28	15.39	16.36	17.21	17.98	19.27	19.83	20.79	21.60	21.96	22.60	23.86	24.79	25.51	26.07	26.53	26.91
90	13.49	14.90	16.13	17.21	18.18	19.04	20.52	21.16	22.28	23.22	23.64	24.40	25.89	27.01	27.87	28.55	29.11	29.57
100	13.93	15.45	16.79	17.98	19.04	20.00	21.66	22.38	23.64	24.72	25.20	26.07	27.81	29.11				
110	14.31	15.93	17.37	18.66	19.82	20.87	22.69	23.49	24.90	26.11	26.66	27.64	29.61					
120	14.64	16.36	17.89	19.27	20.52	21.66	23.64	24.52	26.07	27.41	28.01	29.11						
130	14.94	16.74	18.36	19.83	21.16	22.38	24.52	25.46	27.16	28.62	29.28							
140	15.21	17.09	18.79	20.33	21.74	23.04	25.32	26.34	28.17	29.75								
150	15.45	17.40	19.17	20.79	22.28	23.64	26.07	27.16	29.11									
160	15.66	17.68	19.52	21.21	22.77	24.20	26.77	27.91	29.99									
170	15.86	17.94	19.85	21.60	23.22	24.72	27.41	28.62										
180	16.04	18.18	20.15	21.96	23.64	25.20	28.01	29.28										
190	16.21	18.40	20.42	22.29	24.03	25.65	28.58	29.90										
200	16.36	18.60	20.67	22.60	24.40	26.07	29.11											
210	16.50	18.79	20.91	22.89	24.74	26.46	29.60											
220	16.63	18.96	21.13	23.16	25.05	26.83												
230	16.75	19.12	21.34	23.41	25.35	27.18												
240	16.86	19.27	21.53	23.64	25.63	27.50												
250	16.96	19.41	21.71	23.86	25.89	27.81												
260	17.06	19.54	21.88	24.07	26.14	28.10												
270	17.15	19.67	22.04	24.27	26.38	28.37												
280	17.24	19.79	22.19	24.45	26.60	28.63												
290	17.32	19.90	22.33	24.63	26.81	28.87												
300	17.40	20.00	22.46	24.79	27.01	29.11												
310	17.47	20.10	22.59	24.95	27.19	29.33												
320	17.54	20.19	22.71	25.10	27.37	29.54												
330	17.60	20.28	22.82	25.24	27.55	29.74												
340	17.66	20.36	22.93	25.38	27.71	29.94												
350	17.72	20.44	23.04	25.51	27.87													
360	17.78	20.52	23.13	25.63	28.01													
370	17.83	20.59	23.23	25.75	28.16													
380	17.88	20.66	23.32	25.86	28.29													
390	17.93	20.73	23.41	25.97	28.42													
400	17.98	20.79	23.49	26.07	28.55													
420	18.06	20.91	23.64	26.27	28.79													
430	18.10	20.97	23.72	26.36	28.90													
450	18.18	21.07	23.85	26.53	29.11													
470	18.25	21.17	23.98	26.69	29.30													
480	18.28	21.21	24.04	26.77	29.39													
500	18.34	21.30	24.15	26.91	29.57													
520	18.40	21.38	24.26	27.04	29.73													
530	18.43	21.42	24.31	27.11	29.81													
550	18.48	21.49	24.41	27.23	29.96													
570	18.53	21.56	24.50	27.34														
580	18.55	21.59	24.54	27.40														
600	18.60	21.66	24.62	27.50														
650	18.70	21.80	24.81	27.73														
700	18.79	21.92	24.97	27.94														
750	18.86	22.02	25.11	28.12														
800	18.93	22.12	25.23	28.28														
900	19.04	22.28	25.45	28.55														
1000	19.13	22.41	25.62	28.77														

30.00

Calculation Table 2

Compact Core Bearing, 10 mm thick



Calculation for Bearing Class 2 of DIN 4141 Part 3; Bearings, rectangular or square.

Bearing Side l, b (mm)	Load, perm. σ_m (N/mm ²)																	
	50	60	70	80	90	100	120	130	150	170	180	200	250	300	350	400	450	500
50	6.34	6.75	7.10	7.39	7.64	7.86	8.21	8.36	8.62	8.82	8.91	9.07	9.38	9.59	9.75	9.88	9.98	10.06
60	6.75	7.25	7.67	8.03	8.34	8.62	9.07	9.26	9.59	9.86	9.98	10.19	10.60	10.89	11.11	11.29	11.43	11.54
70	7.10	7.67	8.16	8.59	8.96	9.29	9.84	10.07	10.48	10.82	10.97	11.23	11.75	12.12	12.41	12.64	12.82	12.97
80	7.39	8.03	8.59	9.07	9.50	9.88	10.53	10.81	11.29	11.69	11.87	12.19	12.82	13.29	13.65	13.93	14.16	14.35
90	7.64	8.34	8.96	9.50	9.98	10.41	11.15	11.47	12.03	12.50	12.71	13.09	13.84	14.40	14.83	15.17	15.45	15.68
100	7.86	8.62	9.29	9.88	10.41	10.89	11.72	12.08	12.71	13.25	13.49	13.93	14.80	15.45	15.95	16.36	16.69	16.96
110	8.05	8.86	9.58	10.22	10.80	11.33	12.24	12.64	13.34	13.95	14.22	14.71	15.70	16.45	17.03	17.50	17.89	18.21
120	8.21	9.07	9.84	10.53	11.15	11.72	12.71	13.15	13.93	14.60	14.90	15.45	16.55	17.40	18.06	18.60	19.04	19.41
130	8.36	9.26	10.07	10.81	11.47	12.08	13.15	13.63	14.47	15.20	15.53	16.14	17.36	18.31	19.05	19.66	20.16	20.58
140	8.50	9.44	10.29	11.06	11.76	12.41	13.55	14.06	14.98	15.77	16.13	16.79	18.13	19.17	20.00	20.67	21.23	21.71
150	8.62	9.59	10.48	11.29	12.03	12.71	13.93	14.47	15.45	16.30	16.69	17.40	18.86	20.00	20.91	21.66	22.28	22.80
160	8.72	9.73	10.66	11.50	12.28	12.99	14.28	14.85	15.89	16.80	17.21	17.98	19.56	20.79	21.79	22.60	23.28	23.86
170	8.82	9.86	10.82	11.69	12.50	13.25	14.60	15.20	16.33	17.27	17.71	18.52	20.22	21.55	22.63	23.52	24.26	24.89
180	8.91	9.98	10.97	11.87	12.71	13.49	14.90	15.53	16.69	17.71	18.18	19.04	20.85	22.28	23.44	24.40	25.20	25.89
190	9.00	10.09	11.10	12.04	12.91	13.72	15.18	15.84	17.05	18.13	18.62	19.53	21.45	22.97	24.22	25.25	26.12	26.86
200	9.07	10.19	11.23	12.19	13.09	13.93	15.45	16.14	17.40	18.52	19.04	20.00	22.02	23.64	24.97	26.07	27.01	27.81
210	9.14	10.29	11.35	12.34	13.26	14.12	15.69	16.41	17.72	18.90	19.44	20.44	22.57	24.29	25.69	26.87	27.87	28.72
220	9.21	10.37	11.46	12.47	13.42	14.31	15.93	16.67	18.03	19.25	19.82	20.87	23.10	24.90	26.39	27.64	28.70	29.61
230	9.27	10.45	11.56	12.60	13.57	14.48	16.15	16.91	18.32	19.59	20.18	21.27	23.60	25.50	27.07	28.38	29.51	
240	9.32	10.53	11.66	12.71	13.71	14.64	16.36	17.14	18.60	19.91	20.52	21.66	24.09	26.07	27.72	29.11		
250	9.38	10.60	11.75	12.82	13.84	14.80	16.55	17.36	18.86	20.22	20.85	22.02	24.55	26.62	28.35	29.81		
260	9.42	10.67	11.83	12.93	13.96	14.94	16.74	17.57	19.11	20.51	21.16	22.38	25.00	27.16	28.96			
270	9.47	10.73	11.91	13.03	14.08	15.08	16.92	17.77	19.35	20.79	21.46	22.71	25.43	27.67	29.55			
280	9.51	10.79	11.99	13.12	14.19	15.21	17.09	17.96	19.58	21.05	21.74	23.04	25.84	28.17				
290	9.55	10.84	12.06	13.21	14.30	15.33	17.25	18.14	19.79	21.31	22.02	23.35	26.24	28.64				
300	9.59	10.89	12.12	13.29	14.40	15.45	17.40	18.31	20.00	21.55	22.28	23.64	26.62	29.11				
310	9.63	10.94	12.19	13.37	14.49	15.56	17.54	18.47	20.20	21.78	22.53	23.93	26.99	29.56				
320	9.66	10.99	12.25	13.44	14.58	15.66	17.68	18.62	20.39	22.01	22.77	24.20	27.35	29.99				
330	9.69	11.03	12.30	13.51	14.67	15.76	17.81	18.77	20.57	22.22	23.00	24.47	27.69					
340	9.73	11.08	12.36	13.58	14.75	15.86	17.94	18.91	20.74	22.43	23.22	24.72	28.03					
350	9.75	11.11	12.41	13.65	14.83	15.95	18.06	19.05	20.91	22.63	23.44	24.97	28.35					
360	9.78	11.15	12.46	13.71	14.90	16.04	18.18	19.18	21.07	22.82	23.64	25.20	28.66					
370	9.81	11.19	12.51	13.77	14.97	16.12	18.29	19.31	21.23	23.00	23.84	25.43	28.96					
380	9.83	11.22	12.55	13.82	15.04	16.21	18.40	19.43	21.37	23.18	24.03	25.65	29.25					
390	9.86	11.26	12.60	13.88	15.10	16.28	18.50	19.54	21.52	23.35	24.22	25.87	29.53					
400	9.88	11.29	12.64	13.93	15.17	16.36	18.60	19.66	21.66	23.52	24.40	26.07	29.81					
420	9.92	11.35	12.71	14.03	15.29	16.50	18.79	19.87	21.92	23.83	24.74	26.46						
430	9.94	11.38	12.75	14.07	15.34	16.56	18.87	19.97	22.04	23.98	24.90	26.65						
450	9.98	11.43	12.82	14.16	15.45	16.69	19.04	20.16	22.28	24.26	25.20	27.01						
470	10.02	11.48	12.88	14.24	15.54	16.80	19.20	20.33	22.50	24.53	25.49	27.34						
480	10.03	11.50	12.91	14.28	15.59	16.86	19.27	20.42	22.60	24.65	25.63	27.50						
500	10.06	11.54	12.97	14.35	15.68	16.96	19.41	20.58	22.80	24.89	25.89	27.81						
520	10.09	11.58	13.02	14.41	15.76	17.06	19.54	20.73	22.99	25.12	26.14	28.10						
530	10.11	11.60	13.05	14.45	15.80	17.11	19.61	20.80	23.08	25.23	26.26	28.23						
550	10.13	11.64	13.10	14.51	15.87	17.20	19.73	20.94	23.25	25.44	26.49	28.50						
570	10.16	11.67	13.14	14.56	15.94	17.28	19.84	21.07	23.42	25.64	26.70	28.75						
580	10.17	11.69	13.16	14.59	15.98	17.32	19.90	21.13	23.49	25.73	26.81	28.87						
600	10.19	11.72	13.20	14.64	16.04	17.40	20.00	21.25	23.64	25.91	27.01	29.11						
650	10.24	11.79	13.30	14.76	16.18	17.57	20.24	21.52	23.98	26.33	27.46	29.64						
700	10.29	11.85	13.38	14.86	16.31	17.72	20.44	21.76	24.29	26.70	27.87							
750	10.32	11.90	13.45	14.95	16.42	17.86	20.63	21.97	24.55	27.03	28.23							
800	10.36	11.95	13.51	15.03	16.52	17.98	20.79	22.15	24.79	27.32	28.55							
900	10.41	12.03	13.62	15.17	16.69	18.18	21.07	22.48	25.20	27.83	29.11							
1000	10.46	12.10	13.70	15.28	16.83	18.34	21.30	22.74	25.54	28.25	29.57							

30.00

Calculation Table 2 a
Compact Core Bearing, 15 mm thick

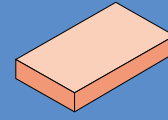
Calculation for Bearing Class 2 of DIN 4141 Part 3; Bearings, rectangular or square.

Bearing Side l, b (mm)	Load, perm. σ_m (N/mm ²)																		
	50	60	70	80	90	100	120	130	150	170	180	200	250	300	350	400	450	500	
50	3.6	3.9	4.2	4.4	4.6	4.8	5.1	5.2	5.4	5.6	5.7	5.9	6.2	6.4	6.6	6.7	6.8	6.9	
60	3.9	4.3	4.6	4.9	5.2	5.4	5.9	6.1	6.4	6.7	6.8	7.0	7.4	7.8	8.0	8.2	8.4	8.5	
70	4.2	4.6	5.0	5.4	5.8	6.1	6.6	6.9	7.3	7.7	7.9	8.2	8.8	9.2	9.6	9.9	10.1	10.3	
80	4.4	4.9	5.4	5.9	6.3	6.7	7.4	7.7	8.2	8.7	8.9	9.3	10.1	10.8	11.3	11.7	12.0	12.3	
90	4.6	5.2	5.8	6.3	6.8	7.2	8.1	8.5	9.1	9.7	10.0	10.5	11.5	12.3	13.0	13.5	13.9	14.3	
100	4.8	5.4	6.1	6.7	7.2	7.8	8.7	9.2	10.0	10.7	11.0	11.7	12.9	13.9	14.7	15.4	16.0	16.4	
110	4.9	5.7	6.4	7.0	7.7	8.3	9.4	9.9	10.8	11.7	12.1	12.8	14.3	15.5	16.5	17.4	18.0	18.6	
120	5.1	5.9	6.6	7.4	8.1	8.7	10.0	10.6	11.7	12.6	13.1	13.9	15.7	17.2	18.4	19.3	20.2	20.9	
130	5.2	6.1	6.9	7.7	8.5	9.2	10.6	11.2	12.4	13.6	14.1	15.0	17.1	18.8	20.2	21.4	22.4	23.2	
140	5.3	6.2	7.1	8.0	8.8	9.6	11.1	11.9	13.2	14.4	15.0	16.1	18.5	20.4	22.1	23.4	24.6	25.6	
150	5.4	6.4	7.3	8.2	9.1	10.0	11.7	12.4	13.9	15.3	16.0	17.2	19.8	22.1	23.9	25.5	26.9	28.1	
160	5.5	6.5	7.5	8.5	9.4	10.4	12.2	13.0	14.6	16.1	16.9	18.2	21.2	23.7	25.8	27.6	29.2		
170	5.6	6.7	7.7	8.7	9.7	10.7	12.6	13.6	15.3	16.9	17.7	19.2	22.5	25.3	27.7	29.7			
180	5.7	6.8	7.9	8.9	10.0	11.0	13.1	14.1	16.0	17.7	18.6	20.2	23.8	26.9	29.5				
190	5.8	6.9	8.0	9.1	10.3	11.4	13.5	14.6	16.6	18.5	19.4	21.1	25.1	28.4					
200	5.9	7.0	8.2	9.3	10.5	11.7	13.9	15.0	17.2	19.2	20.2	22.1	26.3						
210	5.9	7.1	8.3	9.5	10.7	11.9	14.3	15.5	17.7	19.9	21.0	23.0	27.5						
220	6.0	7.2	8.4	9.7	10.9	12.2	14.7	15.9	18.3	20.6	21.7	23.8	28.7						
230	6.1	7.3	8.6	9.8	11.2	12.5	15.1	16.3	18.8	21.3	22.4	24.7	29.9						
240	6.1	7.4	8.7	10.0	11.3	12.7	15.4	16.7	19.3	21.9	23.1	25.5							
250	6.2	7.4	8.8	10.1	11.5	12.9	15.7	17.1	19.8	22.5	23.8	26.3							
260	6.2	7.5	8.9	10.3	11.7	13.1	16.0	17.5	20.3	23.1	24.5	27.1							
270	6.3	7.6	9.0	10.4	11.9	13.4	16.3	17.8	20.8	23.7	25.1	27.9							
280	6.3	7.7	9.1	10.5	12.0	13.6	16.6	18.2	21.2	24.2	25.7	28.6							
290	6.3	7.7	9.2	10.7	12.2	13.7	16.9	18.5	21.7	24.8	26.3	29.3							
300	6.4	7.8	9.2	10.8	12.3	13.9	17.2	18.8	22.1	25.3	26.9								
310	6.4	7.8	9.3	10.9	12.5	14.1	17.4	19.1	22.5	25.8	27.4								
320	6.5	7.9	9.4	11.0	12.6	14.3	17.7	19.4	22.8	26.3	28.0								
330	6.5	7.9	9.5	11.1	12.7	14.4	17.9	19.7	23.2	26.8	28.5								
340	6.5	8.0	9.5	11.2	12.9	14.6	18.1	19.9	23.6	27.2	29.0								
350	6.6	8.0	9.6	11.3	13.0	14.7	18.4	20.2	23.9	27.7	29.5								
360	6.6	8.1	9.7	11.3	13.1	14.9	18.6	20.5	24.3	28.1									
370	6.6	8.1	9.7	11.4	13.2	15.0	18.8	20.7	24.6	28.5									
380	6.6	8.2	9.8	11.5	13.3	15.1	19.0	20.9	24.9	28.9									
390	6.7	8.2	9.8	11.6	13.4	15.3	19.2	21.2	25.2	29.3									
400	6.7	8.2	9.9	11.7	13.5	15.4	19.3	21.4	25.5	29.7									
420	6.7	8.3	10.0	11.8	13.7	15.6	19.7	21.8	26.1										
430	6.7	8.3	10.0	11.9	13.8	15.7	19.9	22.0	26.4										
450	6.8	8.4	10.1	12.0	13.9	16.0	20.2	22.4	26.9										
470	6.8	8.5	10.2	12.1	14.1	16.1	20.5	22.7	27.4										
480	6.8	8.5	10.3	12.2	14.2	16.2	20.6	22.9	27.6										
500	6.9	8.5	10.3	12.3	14.3	16.4	20.9	23.2	28.1										
520	6.9	8.6	10.4	12.4	14.4	16.6	21.2	23.5	28.5										
530	6.9	8.6	10.4	12.4	14.5	16.7	21.3	23.7	28.7										
550	6.9	8.7	10.5	12.5	14.6	16.8	21.5	24.0	29.1										
570	7.0	8.7	10.6	12.6	14.7	17.0	21.7	24.3	29.5										
580	7.0	8.7	10.6	12.6	14.8	17.0	21.9	24.4	29.6										
600	7.0	8.7	10.7	12.7	14.9	17.2	22.1	24.6											
650	7.1	8.8	10.8	12.9	15.1	17.5	22.5	25.2											
700	7.1	8.9	10.9	13.0	15.3	17.7	23.0	25.7											
750	7.1	9.0	11.0	13.2	15.5	18.0	23.3	26.2											
800	7.2	9.0	11.1	13.3	15.7	18.2	23.7	26.6											
850	7.2	9.1	11.1	13.4	15.8	18.4	24.0	27.0											
900	7.2	9.1	11.2	13.5	16.0	18.6	24.3	27.3											
950	7.3	9.2	11.3	13.6	16.1	18.7	24.5	27.6											
1000	7.3	9.2	11.3	13.7	16.2	18.9	24.8	27.9											

30.00

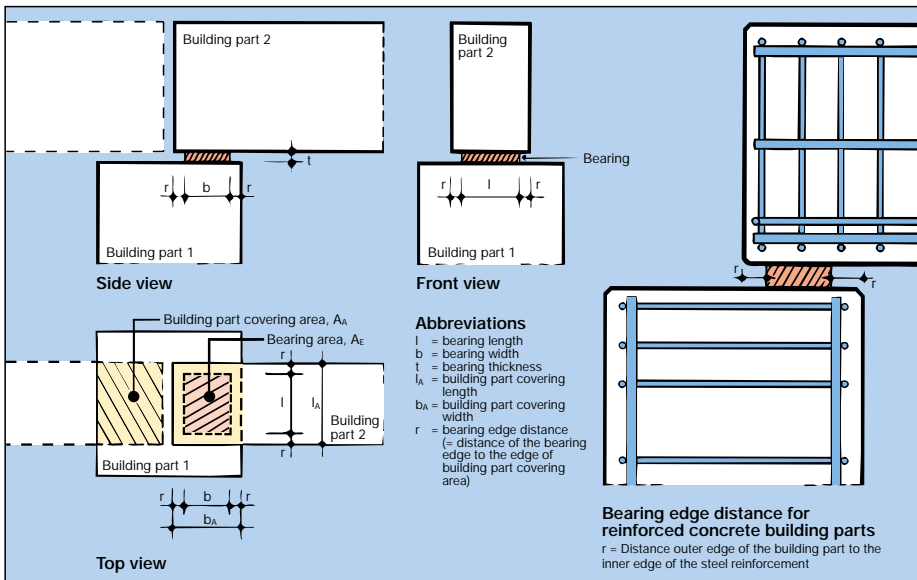
Calculation Table 3

Compact Core Bearing, 20 mm thick



Calculation for Bearing Class 2 of DIN 4141 Part 3; Bearings, rectangular or square.

Bearing Side l, b (mm)	Load, perm. σ_m (N/mm ²)																	
	100	110	120	130	140	150	170	180	200	220	230	250	300	350	400	450	500	600
100	6.34	6.56	6.75	6.93	7.10	7.25	7.52	7.64	7.86	8.05	8.13	8.29	8.62	8.87	9.07	9.24	9.38	9.59
110	6.56	6.79	7.01	7.21	7.40	7.57	7.87	8.00	8.25	8.46	8.56	8.74	9.12	9.41	9.64	9.84	10.00	10.25
120	6.75	7.01	7.25	7.47	7.67	7.86	8.19	8.34	8.62	8.86	8.97	9.17	9.59	9.92	10.19	10.41	10.60	10.89
130	6.93	7.21	7.47	7.71	7.92	8.13	8.49	8.66	8.96	9.23	9.35	9.57	10.05	10.42	10.72	10.97	11.18	11.52
140	7.10	7.40	7.67	7.92	8.16	8.38	8.78	8.96	9.29	9.58	9.71	9.96	10.48	10.89	11.23	11.51	11.75	12.12
150	7.25	7.57	7.86	8.13	8.38	8.62	9.04	9.24	9.59	9.91	10.05	10.32	10.89	11.35	11.72	12.03	12.29	12.71
160	7.39	7.72	8.03	8.32	8.59	8.84	9.29	9.50	9.88	10.22	10.38	10.67	11.29	11.79	12.19	12.54	12.82	13.29
170	7.52	7.87	8.19	8.49	8.78	9.04	9.53	9.75	10.15	10.52	10.69	11.00	11.67	12.21	12.65	13.02	13.34	13.85
180	7.64	8.00	8.34	8.66	8.96	9.24	9.75	9.98	10.41	10.80	10.98	11.32	12.03	12.61	13.09	13.49	13.84	14.40
190	7.75	8.13	8.48	8.82	9.13	9.42	9.96	10.20	10.66	11.07	11.26	11.62	12.38	13.00	13.52	13.95	14.32	14.93
200	7.86	8.25	8.62	8.96	9.29	9.59	10.15	10.41	10.89	11.33	11.53	11.90	12.71	13.38	13.93	14.40	14.80	15.45
210	7.96	8.36	8.74	9.10	9.44	9.75	10.34	10.61	11.11	11.57	11.78	12.18	13.04	13.74	14.33	14.83	15.25	15.95
220	8.05	8.46	8.86	9.23	9.58	9.91	10.52	10.80	11.33	11.80	12.03	12.44	13.34	14.09	14.71	15.24	15.70	16.45
230	8.13	8.56	8.97	9.35	9.71	10.05	10.69	10.98	11.53	12.03	12.26	12.70	13.64	14.43	15.09	15.65	16.13	16.93
240	8.21	8.66	9.07	9.47	9.84	10.19	10.85	11.15	11.72	12.24	12.48	12.94	13.93	14.75	15.45	16.04	16.55	17.40
250	8.29	8.74	9.17	9.57	9.96	10.32	11.00	11.32	11.90	12.44	12.70	13.17	14.20	15.07	15.80	16.42	16.96	17.86
260	8.36	8.83	9.26	9.68	10.07	10.45	11.15	11.47	12.08	12.64	12.90	13.39	14.47	15.37	16.14	16.79	17.36	18.31
270	8.43	8.90	9.35	9.78	10.18	10.57	11.29	11.62	12.25	12.83	13.10	13.61	14.73	15.67	16.47	17.15	17.75	18.74
280	8.50	8.98	9.44	9.87	10.29	10.68	11.42	11.76	12.41	13.01	13.29	13.81	14.98	15.95	16.79	17.50	18.13	19.17
290	8.56	9.05	9.52	9.96	10.38	10.79	11.55	11.90	12.57	13.18	13.47	14.01	15.21	16.23	17.10	17.85	18.50	19.59
300	8.62	9.12	9.59	10.05	10.48	10.89	11.67	12.03	12.71	13.34	13.64	14.20	15.45	16.50	17.40	18.18	18.86	20.00
310	8.67	9.18	9.66	10.13	10.57	10.99	11.78	12.16	12.86	13.50	13.81	14.39	15.67	16.76	17.69	18.50	19.21	20.40
320	8.72	9.24	9.73	10.20	10.66	11.09	11.90	12.28	12.99	13.66	13.97	14.57	15.89	17.01	17.98	18.82	19.56	20.79
330	8.77	9.30	9.80	10.28	10.74	11.18	12.00	12.39	13.13	13.81	14.13	14.74	16.10	17.25	18.25	19.12	19.89	21.18
340	8.82	9.35	9.86	10.35	10.82	11.26	12.11	12.50	13.25	13.95	14.28	14.91	16.30	17.49	18.52	19.42	20.22	21.55
350	8.87	9.41	9.92	10.42	10.89	11.35	12.21	12.61	13.38	14.09	14.43	15.07	16.50	17.72	18.79	19.72	20.54	21.92
360	8.91	9.46	9.98	10.48	10.97	11.43	12.30	12.71	13.49	14.22	14.57	15.22	16.69	17.95	19.04	20.00	20.85	22.28
370	8.96	9.51	10.04	10.55	11.04	11.51	12.39	12.81	13.61	14.35	14.70	15.37	16.87	18.17	19.29	20.28	21.15	22.63
380	9.00	9.55	10.09	10.61	11.10	11.58	12.48	12.91	13.72	14.48	14.83	15.52	17.05	18.38	19.53	20.55	21.45	22.97
390	9.03	9.60	10.14	10.67	11.17	11.65	12.57	13.00	13.83	14.60	14.96	15.66	17.23	18.58	19.77	20.81	21.74	23.31
400	9.07	9.64	10.19	10.72	11.23	11.72	12.65	13.09	13.93	14.71	15.09	15.80	17.40	18.79	20.00	21.07	22.02	23.64
410	9.11	9.68	10.24	10.77	11.29	11.79	12.73	13.18	14.03	14.82	15.20	15.93	17.56	18.98	20.22	21.32	22.30	23.97
420	9.14	9.72	10.29	10.83	11.35	11.85	12.81	13.26	14.12	14.93	15.32	16.06	17.72	19.17	20.44	21.57	22.57	24.29
430	9.17	9.76	10.33	10.88	11.40	11.91	12.88	13.34	14.22	15.04	15.43	16.18	17.88	19.36	20.66	21.81	22.84	24.60
440	9.21	9.80	10.37	10.92	11.46	11.97	12.95	13.42	14.31	15.14	15.54	16.30	18.03	19.54	20.87	22.05	23.10	24.90
450	9.24	9.84	10.41	10.97	11.51	12.03	13.02	13.49	14.40	15.24	15.65	16.42	18.18	19.72	21.07	22.28	23.36	25.20
460	9.27	9.87	10.45	11.02	11.56	12.09	13.09	13.57	14.48	15.34	15.75	16.54	18.32	19.89	21.27	22.50	23.60	25.50
470	9.30	9.90	10.49	11.06	11.61	12.14	13.16	13.64	14.56	15.43	15.85	16.65	18.46	20.06	21.47	22.72	23.85	25.79
480	9.32	9.94	10.53	11.10	11.66	12.19	13.22	13.71	14.64	15.52	15.95	16.76	18.60	20.22	21.66	22.94	24.09	26.07
490	9.35	9.97	10.56	11.14	11.70	12.24	13.28	13.77	14.72	15.61	16.04	16.86	18.73	20.38	21.84	23.15	24.32	26.35
500	9.38	10.00	10.60	11.18	11.75	12.29	13.34	13.84	14.80	15.70	16.13	16.96	18.86	20.54	22.02	23.36	24.55	26.62
520	9.42	10.05	10.67	11.26	11.83	12.39	13.45	13.96	14.94	15.86	16.31	17.16	19.11	20.84	22.38	23.76	25.00	27.16
530	9.45	10.08	10.70	11.29	11.87	12.43	13.51	14.02	15.01	15.94	16.39	17.26	19.23	20.98	22.55	23.95	25.22	27.41
540	9.47	10.11	10.73	11.33	11.91	12.48	13.56	14.08	15.08	16.02	16.48	17.35	19.35	21.13	22.71	24.14	25.43	27.67
550	9.49	10.13	10.76	11.36	11.95	12.52	13.61	14.14	15.14	16.10	16.56	17.44	19.46	21.26	22.88	24.33	25.64	27.92
600	9.59	10.25	10.89	11.52	12.12	12.71	13.85	14.40	15.45	16.45	16.93	17.86	20.00	21.92	23.64	25.20	26.62	29.11
650	9.68	10.35	11.01	11.65	12.28	12.89	14.06	14.62	15.71	16.75	17.26	18.23	20.48	22.50	24.34	26.00	27.52	30.00
700	9.75	10.44	11.11	11.77	12.41	13.04	14.24	14.83	15.95	17.03	17.55	18.56	20.91	23.04	24.97	26.73	28.35	
750	9.82	10.52	11.21	11.88	12.53	13.17	14.41	15.01	16.17	17.28	17.82	18.86	21.30	23.52	25.54	27.40	29.11	
800	9.88	10.59	11.29	11.97	12.64	13.29	14.55	15.17	16.36	17.50	18.05	19.13	21.66	23.96	26.07	28.01	29.81	
850	9.93	10.66	11.36	12.05	12.73	13.40	14.69	15.31	16.53	17.70	18.27	19.38	21.98	24.36	26.56	28.58	30.00	
900	9.98	10.71	11.43	12.13	12.82	13.49	14.81	15.45	16.69	17.89	18.47	19.60	22.28	24.74	27.01	29.11		
950	10.03	10.76	11.49	12.20	12.90	13.58	14.92	15.57	16.83	18.05	18.65	19.81	22.55	25.08	27.42	29.60	30.00	
1000	10.06	10.81	11.54	12.26	12.97	13.66	15.02	15.68	16.96	18.21	18.82	20.00	22.80	25.40	27.81			



Picture 2: Maximum size of the ground area of an elastomer concrete bearing (A_E) for steel reinforced construction (edge distance) in regard to the given resp. chosen building part covering area (A_A). Building parts consisting of steel or timber should have at least an edge distance of 1.5 times of the bearing thickness.

The bearings can be provided with holes, notches, slots and recesses etc. for mechanical fixing (see picture 3).

Compact Core Bearings can be fixed or adapted with common metal or woodworking tools. For the fixing of the bearings, wood and self tapping screws are suitable.

A position fixing with standard nuts and bolts is also possible.

Compact Core Bearings can also be adhered (glued) to concrete or steel surfaces. Single component silicones can also be used for temporary fixing of the bearing.

They can be used in a temperature area from $-20\text{ }^{\circ}\text{C}$ to $+70\text{ }^{\circ}\text{C}$.

Dimensions and Format

Calenberg Compact Core Bearings are delivered, numbered with position reference.

Dimensions:

- Bearing thickness: 5, 10, 20 mm
- Maximum bearing size:
 - length: 1200 mm
 - width: 1200 mm
 - diameter: 1200 mm

How to Specify

Calenberg Compact Core Bearing

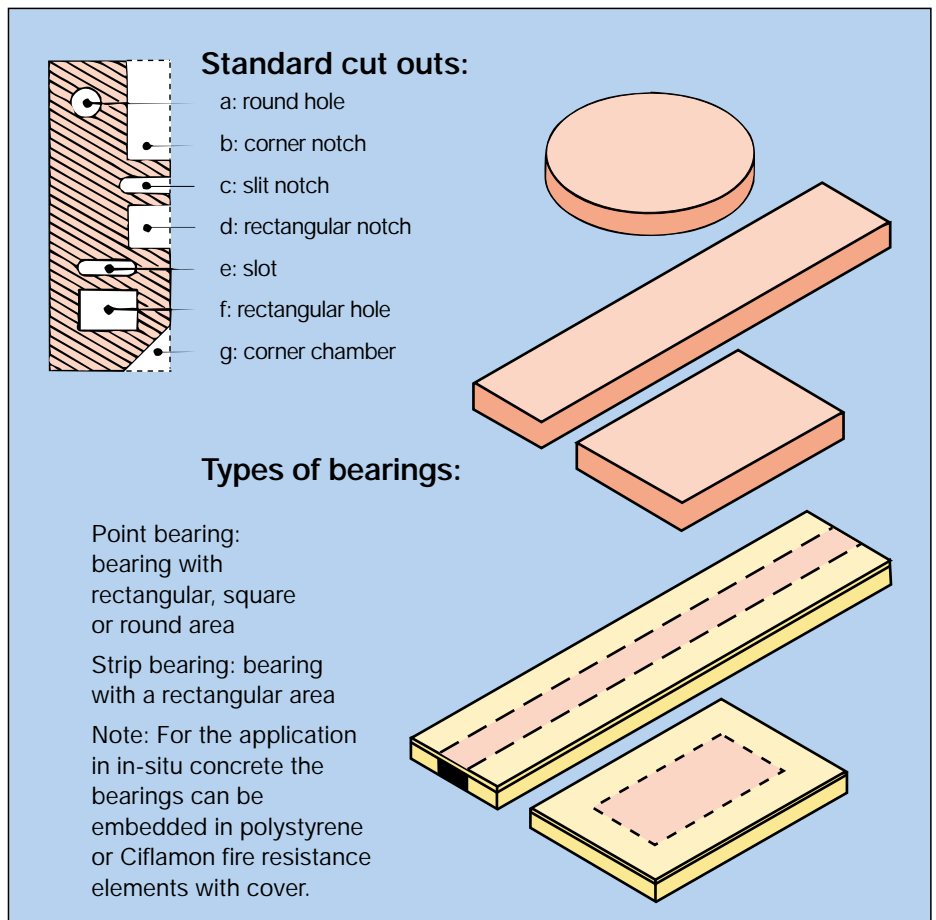
As per details and description in Calenberg technical document titled Calenberg Compact Core Bearing, Publication No. 11.4.00/02/0090.

Supply only.

Dimension: ... mm
 Quantity: ... piece or m
 Price: ... DM/m or ... Euro/m

Supplier: **Calenberg Ingenieure GmbH**

Tel. +49 51 53 94 00-0
 Fax +49 51 53 94 00-49



Picture 3: Calenberg Compact Core Bearing; bearing thickness, types of bearings and standard openings

Material Characteristics

Compact Core Bearing

No.	Characteristic	Test Norm	Approx. Values	Unit
1	Material hardness	DIN 53505	95 ± 5	Shore A
2	Tensile strength	DIN 53504	18	N/mm ²
3	Elongation at break	DIN 53504	160	%
4	Abrasion	DIN 53516	78	mm ³
5	Load at 100 % elongation		13,7	N/mm ²
6	Resistance against ozone 50 pphm, 20 % elongation, 48 h	DIN 53509	degree 0: no cracks	Rißtafel
7	Approx. freeze value T _R		- 1	°C
8	Thermal conductivity value λ	DIN 52612	0,2	W/m · K

Standards & Certification

- DIN 4141 part 3, Structural Bearing Systems for Buildings; September 1984
- Certification No. 833.1033; Stress-, shear-, and creeping tests with hard spring bearing plate „NBR-Compact Core Bearing“; Official Material Testing Institute, Institute for Material Research, University Hannover; 1984
- Fire Resistance Judgement No. 3799/7357-AR; Judgement of Calenberg Elastomer Bearings in regard of a classification in fire resistance class F 90 resp. F 120 according to DIN 4102 part 2 (edition 09/1977), Official Material Testing Institute of Civil Engineering Construction, TU Braunschweig, November 1997

List of Projects Where Used

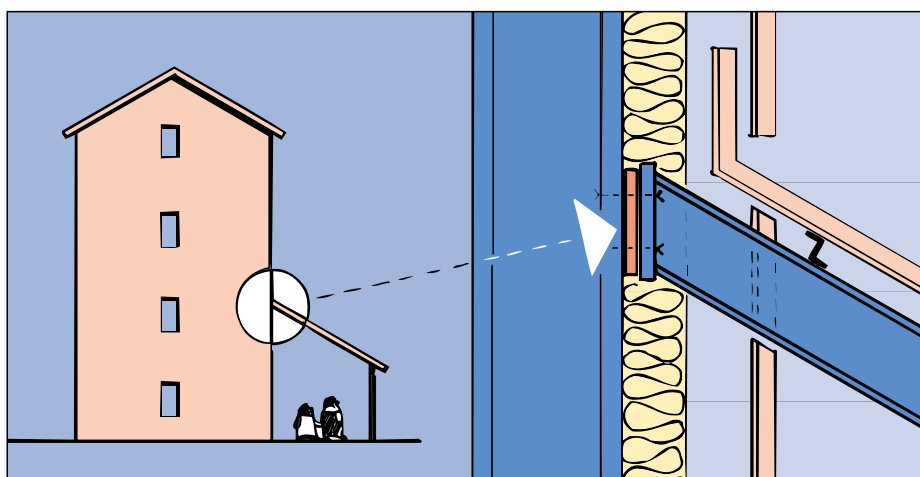
- Central Station, Munich
- Biotronik, Berlin
- Hospital, Zschopau
- Tigra, Meilingen

Material

Elastomer material based on Nitrile, colour red/brown (chemical short sign NBR).

Compact Core Bearings are resistant against oil, fuel, grease and abrasion.

A special characteristic is the bearing's heat stability. From room temperature (RT) up to 100°C the spring reaction remains almost constant.



Picture 4: Application of Calenberg Compact Core Bearings as thermal hard spring separating element in joints of heat conducting building parts, e.g. in steel and concrete construction.

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