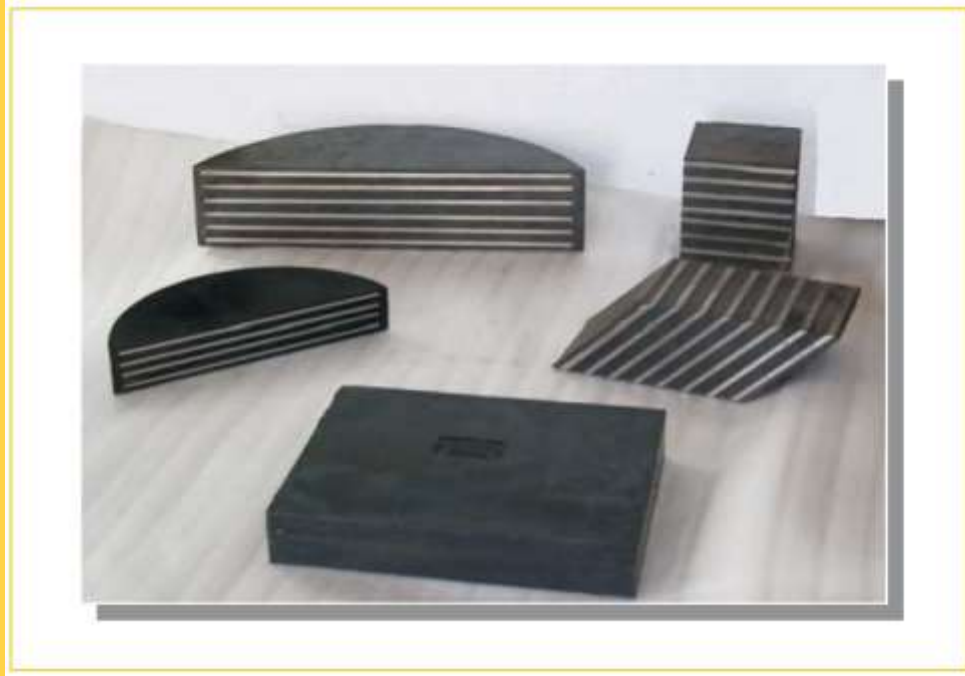


2. ELASTOMERIC STRUCTURAL BEARINGS CATALOGUE



ELASTOMERIC BEARINGS



Description of product and the application area

Elastomeric bearings are deformable elements used for the transfer of the load from one structural part to another. With comparatively low cost of production and easy installation, they are most commonly used in bridge and building construction and industrial facilities. They can be reinforced (AEL) and non-reinforced (NEL).

AEL bearings contain high-density steel sheet reinforcement, which is unified by the process of thermal vulcanization with the elastomeric material layers (elastomers). Steel sheets are protected with elastomere on all sides and thus they are protected against corrosion.

Elastomers are produced from natural rubber or synthetic chloroprene rubber, which is age-resistant against the influence of the weather conditions.

Elastomeric bearings are produced in compliance with the quality requirements set forth in the EN 1337-3 standard, as well as in the ISO-standards.

External quality control and certification is being done by IGH Institute from Zagreb and TSUS Praha.

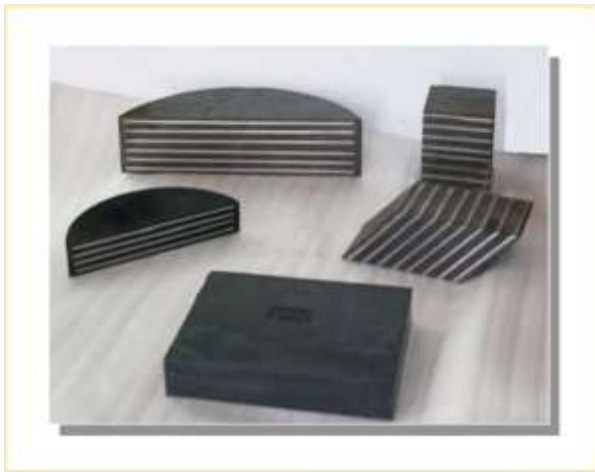
They can be used within the temperature range of - 30° C (243K) to +50° C (323K). However, short-term influence of temperatures up to +70° C (343K) can be tolerated.

Elastomeric bearings allow:

- **simultaneous shifting in two perpendicular directions**
- **simultaneous rotations in three perpendicular planes**
- **acceptance of vertical (nominal) loads**
- **acceptance of horizontal loads**

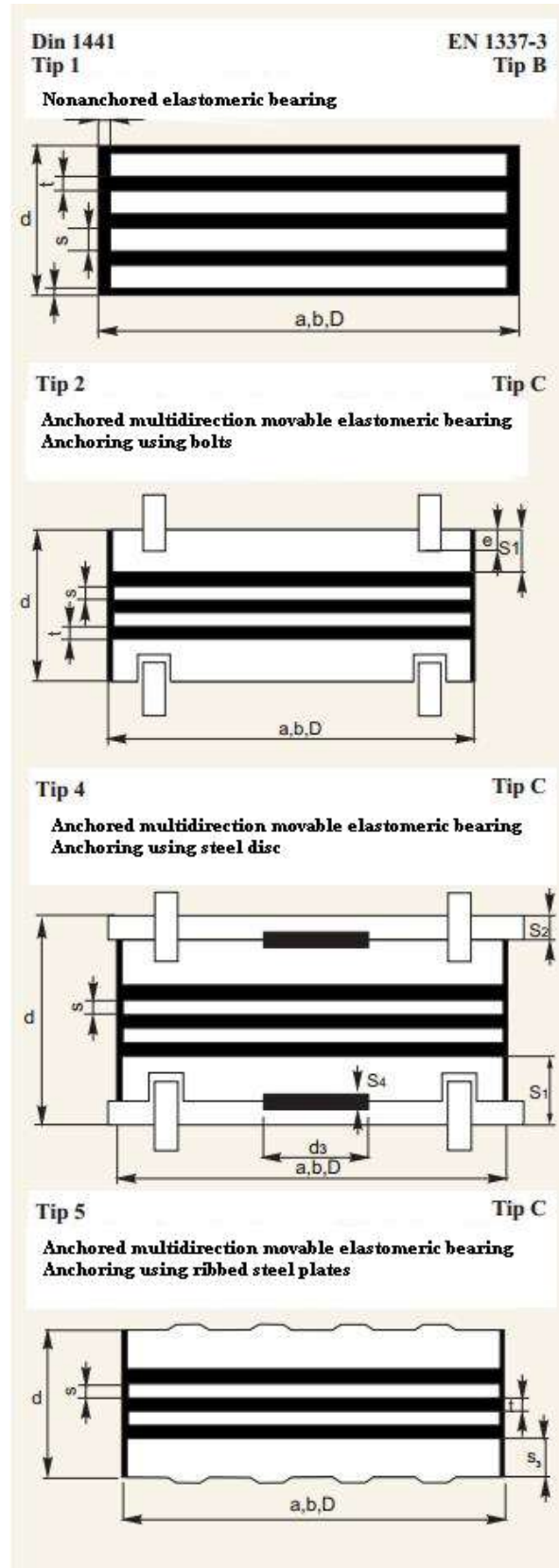
Building structural elements can generally rest on elastomeric bearings only, with no need for fixed bearings. In relation to conventional bearings, elastomeric ones can result in considerable savings due to their easy installation and low cost maintenance.

Form and dimensions



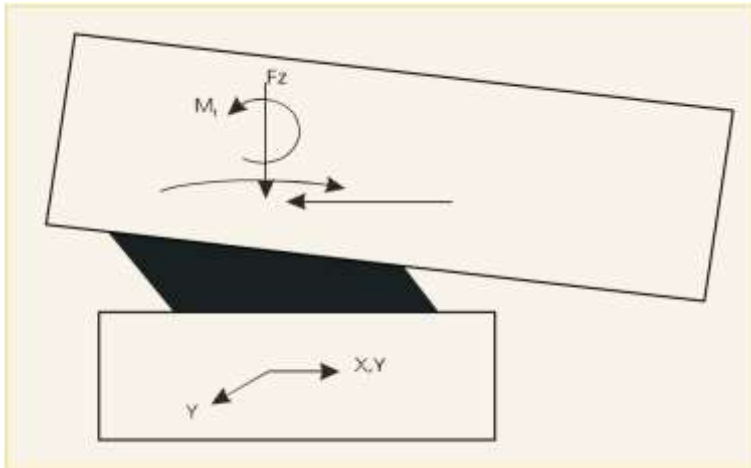
Reinforced and non-reinforced Poliriol elastomeric bearings are generally square or round. Production of other shapes is possible on request. Reinforced Poliriol bearings are produced in standard sizes shown in Table 2.

On special request they can also be produced in different sizes; in these cases, the elastomere layer and the steel sheet thickness would match the closest, by area smaller bearing, of the standard size.



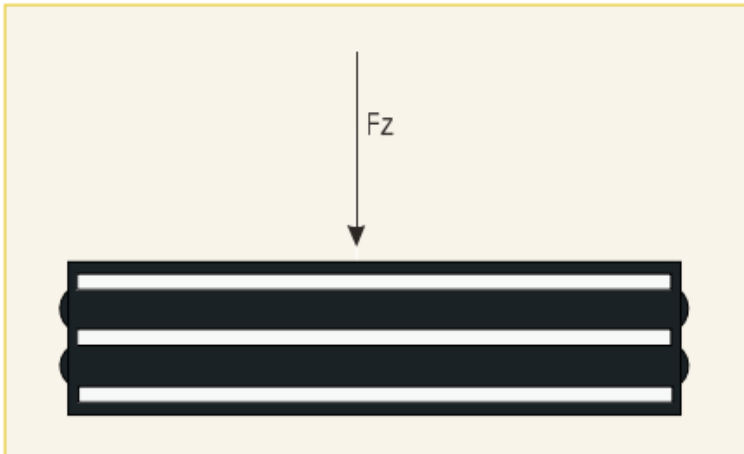
Load bearing capacity and movements

During usage, the elastomeric bearing is influenced by the normal loads (F_z), shear loads (H_x, H_y) and bending torque (M_x, M_y).



Normal allowed pressure and movements of AEL standard formats are given in Table 3.

Vertical loads



Reinforced polirol elastomeric bearings can bare vertical normal loads up to 12.000 kN, shown in Table 2. For interim values, the load is defined based on the tolerated centric pressure σ_d of the closest small bearing format

$$\sigma_d = \frac{F_z}{A}$$

Normal allowed pressure of AEL standard formats according to DIN 4141 are given in Table 3. Safety factor for short-term actions is >10 .

Lowest central pressure is determined based on the anti-skid safety.

$$\sigma_{\text{mind}} \geq 3 \text{ N/mm}^2 \text{ for bearing dimensions up to } 350 \times 400 \text{ mm,}$$

$$\sigma_{\text{mind}} \geq 5 \text{ N/mm}^2 \text{ for bearings larger than } 350 \times 400 \text{ mm}$$

or the minimal safety anti-skid coefficient.

$$\gamma_{\text{min}} = \frac{\sigma_{\text{min}} \times f_{\text{min}}}{G_{\text{min}} \times \tan \gamma_{\text{max}}} \geq 1,5$$

where:

σ_{min} - min normal pressure [MPa]

f_{min} - minimal anti-skid coefficient

For the concrete-elastomere contact:

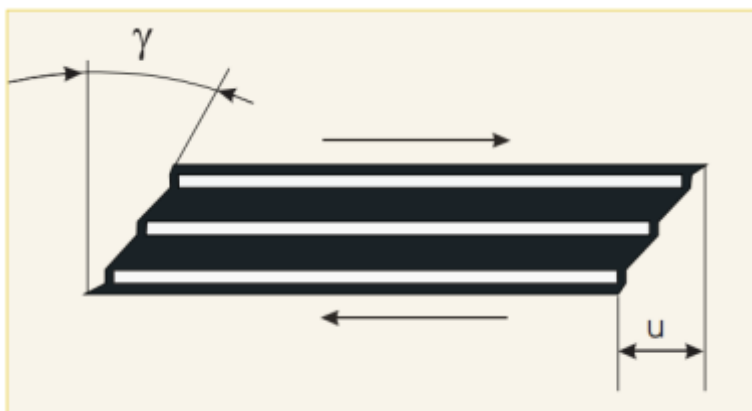
$$f_{\text{min}} = 0,2 + \frac{0,4}{\sigma_v}$$

G_{min} - min shear modulus

$\tan \gamma_{\text{max}}$ - max shear deformation

σ_v - min specific pressure

Shear loads and deformation



Allowed shear deformations are:

$$\tan \gamma_d = 0,7 \quad \text{za } 0,1a < T < 0,2a$$

$$\tan \gamma_d = 0,9 \quad \text{za } 0,2a < T < 0,3a$$

$$\tan \gamma = \frac{u}{T}$$

u = horizontal movement

T = elastomere thickness

Shear deformations in multiple directions should be added up as vectors. Building movements parallel to the bearing plane are determined in accordance with the technical rules.

Horizontal forces caused by imposed bearing shear deformations, if they are statically unfavorable, will be taken into consideration during structure calculations.

If additional shear deformations appear at low temperatures (e.g. because of movable loads), special structural check is performed. The value of $G = 2 \text{ N/mm}^2$ should be assumed for elastomeric bearings at the temperature of $+ 30^\circ\text{C}$, of 60 + 5 Shore hardness.

Horizontal forces caused by imposed shear deformations are:

$$H_1 = \tan \gamma_1 \times A \times G$$

A - bearing plan area

G - shear modulus

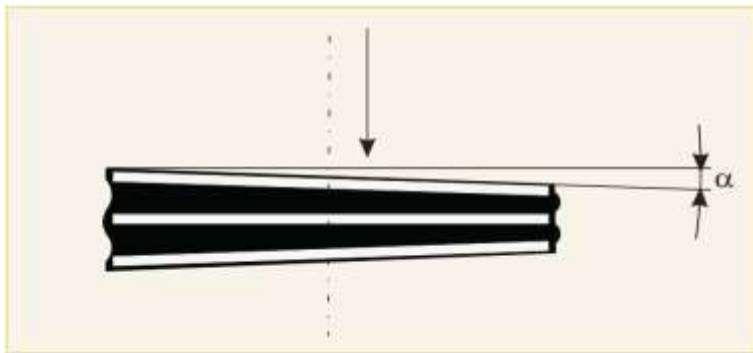
Short term shear deformations caused by external load are:

$$\tan \gamma_2 = \frac{H_2}{A \times G}$$

total shear deformations must be:

$$\tan \gamma_1 + \tan \gamma_2 < \tan \gamma_d$$

Rotation



Elastomeric bearings rotation is determined based on the structure skew. The allowed bearing rotation angles are given in Table 2, and the values per elastomere layers are given in Table 3. The allowed rotation angle determination criteria are defined based on the request that the bearings should be lifted at edges, i.e. that the excentrical force should be located within the transversal section core. For interim values, skew angle allowed for the closest larger side of the standard size bearing providing the same elastomere layer thickness is valid.

With bearing rotation, the following calculation elements must be taken into consideration in case their influence is statically unfavorable:

For square bearings:

$$M = \frac{a^5 \times b \times G \times \alpha}{50 \times t^3 \times n}$$

For round bearings:

$$M = \frac{D^6 \times G \times \alpha}{100 \times t^3 \times n}$$

where:

- a - side of bearing perpendicular to rotation angle axis for rectangular bearings
- b - side of bearing parallel to rotation angle axis for rectangular bearings
- D - diameter for round bearings
- t - elastomer layer thickness
- n - rotation angle per single elastomer layer

Design

Structures resting on elastomeric bearings should always be solved as flexible, statically undefined systems, taking into consideration deformable bearing characteristics. The bearing sizes are determined through an iterative procedure according to the sizing flow diagram.

At the beginning, a rough calculation of force distribution and structural deformities is performed. Based on this preliminary calculation, sizes of elastomeric bearings are chosen, and a detailed static and dynamic structural calculation is done. The static and dynamic structural calculation is the basis for the bearing sizing data. This data also determines and controls the following values:

- maximum pressure
- skid safety
- bearing height
- stability of the shear deformation
- reinforcement plates thickness
- bearing rotation

The above-mentioned procedure is repeated in order to choose the bearing size, and according to the complexity of the calculation for the new forces and torques.

Installation

In order to prevent unwanted prestressing of the bearings, the adjacent areas must be parallel, straight and perpendicular to the constant load resulting force. This is why there is a leveling layer foreseen between the bearing and the structural part below (e.g. 2 – 3cm thick mortar).

The bearing contact surfaces and the structure should be horizontal, i.e. inclined so that there are no shear deformations on bearings under the weight or dead load (e.g. earth material pressure).

The bearings should be positioned so that they can be easily replaced (possibility of structure lifting by hydraulic press should be allowed for).



Placement of two or more bearings consecutively in a longitudinal direction on one support is not allowed. Bearings of various sizes can not be placed next to each other because of different rigidity. Usage of Polirol elastomeric bearings together with other bearing types is allowed only if bearings of the same type are used on a single support. Welding on plate bearings with anchoring is not allowed. If the contact surface below or above the bearing is damaged, it should be reconstructed by casting so that dowels and a steel plate of min. 20 mm is placed to the side, which is being cast.

The dowels are removed after the material has hardened.

The adequate protection measures should ensure that the bearings do not come into contact with grease, dissolvent etc, and especially not with stale grease.

Elements on surfaces adjacent to the bearings should be structurally performed in such a way that they can resist the foreseen loads without any damaging or local deformations.

If during installation preset bearings are required, the presetting is always done by the bearing producer. Presetting should be performed in such a way that the bearings cannot be deformed before they are placed into function, and that they are secure during transportation.

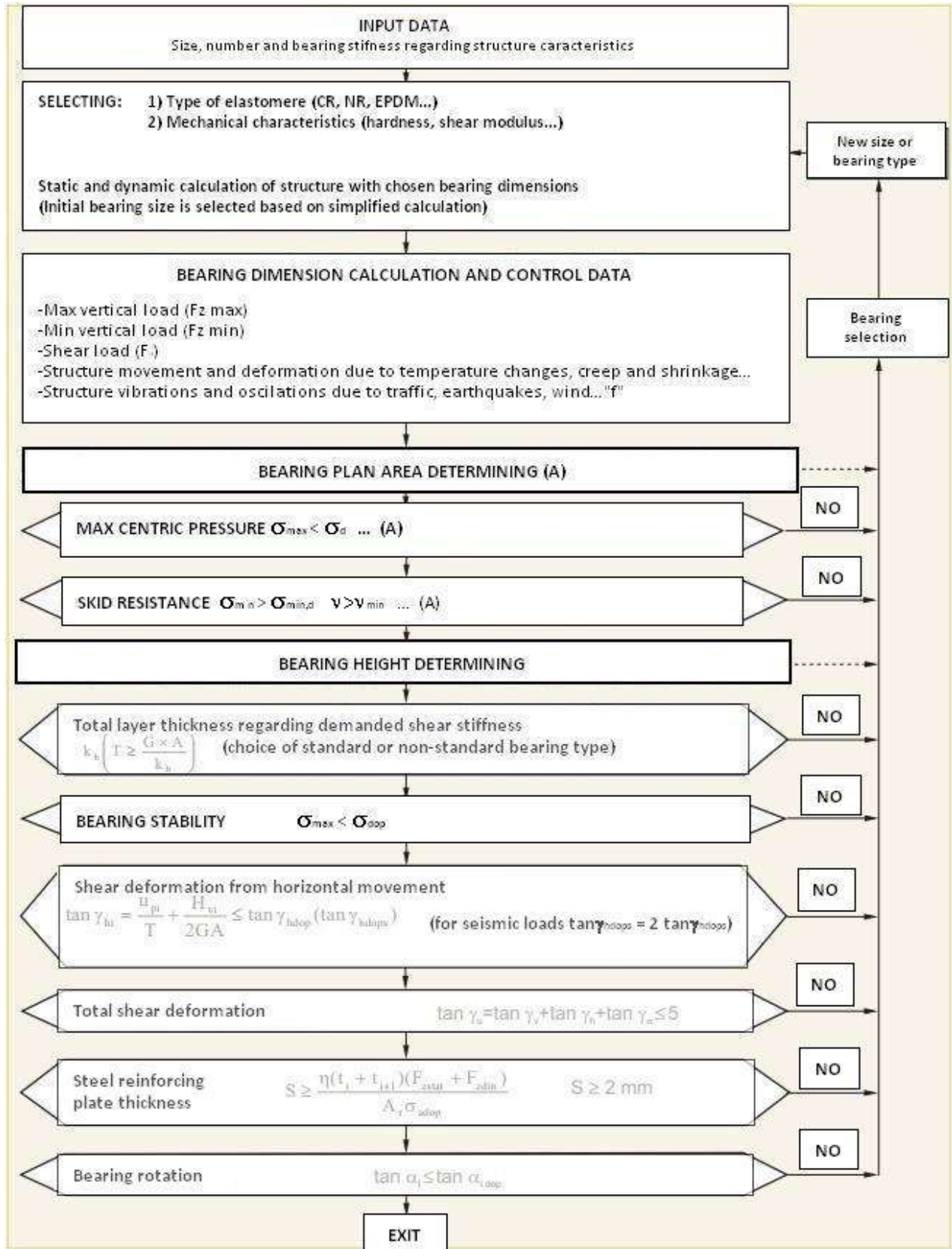
The sizes of the bearings should be such that no further presetting is required on site. Additional changes are allowed only if they are performed by and under the responsibility of the experts who represent the bearing experts.

With regard to the required presetting, the bearing parts should be interconnected so that they are in their designed place and shape at the beginning of their functional life. The bearing producer must provide sub-structures needed for that. If the bearings must be transported in parts, they should be assembled on site by the experts provided or educated by the producer.

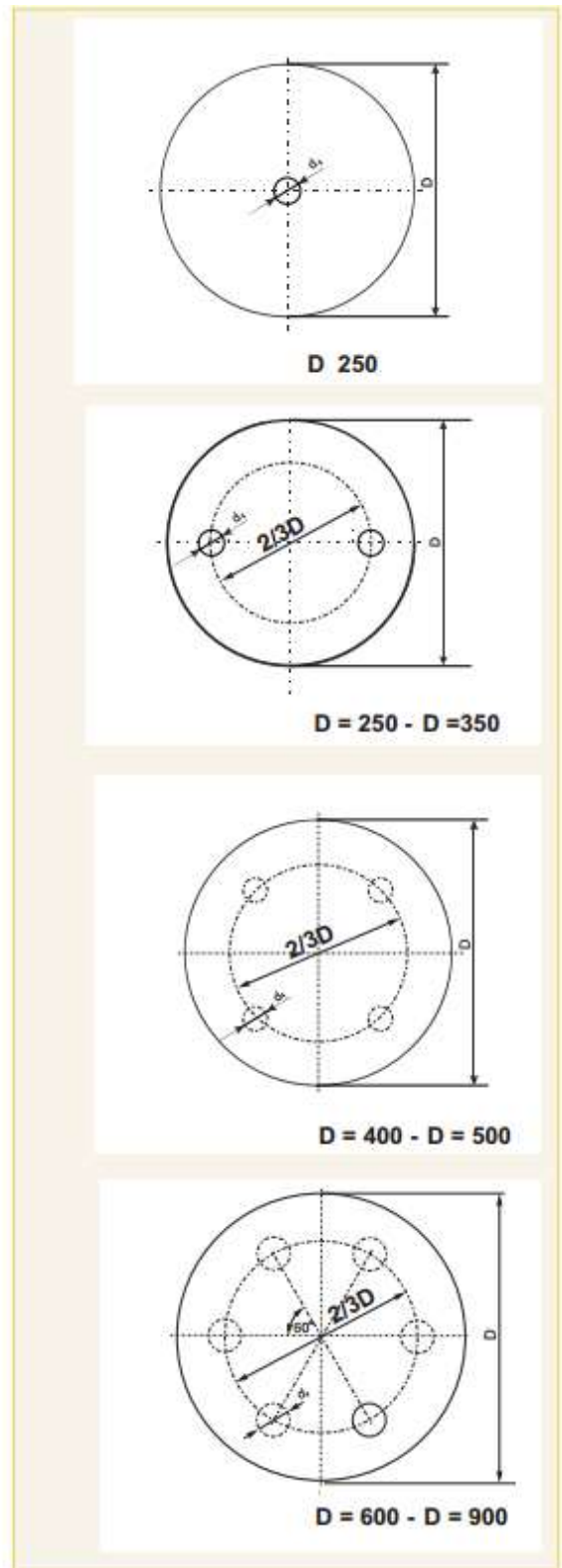
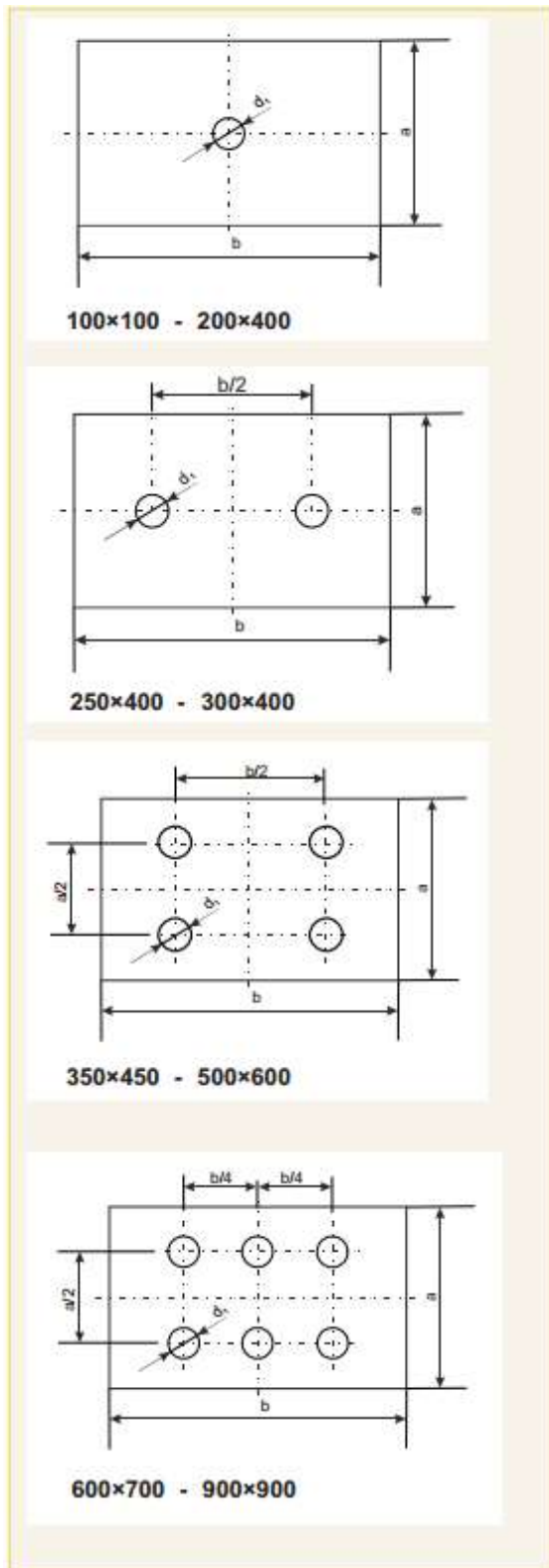
Table 1

Elastomeric bearing size	Bearing type	Mark	Unit of measurement	100x100 to 200x400 Ø200	250x400 to 300x400 Ø250 to Ø350	350x450 to 500x600 Ø400 to Ø550	Ø600 to Ø650	600x700 to 700x800 Ø700 to Ø900	800x800 to 900x900
				[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Number of anchors	2,4	-	kom	1	2	4	6	6	6
Anchor length	2,4	l	mm	120	120	150	150	150	150
Anchor diameter	2,4	d ₁	mm	20	20	30	30	40	40
Outer bearing plate	2,4	S ₁	mm	15	15	20	20	20	20
Outer anchor plate	4	S ₂	mm	15	15	20	20	20	20
Plate thickness	4	S ₄	mm	10	10	10	10	10	10
Plate diameter	4	d ₃	mm	60	80	190	380	380	380
Anchoring depth	2	e	mm	12	12	15	15	15	15
Plate thickness	5	S ₃	mm	10	10	10	10	10	10

AEI bearing sizing flow chart for static and dynamic loads







Anchoring disposition for elastomeric bearings type 2 and type 4
(type C acc. to EN 1337-3)







AEL BEARINGS

Table 2

Width x length, diameter	Permissible load	Visina ležaja				Elastomere thickness		Number of elastomere layers	Elastomere thickness	Steel plate thickness	Permissible movement		Permissible rotation angle			
		Tip 1	Tip 2	Tip 4	Tip 5	Tip 1	Tip 2,4,5				Type 1	Type 2,4,5				
a x b, D	Fz	d				T		n	t	s	V=±		n, α			
[mm]	[kN]	[mm]				[mm]		kom	[mm]	[mm]	[mm]		‰			
100 x 100 100 x 150 100 x 200	100 150 200	14				10	5	1	5	2	7,0		4,0	3,0	5,0	
		21	42	72	32	15	10	2	5	2	10,5	7,0	8,0	6,0	10,0	
		28	49	79	39	20	15	3	5	2	14,0	10,5	12,0	9,0	15,0	
		35	56	86	46	25	20	4	5	2	16,3	14,0	16,0	12,0	20,0	
		42	63	93	53	30	25	5	5	2	18,0	16,3	20,0	15,0	25,0	
		70	100	60	35	30	6	5	2	19,3	18,0	24,0	18,0	30,0		
150 x 200	300	14				10	5	1	5	2	7,0	3,5	3,0	3,0	4,0	
		21	42	72	32	15	10	2	5	2	10,5	7,0	6,0	6,0	8,0	
		28	49	79	39	20	15	3	5	2	14,0	10,5	9,0	9,0	13,0	
		35	56	86	46	25	20	4	5	2	17,5	14,0	12,0	12,0	17,0	
		42	63	93	53	30	25	5	5	2	21,0	17,5	15,0	15,0	21,0	
		49	70	100	60	35	30	6	5	2	23,3	21,0	18,0	18,0	25,0	
		56	77	107	67	40	35	7	5	2	25,3	23,3	21,0	21,0	29,0	
		63	84	114	74	45	40	8	5	2	27,0	25,3	24,0	24,0	33,0	
		91	121	81	50	45	9	5	2	28,3	27,0	27,0	27,0	37,0		
200 x 250 200 x 300 Φ 200	1000	19			28	13	8	1	8	3	9,1	5,6	3,0	2,5	4,0	4,0
		30	49	79	39	21	16	2	8	3	14,7	11,2	6,0	5,0	8,0	8,0
		41	60	90	50	29	24	3	8	3	20,3	16,8	9,0	7,5	12,0	12,0
		52	71	101	61	37	32	4	8	3	25,9	22,4	12,0	10,0	16,0	16,0
		63	82	112	72	45	40	5	8	3	30,4	28,0	15,0	12,5	20,0	20,0
		74	93	123	83	53	48	6	8	3	33,7	31,7	18,0	15,0	24,0	24,0
		85	104	134	94	61	56	7	8	3	36,3	34,7	21,0	17,5	28,0	28,0
200 x 400	1000	19	38	68	28	13	8	1	8	3	9,1	5,6	3,0	1,2	4,0	
		30	49	79	39	21	16	2	8	3	14,7	11,2	6,0	2,4	8,0	
		41	60	90	50	29	24	3	8	3	20,3	16,8	9,0	3,6	12,0	
		52	71	101	61	37	32	4	8	3	25,9	22,4	12,0	4,8	16,0	
		63	82	112	72	45	40	5	8	3	30,4	28,0	15,0	6,0	20,0	
		74	93	123	83	53	48	6	8	3	33,7	31,7	18,0	7,2	24,0	
		85	104	134	94	61	56	7	8	3	36,3	34,7	21,0	8,4	28,0	
250 X 400 Φ 250	1250 613	19	38	68	28	13	8	1	8	3	9,1	5,6	2,5	1,2	3,0	4,0
		30	49	79	39	21	16	2	8	3	14,7	11,2	5,0	2,4	5,0	8,0
		41	60	90	50	29	24	3	8	3	20,3	16,8	7,5	3,6	8,0	12,0
		52	71	101	61	37	32	4	8	3	25,9	22,4	10,0	4,8	10,0	16,0
		63	82	112	72	45	40	5	8	3	31,5	28,0	12,5	6,0	13,0	20,0
		74	93	123	83	53	48	6	8	3	36,5	33,6	15,0	7,2	16,0	24,0
		85	104	134	94	61	56	7	8	3	40,0	37,9	17,5	8,4	18,0	28,0
		96	115	145	105	69	64	8	8	3	43,1	41,2	20,0	9,6	21,0	32,0
		107	126	156	116	77	72	9	8	3	45,6	44,1	22,5	10,8	23,0	36,0

Width x length, diameter	Permissible load	Visina ležaja				Elastomere thickness		Number of elastomere layers	Elastomere thickness	Steel plate thickness	Permissible movement		Permissible rotation angle			
		Tip 1	Tip 2	Tip 4	Tip 5	Tip 1	Tip 2,4,5				Type 1	Type 2,4,5				
a x b, D	Fz	d				T		n	t	s	v=±		n, α			
[mm]	[kN]	[mm]				[mm]		kom	[mm]	[mm]	[mm]		‰			
300 X 400 Φ 300	1800 883	19	38	68	28	13	8	1	8	3	9,1	5,6	2,0	1,2	2,0	3,0
		30	49	79	39	21	16	2	8	3	14,7	11,2	4,0	2,4	4,0	6,0
		41	60	90	50	29	24	3	8	3	20,3	16,8	6,0	3,6	7,0	9,0
		52	71	101	61	37	32	4	8	3	25,9	22,4	8,0	4,8	9,0	12,0
		63	82	112	72	45	40	5	8	3	31,5	28,0	10,0	6,0	11,0	15,0
		74	93	123	83	53	48	6	8	3	37,1	33,6	12,0	7,2	13,0	18,0
		85	104	134	94	61	56	7	8	3	42,5	39,2	14,0	8,4	15,0	21,0
		96	115	145	105	69	64	8	8	3	46,2	43,9	16,0	9,6	18,0	24,0
		107	126	156	116	77	72	9	8	3	49,5	47,5	18,0	10,8	20,0	27,0
		118	137	167	127	85	80	10	8	3	52,4	50,7	20,0	12,0	22,0	30,0
129	148	178	138	93	88	11	8	3	54,9	53,4	22,0	13,2	24,0	33,0		
Φ 350	1202	24				16	11	1	11	4	11,2					4,0
		39	56	86	46	27	22	2	11	4	18,9	15,4				8,0
		54	71	101	61	38	33	3	11	4	26,6	23,1				12,0
		69	86	116	76	49	44	4	11	4	34,3	30,8				16,0
		84	101	131	91	60	55	5	11	4	42,0	38,5				20,0
		99	116	146	106	71	66	6	11	4	49,5	46,2				24,0
		114	131	161	121	82	77	7	11	4	54,6	52,4				28,0
		129	146	176	136	93	88	8	11	4	59,0	57,1				32,0
350 X 450	2360	24				16		1	11	4	11,2	0,0	2,5	2,0	3,0	
		39	66	106	46	27	22	2	11	4	18,9	15,4	5,0	4,0	6,0	
		54	81	121	61	38	33	3	11	4	26,6	23,1	7,5	6,0	9,0	
		69	96	136	76	49	44	4	11	4	34,3	30,8	10,0	8,0	12,0	
		84	111	151	91	60	55	5	11	4	42,0	38,5	12,5	10,0	15,0	
		99	126	166	106	71	66	6	11	4	49,5	46,2	15,0	12,0	19,0	
		114	141	181	121	82	77	7	11	4	54,6	52,4	17,5	14,0	22,0	
		129	156	196	136	93	88	8	11	4	59,0	57,1	20,0	16,0	26,0	
		144	171	211	151	104	99	9	11	4	62,7	61,1	22,5	18,0	29,0	
		159	186	226	166	115	110	10	11	4	65,7	64,4				
174	201	241	181	126	121	11	11	4	68,0	67,1						
400 X 500 Φ 400	3000 1885	24	51	91	31	16	11	1	11	4	11,2	7,7	2,0	1,5	2,0	3,0
		39	66	106	46	27	22	2	11	4	18,9	15,4	4,0	3,0	5,0	6,0
		54	81	121	61	38	33	3	11	4	26,6	23,1	6,0	4,5	8,0	9,0
		69	96	136	76	49	44	4	11	4	34,3	30,8	8,0	6,0	10,0	12,0
		84	111	151	91	60	55	5	11	4	42,0	38,5	10,0	7,5	13,0	15,0
		99	126	166	106	71	66	6	11	4	49,7	46,2	12,0	9,0	15,0	18,0
		114	141	181	121	82	77	7	11	4	57,0	53,9	14,0	10,5	18,0	21,0
		129	156	196	136	93	88	8	11	4	62,1	59,8	16,0	12,0	20,0	24,0
		144	171	211	151	104	99	9	11	4	66,6	64,6	18,0	13,5	22,0	27,0
		159	186	226	166	115	110	10	11	4	70,4	68,8	20,0	15,0	24,0	30,0
		201	241	181	126	121	11	11	4		72,3	22,0	17,0			

Width x length, diameter	Permissible load	Visina ležaja				Elastomere thickness		Number of elastomere layers	Elastomere thickness	Steel plate thickness	Permissible movement		Permissible rotation angle			
		Tip 1	Tip 2	Tip 4	Tip 5	Tip 1	Tip 2,4,5				Type 1	Type 2,4,5				
a x b, D	Fz	d				T		n	t	s	v=±		n, α			
[mm]	[kN]	[mm]				[mm]		kom	[mm]	[mm]	[mm]		‰			
450 X 600 Φ 450	4050 2385	24				16		1	11	4	11,2		2,0	1,2	2,0	3,0
		39	66	106	46	27	22	2	11	4	18,9	15,4	4,0	2,4	4,0	6,0
		54	81	121	61	38	33	3	11	4	26,6	23,1	6,0	3,6	7,0	9,0
		69	96	136	76	49	44	4	11	4	34,3	30,8	8,0	4,8	9,0	12,0
		84	111	151	91	60	55	5	11	4	42,0	38,5	10,0	6,0	11,0	15,0
		99	126	166	106	71	66	6	11	4	49,7	46,2	12,0	7,2	13,0	18,0
		114	141	181	121	82	77	7	11	4	57,4	53,9	14,0	8,4	15,0	21,0
		129	156	196	136	93	88	8	11	4	64,5	61,6	16,0	9,6	18,0	24,0
		144	171	211	151	104	99	9	11	4	69,6	67,3	18,0	10,8	20,0	27,0
		159	186	226	166	115	110	10	11	4	74,1	72,1	20,0	12,0	22,0	30,0
		174	201	241	181	126	121	11	11	4	78,1	76,4	22,0	13,2	24,0	33,0
		216	256	196		132	12	11	4		80,1	24,0	14,4	26,0	36,0	
500 X 600 Φ 500 Φ 550	4500 2945 3562	24				16		1	11	4	11,2	0,0	2,0	1,2	2,0	2,0
		39	66	106	46	27	22	2	11	4	18,9	15,4	4,0	2,4	4,0	4,0
		54	81	121	61	38	33	3	11	4	26,6	23,1	6,0	3,6	7,0	6,0
		69	96	136	76	49	44	4	11	4	34,3	30,8	8,0	4,8	9,0	8,0
		84	111	151	91	60	55	5	11	4	42,0	38,5	10,0	6,0	11,0	10,0
		99	126	166	106	71	66	6	11	4	49,7	46,2	12,0	7,2	13,0	12,0
		114	141	181	121	82	77	7	11	4	57,4	53,9	14,0	8,4	15,0	14,0
		129	156	196	136	93	88	8	11	4	65,1	61,6	16,0	9,6	18,0	16,0
		144	171	211	151	104	99	9	11	4	72,0	69,3	18,0	10,8	20,0	18,0
		159	186	226	166	115	110	10	11	4	77,1	74,8	20,0	12,0	22,0	20,0
		174	201	241	181	126	121	11	11	4	81,6	79,6	22,0	13,2	24,0	22,0
		189	216	256	196	137	132	12	11	4	85,8	84,0	24,0	14,4	26,0	24,0
		204	231	271	211	148	143	13	11	4	89,4	87,8	26,0	15,6	29,0	26,0
600 X 700 Φ 600 Φ 650	6300 4240 4977	30				20		1	15	5	14,0		2,0	1,5	3,0	2,0
		50	75	115	55	35	30	2	15	5	24,5	21,0	4,0	3,0	5,0	4,0
		70	95	135	75	50	45	3	15	5	35,0	31,5	6,0	4,5	8,0	6,0
		90	115	155	95	65	60	4	15	5	45,5	42,0	8,0	6,0	10,0	8,0
		110	135	175	115	80	75	5	15	5	56,0	52,5	10,0	7,5	13,0	10,0
		130	155	195	135	95	90	6	15	5	66,5	63,0	12,0	9,0	16,0	12,0
		150	175	215	155	110	105	7	15	5	77,0	73,5	14,0	10,5	18,0	14,0
		170	195	235	175	125	120	8	15	5	86,5	84,0	16,0	12,0	21,0	16,0
		190	215	255	195	140	135	9	15	5	93,3	91,1	18,0	13,5	23,0	18,0
		210	235	275	215	155	150	10	15	5	99,5	97,5	20,0	15,0	25,0	20,0
		230	255	295	235	170	165	11	15	5	104,8	103,1	22,0	16,5	28,0	22,0
		275	315	255		180	12	15	5		108,0	24,0	18,0	30,0	24,0	

Width x length, diameter	Permissible load	Visina ležaja				Elastomere thickness		Number of elastomere layers	Elastomere thickness	Steel plate thickness	Permissible movement		Permissible rotation angle			
		Tip 1	Tip 2	Tip 4	Tip 5	Tip 1	Tip 2,4,5				Type 1	Type 2,4,5				
a x b, D	Fz	d				T		n	t	s	v=±		n, α			
[mm]	[kN]	[mm]				[mm]		kom	[mm]	[mm]	[mm]		‰			
700 x 800 Φ 700 Φ 750	8400 5772 6625	30	55	95	35	20	15	1	15	5	14,0	10,5	2,0	1,2	2,0	2,0
		50	75	115	55	35	30	2	15	5	24,5	21,0	4,0	2,4	5,0	4,0
		70	95	135	75	50	45	3	15	5	35,0	31,5	6,0	3,6	7,0	6,0
		90	115	155	95	65	60	4	15	5	45,5	42,0	8,0	4,8	9,0	8,0
		110	135	175	115	80	75	5	15	5	56,0	52,5	10,0	6,0	11,0	10,0
		130	155	195	135	95	90	6	15	5	66,5	63,0	12,0	7,2	13,0	12,0
		150	175	215	155	110	105	7	15	5	77,0	73,5	14,0	8,4	15,0	14,0
		170	195	235	175	125	120	8	15	5	87,5	84,0	16,0	9,6	18,0	16,0
		190	215	255	195	140	135	9	15	5	98,0	94,5	18,0	10,8	21,0	18,0
		210	235	275	215	155	150	10	15	5	105,2	102,9	20,0	12,0	23,0	20,0
		230	255	295	235	170	165	11	15	5	111,7	109,6	22,0	13,2	25,0	22,0
		250	275	315	255	185	180	12	15	5	117,6	115,7	24,0	14,4	28,0	24,0
		270	295	335	275	200	195	13	15	5	122,9	121,2	26,0	15,6	30,0	26,0
		315	355	295		210	14	15	5		126,0	28,0	16,8	32,0	28,0	
800 x 800 Φ 800	9600 7536	33				23		1	18	5	16,1		2,0	2,0	3,0	2,0
		56	81	121	61	41	36	2	18	5	28,7	25,2	4,0	4,0	6,0	4,0
		79	104	144	84	59	54	3	18	5	41,3	37,8	6,0	6,0	8,0	6,0
		102	127	167	107	77	72	4	18	5	53,9	50,4	8,0	8,0	11,0	8,0
		125	150	190	130	95	90	5	18	5	66,5	63,0	10,0	10,0	14,0	10,0
		148	173	213	153	113	108	6	18	5	79,1	75,6	12,0	12,0	17,0	12,0
		171	196	236	176	131	126	7	18	5	91,7	88,2	14,0	14,0	20,0	14,0
		194	219	259	199	149	144	8	18	5	104,3	100,8	16,0	16,0	22,0	16,0
		217	242	282	222	167	162	9	18	5	115,4	113,0	18,0	18,0	25,0	18,0
		240	265	305	245	185	180	10	18	5	123,7	121,5	20,0	20,0	28,0	20,0
		263	288	328	268	203	198	11	18	5	131,2	129,2	22,0	22,0	31,0	22,0
		286	311	351	291	221	216	12	18	5	137,8	136,1	24,0	24,0	34,0	24,0
309	334	374	314	239	234	13	18	5	143,7	142,2	26,0	26,0	36,0	26,0		
900 x 900 Φ 900 Φ 850	12150 8538 8507	33				23		1	18	5	16,1	0,0	1,5	1,5	2,0	2,0
		56	81	121	61	41	36	2	18	5	28,7	25,2	3,0	3,0	4,0	3,0
		79	104	144	84	59	54	3	18	5	41,3	37,8	4,5	4,5	6,0	5,0
		102	127	167	107	77	72	4	18	5	53,9	50,4	6,0	6,0	8,0	6,0
		125	150	190	130	95	90	5	18	5	66,5	63,0	7,5	7,5	11,0	8,0
		148	173	213	153	113	108	6	18	5	79,1	75,6	9,0	9,0	13,0	9,0
		171	196	236	176	131	126	7	18	5	91,7	88,2	10,5	10,5	15,0	11,0
		194	219	259	199	149	144	8	18	5	104,3	100,8	12,0	12,0	17,0	12,0
		217	242	282	222	167	162	9	18	5	116,9	113,4	13,5	13,5	19,0	14,0
		240	265	305	245	185	180	10	18	5	128,5	126,0	15,0	15,0	21,0	15,0
		263	288	328	268	203	198	11	18	5	136,9	134,6	16,5	16,5	23,0	17,0
		286	311	351	291	221	216	12	18	5	144,6	142,6	18,0	18,0	25,0	18,0
		309	334	374	314	239	234	13	18	5	151,6	149,8	19,5	19,5	27,0	20,0
		332	357	397	337	257	252	14	18	5	157,9	156,2	21,0	21,0	29,0	21,0
355	380	420	360	275	270	15	18	5	163,5	162,0	22,5	22,5	32,0	23,0		

Permissible pressure and rotation angle

Table 3

Base area	Elastomere layer thickness	Permissible mean pressure	Permissible rotation angle per elastomere layer		
			Paralel to larger edge of base	Paralel to smaller edge of base	Diagonally with respect to the base edges
[mm]	[mm]	[N/mm ²]	[arc.]	[arc.]	[arc.]
100x100	5	10,0	0,0040	0,0040	0,0057
100x150	5	10,0	0,0040	0,0030	0,0050
150x200	5	10,0	0,0030	0,0030	0,0042
200x250	8	12,5	0,0030	0,0025	0,0039
200x300	8	12,5	0,0030	0,0020	0,0036
200x400	8	12,5	0,0030	0,0012	0,0032
250x400	8	12,5	0,0025	0,0012	0,0028
300x400	8	15,0	0,0020	0,0012	0,0023
350x450	11	15,0	0,0025	0,0020	0,0032
400x500	11	15,0	0,0020	0,0015	0,0025
450x600	11	15,0	0,0020	0,0012	0,0023
500x600	11	15,0	0,0020	0,0012	0,0023
600x700	15	15,0	0,0020	0,0015	0,0025
700x800	15	15,0	0,0020	0,0012	0,0023
800x800	18	15,0	0,0020	0,0020	0,0028
900x900	18	15,0	0,0015	0,0015	0,0021
Ø200	8	10,0		0,0040	
Ø250	8	12,5		0,0040	
Ø300	8	12,5		0,0030	
Ø350	11	12,5		0,0040	
Ø400	11	15,0		0,0030	
Ø450	11	15,0		0,0030	
Ø500	11	15,0		0,0020	
Ø600	15	15,0		0,0020	
Ø700	15	15,0		0,0020	
Ø800	18	15,0		0,0020	
Ø900	18	15,0		0,0015	



AEL WITH MOVEMENT RESTRAINT DEVICE

Fixed in the longitudinal direction AEL-a (type 1.2 acc. to EN 1337-1)

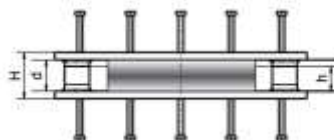
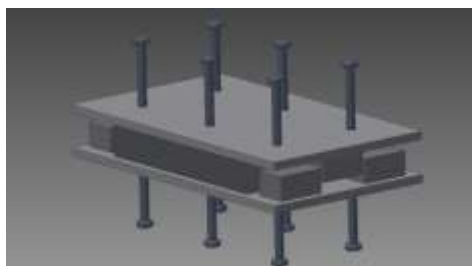


Table 4

Bearing dimensions		Permissible horizontal load H_{dozv}	Restraining device dimensions			Number of anchors $\Phi 22$
$a \times b$, Φ	d		Anchor plate dimension $a_1 \times b_1$	Guide dimension $c \times l$		
mm	mm	kN	mm	mm	mm	pcs
150 x 200	21	172	190 x 345	40 x 50	15	4
	28	200	190 x 350	40 x 50	20	
	35	180	190 x 355	40 x 50	25	
	42	160	190 x 365	40 x 50	30	
	49	144	190 x 370	40 x 50	35	
	56	132	190 x 375	40 x 50	40	
	63	140	190 x 395	50 x 50	45	
200 x 300	30	230	240 x 470	50 x 60	25	6
	41	264	240 x 485	50 x 60	30	
	52	228	240 x 495	50 x 60	40	
	63	204	240 x 505	50 x 60	45	
	74	204	240 x 530	60 x 60	55	
	85	182	240 x 535	60 x 60	65	
300 x 400	30	289	340 x 590	60 x 90	25	6
	41	319	340 x 605	60 x 90	30	
	52	388	340 x 615	60 x 90	40	
	63	35	340 x 625	60 x 90	45	
	74	318	340 x 635	60 x 90	55	
	85	288	340 x 645	60 x 90	65	
	96	264	340 x 655	60 x 90	70	
	107	242	340 x 660	60 x 90	80	
	118	224	340 x 665	60 x 90	85	

Bearing dimensions		Permissible horizontal load H_{dozv}	Restraining device dimensions			Number of anchors
$a \times b, \Phi$	d		Anchor plate dimension $a_1 \times b_1$	Guide dimension $c \times l$ h		$\Phi 22$ n
mm	mm	kN	mm	mm	mm	pcs
400 x 500	54	576	440 x 755	80 x 120	40	10
	69	518	440 x 770	80 x 120	50	
	84	468	440 x 785	80 x 120	60	
	99	422	440 x 800	80 x 120	75	
	114	384	440 x 815	80 x 120	85	
	129	350	440 x 825	80 x 120	95	
	144	322	440 x 835	80 x 120	105	
	159	296	440 x 845	80 x 120	115	
500 x 600	54	580	540 x 855	80 x 150	40	12
	69	642	540 x 870	80 x 150	50	
	84	588	540 x 885	80 x 150	60	
	99	538	540 x 900	80 x 150	75	
	114	494	540 x 915	80 x 150	85	
	129	454	540 x 935	80 x 150	95	
	144	420	540 x 945	80 x 150	105	
	159	388	540 x 955	80 x 150	115	
	174	512	540 x 1005	100 x 150	125	
	189	386	540 x 1015	100 x 150	135	
	204	362	540 x 1020	100 x 150	145	
600 x 700	70	738	640 x 970	80 x 175	50	12
	90	666	640 x 995	80 x 175	65	
	110	600	640 x 1015	80 x 175	80	
	130	540	640 x 1035	80 x 175	95	
	150	504	640 x 1055	80 x 175	110	
	170	504	640 x 1115	100 x 175	125	
	190	462	640 x 1130	100 x 175	135	
	210	628	640 x 1140	100 x 175	150	
	230	396	640 x 1150	100 x 175	165	
	$\Phi 900$ 900 x 900	79	1078	940 x 1225	100 x 250	
102		994	940 x 1250	100 x 250	75	
125		910	940 x 1275	100 x 250	90	
148		834	940 x 1300	100 x 250	110	
171		766	940 x 1325	100 x 250	125	
194		704	940 x 1350	100 x 250	140	
217		802	940 x 1375	100 x 250	155	
240		746	940 x 1400	100 x 250	175	
263		698	940 x 1415	100 x 250	190	
286		654	940 x 1430	100 x 250	205	
309		614	940 x 1445	100 x 250	220	
332		598	940 x 1460	100 x 250	240	

AEL WITH MOVEMENT RESTRAINT DEVICE
Fixed in transversal direction AEL-b (type 1.2 acc. to EN 1337-1)

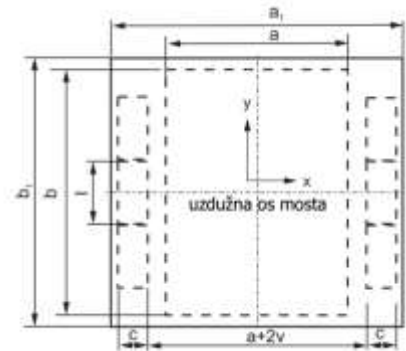
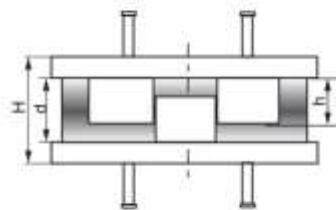
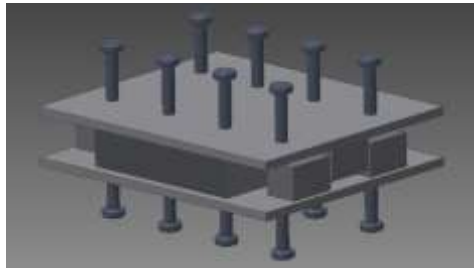


Table 5

Bearing dimensions		Permissible horizontal load H_{dozv}	Restraining device dimensions			Number of anchors $\Phi 22$ n
a x b, Φ	d		Anchor plate dimension $a_1 \times b_1$	Guide dimension c x l h		
mm	mm	kN	mm	mm	mm	pcs
150 x 200	21	172	295 x 240	40 x 50	15	4
	28	200	300 x 240	40 x 50	20	
	35	180	305 x 240	40 x 50	25	
	42	160	315 x 240	40 x 50	30	
	49	144	320 x 240	40 x 50	35	
	56	132	325 x 240	40 x 50	40	
	63	140	345 x 240	50 x 50	45	
200 x 300	30	230	370 x 340	50 x 60	25	6
	41	264	385 x 340	50 x 60	30	
	52	228	395 x 340	50 x 60	40	
	63	204	405 x 340	50 x 60	45	
	74	204	430 x 340	60 x 60	55	
300 x 400	85	182	435 x 340	60 x 60	65	6
	30	289	490 x 440	60 x 90	25	
	41	319	505 x 440	60 x 90	30	
	52	388	515 x 440	60 x 90	40	
	63	35	525 x 440	60 x 90	45	
	74	318	535 x 440	60 x 90	55	
	85	288	545 x 440	60 x 90	65	
	96	264	555 x 440	60 x 90	70	
107	242	560 x 440	60 x 90	80		
118	224	565 x 440	60 x 90	85		

Bearing dimensions		Permissible horizontal load	Restraining device dimensions			Number of anchors
a x b, Φ	d		H_{dozv}	Anchor plate dimension	Guide dimension	
mm	mm	kN		$a_1 \times b_1$	c x l	h
mm	mm	kN	mm	mm	mm	pcs
400 x 500	54	576	655 x 540	80 x 120	40	10
	69	518	670 x 540	80 x 120	50	
	84	468	685 x 540	80 x 120	60	
	99	422	700 x 540	80 x 120	75	
	114	384	715 x 540	80 x 120	85	
	129	350	725 x 540	80 x 120	95	
	144	322	735 x 540	80 x 120	105	
	159	296	745 x 540	80 x 120	115	
500 x 600	54	580	755 x 640	80 x 150	40	12
	69	642	770 x 640	80 x 150	50	
	84	588	785 x 640	80 x 150	60	
	99	538	800 x 640	80 x 150	75	
	114	494	815 x 640	80 x 150	85	
	129	454	835 x 640	80 x 150	95	
	144	420	845 x 640	80 x 150	105	
	159	388	855 x 640	80 x 150	115	
	174	512	905 x 640	100 x 150	125	
	189	386	915 x 640	100 x 150	135	
	204	362	920 x 640	100 x 150	145	
600 x 700	70	738	870 x 740	80 x 175	50	12
	90	666	895 x 740	80 x 175	65	
	110	600	915 x 740	80 x 175	80	
	130	540	935 x 740	80 x 175	95	
	150	504	955 x 740	80 x 175	110	
	170	504	1015 x 740	100 x 175	125	
	190	462	1030 x 740	100 x 175	135	
	210	628	1040 x 740	100 x 175	150	
	230	396	1050 x 740	100 x 175	165	
$\Phi 900$ 900 x 900	79	1078	1225 x 940	100 x 250	60	16
	102	994	1250 x 940	100 x 250	75	
	125	910	1275 x 940	100 x 250	90	
	148	834	1300 x 940	100 x 250	110	
	171	766	1325 x 940	100 x 250	125	
	194	704	1350 x 940	100 x 250	140	
	217	802	1375 x 940	100 x 250	155	
	240	746	1400 x 940	100 x 250	175	
	263	698	1415 x 940	100 x 250	190	
	286	654	1430 x 940	100 x 250	205	
	309	614	1445 x 940	100 x 250	220	
	332	598	1460 x 940	100 x 250	240	

AEL WITH MOVEMENT RESTRAINT DEVICE

Fixed in longitudinal and transversal direction AEL-f (type 1.6 acc.to EN 1337-1)

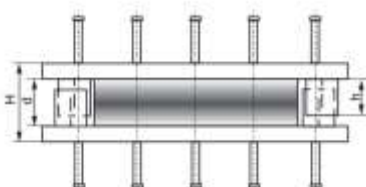


Table 6

Bearing dimensions		Permissible horizontal load	Restraining device dimensions			Number of anchors
a x b, Φ	d		Anchor plate dimensions	Guide dimensions		
mm	mm	H_{dozv} kN		$a_1 \times b_1$ mm	c mm	h mm
150 x 200	21	172	190 x 310	30	15	4
	28	200	190 x 310	30	20	
	35	180	190 x 310	30	25	
	42	160	190 x 310	30	30	
	49	144	190 x 310	30	35	
	56	132	190 x 310	30	40	
	63	140	190 x 310	30	45	
200 x 300	30	230	240 x 430	40	25	6
	41	264	240 x 430	40	30	
	52	228	240 x 430	40	40	
	63	204	240 x 430	40	45	
	74	204	240 x 430	40	55	
	85	182	240 x 430	40	65	
300 x 400	30	289	340 x 570	60	25	6
	41	319	340 x 570	60	30	
	52	388	340 x 570	60	40	
	63	35	340 x 570	60	45	
	74	318	340 x 570	60	55	
	85	288	340 x 570	60	65	
	96	264	340 x 570	60	70	
	107	242	340 x 570	60	80	
	118	224	340 x 570	60	85	

Bearing dimensions		Permissible horizontal load	Restraining device dimensions			Number of anchors
a x b, Φ	d		Anchor plate dimensions	Guide dimensions		
mm	mm	H_{dozv} kN		$a_1 \times b_1$ mm	c mm	h mm
400 x 500	54	576	440 x 710	80	40	10
	69	518	440 x 710	80	50	
	84	468	440 x 710	80	60	
	99	422	440 x 710	80	75	
	114	384	440 x 710	80	85	
	129	350	440 x 710	80	95	
	144	322	440 x 710	80	105	
	159	296	440 x 710	80	115	
500 x 600	54	580	540 x 850	100	40	12
	69	642	540 x 850	100	50	
	84	588	540 x 850	100	60	
	99	538	540 x 850	100	75	
	114	494	540 x 850	100	85	
	129	454	540 x 850	100	95	
	144	420	540 x 850	100	105	
	159	388	540 x 850	100	115	
	174	512	540 x 850	100	125	
	189	386	540 x 850	100	135	
204	362	540 x 850	100	145		
600 x 700	70	738	640 x 990	120	50	12
	90	666	640 x 990	120	65	
	110	600	640 x 990	120	80	
	130	540	640 x 990	120	95	
	150	504	640 x 990	120	110	
	170	504	640 x 990	120	125	
	190	462	640 x 990	120	135	
	210	628	640 x 990	120	150	
	230	396	640 x 990	120	165	
$\Phi 900$ 900 x 900	79	1078	940 x 1310	180	60	16
	102	994	940 x 1310	180	75	
	125	910	940 x 1310	180	90	
	148	834	940 x 1310	180	110	
	171	766	940 x 1310	180	125	
	194	704	940 x 1310	180	140	
	217	802	940 x 1310	180	155	
	240	746	940 x 1310	180	175	
	263	698	940 x 1310	180	190	
	286	654	940 x 1310	180	205	
	309	614	940 x 1310	180	220	
	332	598	940 x 1310	180	240	

