

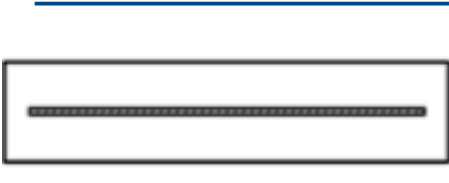


**REINFORCED ELASTOMERIC
BEARINGS TYPE ESAFLON**

REINFORCED ELASTOMERIC BEARINGS

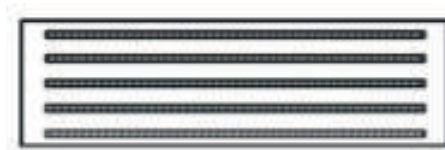
“**ESAFLON**” type devices are structural bearings, produced through a vulcanisation process and made by an alternation of layers of elastomer and metal plates. They are designed to take account of sideshifting movements in any horizontal direction and rotational movements around any axis by elastic deformation. The reinforcement sheets rigidify considerably under vertical force, but do not significantly alter their behaviour under horizontal force.

TYPE A



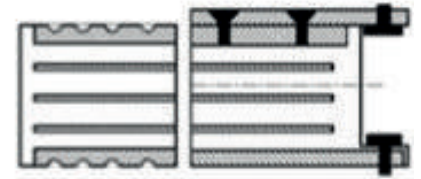
Laminated bearing fully covered with elastomer comprising only one steel reinforcing plate.

TYPE B



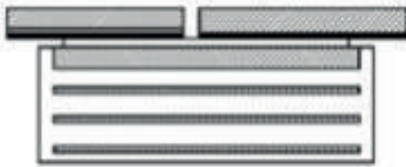
Laminated bearing fully covered with elastomer comprising at least two steel reinforcing plates.

TYPE C



Laminated bearing with outer steel plates (profiled or allowing fixing).
NOTE The sketch shows examples of a few fixing methods; other methods can be used.

TYPE E



Type C with one outer plate bonded to the elastomer and PTFE sheet recessed in the steel.

TYPE F



Pad rubber bearing without laminated steel.



ESAFLON bearings are designed and manufactured according to EN 1337

MATERIALS

ELEMENT	MATERIALS	STANDARD
ELASTOMER	ELASTOMER 50 SH A3	EN 1337 / ASTM
VULCANIZED STEEL PLATES	S275	EN 10025-2 / EN 10025-5
OUTER STEEL PLATES	S275	EN 10025-2 / EN 10025-5
ANCHORS	C45 BON / 39NICRMO3	EN 10083

KEY TO LABEL:



ESA AxBxH : Elastomeric bearing ESAFLON type with the following dimensions:

A = Dimension of the elastomer in longitudinal direction

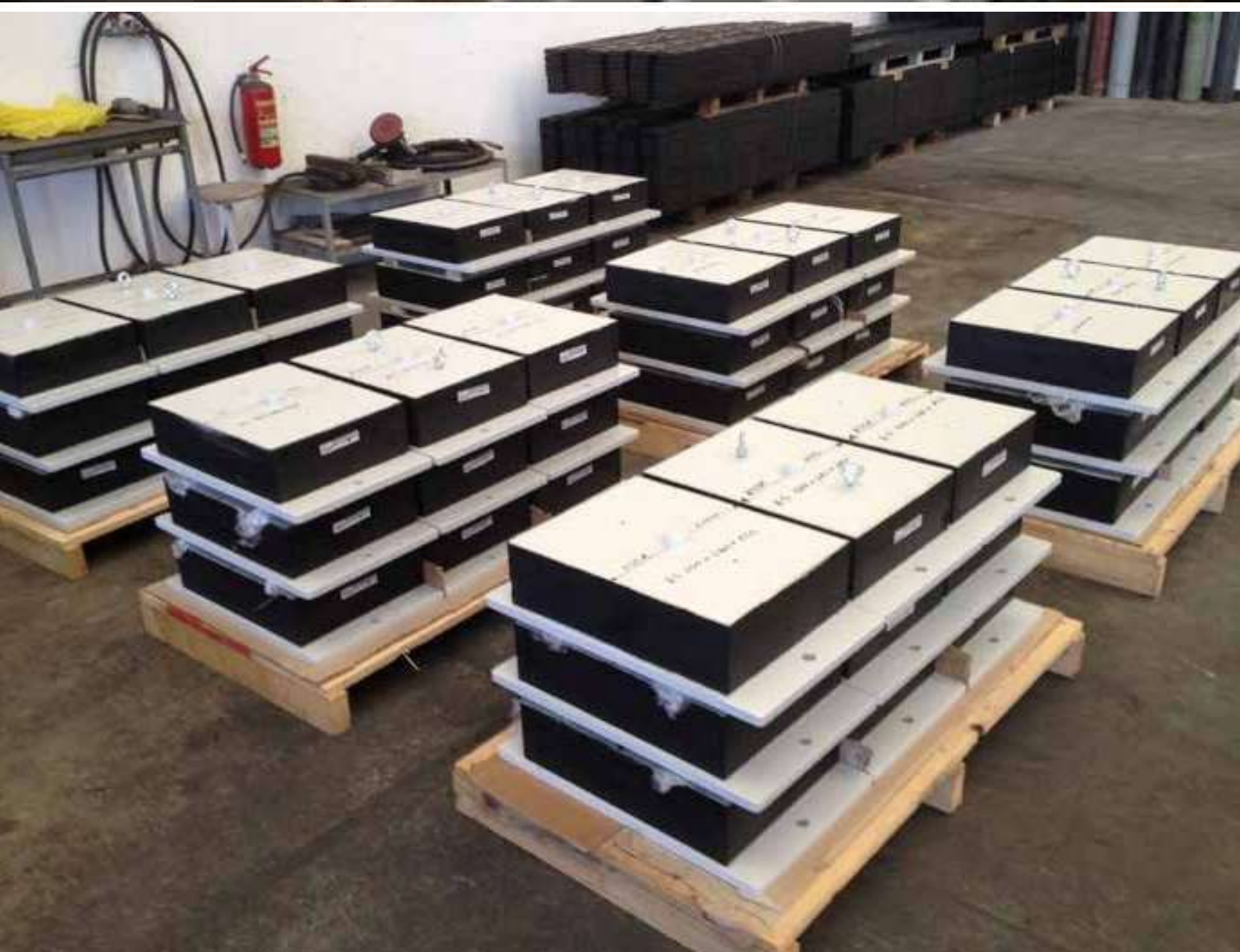
B = Dimension of the elastomer in transversal direction

H = Total height

IDENTIFICATION LABEL

 	DISPOSITIVE TYPE	YEAR	JOB	N _{ed,max} SLU (kN)	V _{x,max} SLU (kN)	Disp. X (mm)
	DISPOSITIVE CODE	ORDER	SERIAL NUMBER	RANK	V _{y,max} SLU (kN)	Disp. Y (mm)
2204-CPR-0367.1.m-2013						

PRODUCTS



CORROSION PROTECTION

The components exposed to atmospheric agents are protected with C4 H anticorrosive treatment compliant with ISO 12944-5, carried out after sandblasting with Sa 2.5 white metal, with bicomponent epoxy coating with high thickness, in RAL 7001 grey.

- External surfaces, minimum thickness of dry film: 220 µm
- Internal surfaces, minimum thickness of dry film: 60 µm
- Total thickness of the cycle ≥ 280 µm

On request, depending on the atmospheric agents to which the device is subjected, different protective treatments (C5M, C5I) can be applied.

ANCHORING SYSTEMS

Various types of systems of anchorage to the structure can be designed and provided:

Friction: through the loads transferred by contact between the supporting device and the structure.

Clamps: system used to connect the device to the structure, above and below, in the event of significant vertical and horizontal loads.

Counterplates: if necessary, **SOMMA** designs and supplies steel counterplates, which are generally supplied directly to the prefabricator (in the case of CAP beams) or to the manufacturer of the metal deck in the case of a steel bridge, so that they are either incorporated into the concrete or welded to the metal deck.

Bolts: this system is generally used in the case of metal structures to resist tensile forces and horizontal loads.

Welding: welding the bearing unit to the superstructure (when it is made of steel) or to a counterplate.

HANDLING

The packaging of the bearing devices must be such that no damage occurs during transport.

The devices must be handled with care and only by qualified staff.
The bearings must be protected against damage and contamination.

If the devices are not suitable for manual lifting, appropriate sections need to be provided so that they can be lifted mechanically.

Cranes and hoists must be used to unload the bearings from the vehicle, lifting them by means of special hooks (eyebolts).

STORAGE

If the bearings are not installed immediately after delivery, they must be suitably stored on a special support that allows ventilation from below and covered with a protective sheet.

Temporary storage must ensure that the bearings are protected from damage caused by exposure to the weather (solar radiation, rain, snow or hail) and from contamination or other negative effects due to work and traffic on the site.





INSPECTION AND MAINTENANCE

The bearing devices must be inspected at regular intervals.

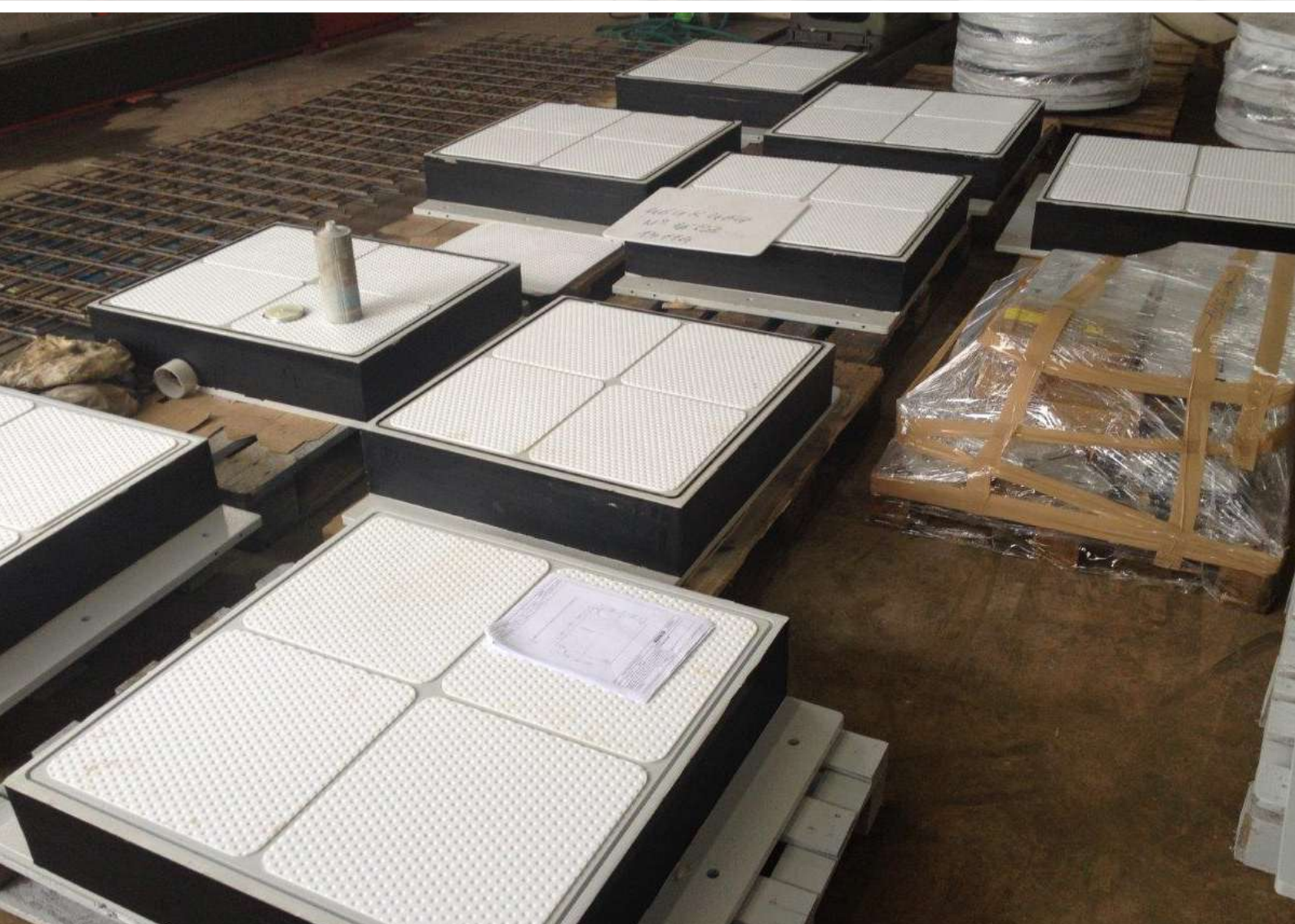
Generally, a first inspection is recommended within one year of installation. Thereafter, an inspection every five years is sufficient.

The actions to be carried out during the periodic inspection visits are:

- Check sufficient residual movement capacity with respect to the type of bearing, keeping in mind the temperature of the structure;
- Check that there are no visible defects such as cracks, incorrect positioning or unexpected movements and deformations;
- Check the condition of sealing and fastening
- Check the condition of the corrosion protection, dust cover and gaskets;
- Check the condition of the sliding and rotating surfaces;
- Check for visible defects in the adjacent structural parts.

The measurements obtained must be compared with the design values in order to be able to check the behaviour of the bearing.

Following exceptional events such as earthquakes, fires, accidents, an extraordinary inspection is recommended to verify what damage the device may have suffered as a result of the exceptional event. It is essential that, in order for the right corrective measures to be carried out, all the information gathered is passed on to the technical office.



INSTALLATION

During the installation of the bearings it is important to follow the instructions provided in the installation instructions supplied by **SOMMA**.

The actions to be carried out, regardless of the structure on which the bearing is to be installed, are to:

- check the position of the bearing and its correct orientation;
- check the Constraint Scheme;
- check on the identification plates that the design complies with the requirements for type and model, vertical and horizontal load, range of movement, permitted movements and direction (except for fixed bearing devices);
- on site check of the correctness and consistency of the support, the presence of the housings on the support and the horizontal positioning and finish of the support.

For a correct installation of the bearing device, it is of crucial importance to position the bearing device on a level surface.

The installation methods vary according to the characteristics of the superstructure.

There are different ways of anchoring to the structure when the beams are made of concrete or steel.

In addition to providing technical assistance if needed, **SOMMA** provides the necessary assembly instructions.

REPLACEMENT

A lifting operation is required to replace the bearing devices.

The type of lifting varies according to the design and characteristics of the work.

Thanks to its affiliate TLS, which has equipment and staff who are experts in the maintenance of viaducts, **SOMMA** can plan and execute lifting work on decks and the replacement of bearings.

The operations, in short and very approximately, can be summarised as:

- jack positioning;
- lifting;
- replacement of damaged bearings;
- support cleaning in order to ensure the horizontal nature of the new bearing;
- insertion of new bearing;
- lowering of deck.



QUALITY

SOMMA is CE certified according to EN1337 for the design and production of bearing devices and operates a quality system according to ISO 9001:2015.

The entire design and production process is carried out according to the requirements of EN 1337.

Independent third parties carry out regular inspections to verify compliance with the regulations.

For production according to 1337, together with the devices **SOMMA** supplies the declaration of constancy of performance in accordance with CPR 305/2011.

Outside the European Community, **SOMMA** also provides support and a declaration of compliance with the required standards.

QUALIFICATION AND PRODUCTION CONTROL TESTS

Some regulatory standards require empirical verification of the design performance of manufactured devices.

SOMMA is able to carry out static tests for medium sized bearings at its SMLAB laboratory, equipped with a press for tests on bearings and a press for load and fatigue tests for expansion joints, while for more demanding tests it relies on third party laboratories.

ELASTOMERIC BEARINGS

TYPE B

C1: Max vertical load
 Elastomer shear strain: $\gamma = 0,3$
 Rotation:
 $\alpha_{\text{long}} = 0,005 \text{ rad}$
 $\alpha_{\text{trasv}} = 0,003 \text{ rad}$

C2: Max horizontal load
 Elastomer shear strain: $\gamma = 1$
 Rotation:
 $\alpha_{\text{long}} = 0,005 \text{ rad}$
 $\alpha_{\text{trasv}} = 0,003 \text{ rad}$

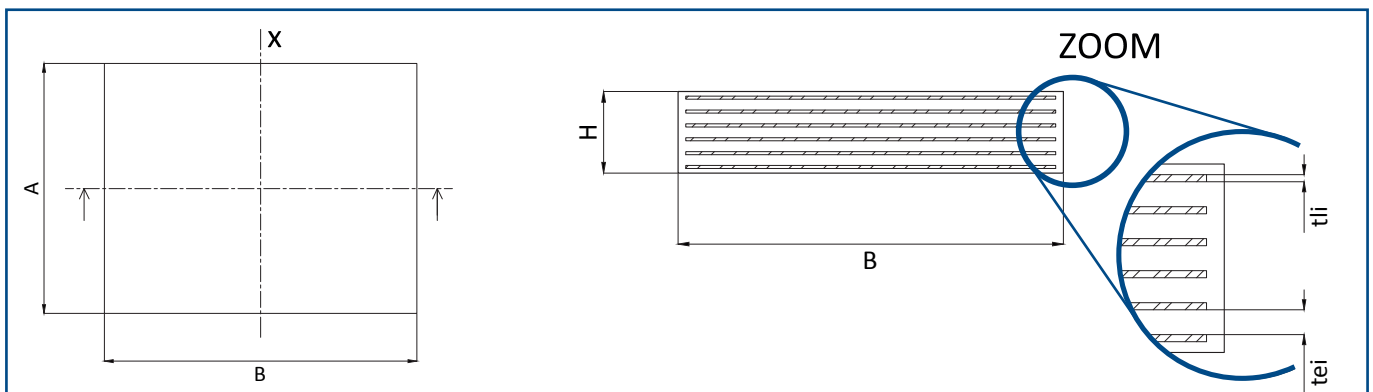
TYPE	C1: Max vertical load				C2: Max horizontal load			Stiffness		Dimensions						Weight
	F_{zd}	$F_{z,\text{min}}$	F_{xyd}	s_{eq}	F_{zd}	F_{xyd}	s_{eq}	K_H	K_V	A	B	H	n_{ei}	t_{ei}	t_{li}	W
	[kN]	[kN]	[kN]	[mm]	[kN]	[kN]	[mm]	[kN/mm]	[kN/mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[kg]
ESA B 100x150x28	236	42	4,1	4,5	190	13,5	15,0	0,90	79	100	150	28	3	5	2	1,4
ESA B 100x150x42	136	55	4,1	7,5	107	13,5	25,0	0,54	53	100	150	42	5	5	2	2,1
ESA B 100x150x56	94	70	4,1	10,5	65	13,5	35,0	0,39	40	100	150	56	7	5	2	2,8
ESA B 100x200x28	348	53	5,4	4,5	275	18,0	15,0	1,20	132	100	200	28	3	5	2	1,9
ESA B 100x200x42	206	69	5,4	7,5	162	18,0	25,0	0,72	88	100	200	42	5	5	2	2,8
ESA B 100x200x56	142	87	5,4	10,5	98	18,0	35,0	0,51	66	100	200	56	7	5	2	3,7
ESA B 150x200x31	597	77	8,1	5,4	490	27,0	18,0	1,50	213	150	200	31	3	6	2	3,1
ESA B 150x200x47	468	82	8,1	9,0	393	27,0	30,0	0,90	140	150	200	47	5	6	2	4,6
ESA B 150x200x63	325	105	8,1	12,6	250	25,7	40,0	0,64	104	150	200	63	7	6	2	6,2
ESA B 150x250x31	795	97	10,1	5,4	275	33,8	18,0	1,88	318	150	250	31	3	6	2	3,8
ESA B 150x250x47	648	100	10,1	9,0	162	33,8	30,0	1,13	209	150	250	47	5	6	2	5,8
ESA B 150x250x63	450	130	10,1	12,6	98	33,8	42,0	0,80	155	150	250	63	7	6	2	7,7
ESA B 150x300x31	960	118	12,2	5,4	780	40,5	18,0	2,25	431	150	300	31	3	6	2	4,6
ESA B 150x300x47	836	120	12,2	9,0	702	40,5	30,0	1,35	283	150	300	47	5	6	2	7,0
ESA B 150x300x63	581	150	12,2	12,6	447	40,5	42,0	0,96	211	150	300	63	7	6	2	9,3
ESA B 200x250x34	1096	135	13,5	6,3	920	45,0	21,0	2,14	401	200	250	34	3	7	2	5,5
ESA B 200x250x52	1062	130	13,5	10,5	915	45,0	35,0	1,29	260	200	250	52	5	7	2	8,3
ESA B 200x250x70	740	148	13,5	14,7	590	45,0	49,0	0,92	193	200	250	70	7	7	2	11,1
ESA B 200x300x34	1370	160	16,2	6,3	1140	54,0	21,0	2,57	556	200	300	34	3	7	2	6,6
ESA B 200x300x52	1340	160	16,2	10,5	1150	54,0	35,0	1,54	361	200	300	52	5	7	2	10,0
ESA B 200x300x70	960	175	16,2	14,7	780	54,0	49,0	1,10	268	200	300	70	7	7	2	13,4
ESA B 200x350x38	1620	190	18,9	6,3	1330	63,0	21,0	3,00	724	200	350	38	3	7	3	9,7
ESA B 200x350x58	1730	185	18,9	10,5	1390	63,0	35,0	1,80	470	200	350	58	5	7	3	14,7
ESA B 200x350x78	1205	200	18,9	14,7	970	63,0	49,0	1,29	348	200	350	78	7	7	3	19,7
ESA B 200x400x38	1820	215	21,6	6,3	1470	72,0	21,0	3,43	899	200	400	38	3	7	3	11,1
ESA B 200x400x58	2080	215	21,6	10,5	1600	72,0	35,0	2,06	584	200	400	58	5	7	3	16,9
ESA B 200x400x78	1440	230	21,6	14,7	1150	72,0	49,0	1,47	433	200	400	78	7	7	3	22,6
ESA B 250x300x41	1780	205	20,3	7,2	1475	67,5	24,0	2,81	631	250	300	41	3	8	3	10,9
ESA B 250x300x63	1920	200	20,3	12,0	1505	67,5	40,0	1,69	407	250	300	63	5	8	3	16,6
ESA B 250x300x85	1360	200	20,3	16,8	1140	63,0	56,0	1,21	300	250	300	85	7	8	3	22,3
ESA B 250x400x41	2450	275	27,0	7,2	2005	90,0	24,0	3,75	1048	250	400	41	3	8	3	14,6
ESA B 250x400x63	2650	270	27,0	12,0	2155	90,0	40,0	2,25	675	250	400	63	5	8	3	22,2
ESA B 250x400x85	2050	265	27,0	16,8	1750	90,0	56,0	1,61	498	250	400	85	7	8	3	29,8
ESA B 250x500x41	2850	345	33,8	7,2	2300	112,5	24,0	4,69	1506	250	500	41	3	8	3	18,3
ESA B 250x500x63	3335	340	33,8	12,0	2695	112,5	40,0	2,81	970	250	500	63	5	8	3	27,9
ESA B 250x500x85	2830	335	33,8	16,8	2380	112,5	56,0	2,01	716	250	500	85	7	8	3	37,4
ESA B 300x400x48	3020	335	32,4	8,1	2485	108,0	27,0	4,00	1139	300	400	48	3	9	4	21,9
ESA B 300x400x74	3200	325	32,4	13,5	2660	108,0	45,0	2,40	729	300	400	74	5	9	4	33,3
ESA B 300x400x100	2620	320	32,4	18,9	2285	108,0	63,0	1,71	536	300	400	100	7	9	4	44,7
ESA B 300x500x48	3690	420	40,5	8,1	3005	135,0	27,0	5,00	1663	300	500	48	3	9	4	27,4
ESA B 300x500x74	4000	410	40,5	13,5	3425	135,0	45,0	3,00	1064	300	500	74	5	9	4	41,8
ESA B 300x500x100	3690	400	40,5	18,9	3150	135,0	63,0	2,14	782	300	500	100	7	9	4	56,1
ESA B 300x600x48	4020	500	48,6	8,1	3190	162,0	27,0	6,00	2223	300	600	48	3	9	4	33,0
ESA B 300x600x74	4850	495	48,6	13,5	4010	162,0	45,0	3,60	1423	300	600	74	5	9	4	50,2
ESA B 300x600x100	4750	485	48,6	18,9	4100	162,0	63,0	2,57	1046	300	600	100	7	9	4	67,5

TYPE	F_{zd}	$F_{z,min}$	F_{xyd}	s_{eq}	F_{zd}	F_{xyd}	s_{eq}	K_H	K_V	A	B	H	n_{ei}	t_{ei}	t_{li}	W
	[kN]	[kN]	[kN]	[mm]	[kN]	[kN]	[mm]	[kN/mm]	[kN/mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[kg]
ESA B 350x500x51	4450	490	47,3	9,0	3650	157,5	30,0	5,25	1758	350	500	51	3	10	4	33,2
ESA B 350x500x79	4700	480	47,3	15,0	4100	157,5	50,0	3,15	1119	350	500	79	5	10	4	50,6
ESA B 350x500x107	4500	470	47,3	21,0	3850	157,5	70,0	2,25	820	350	500	107	7	10	4	68,1
ESA B 350x600x51	5120	590	56,7	9,0	4090	189,0	30,0	6,30	2377	350	600	51	3	10	4	39,9
ESA B 350x600x79	5700	580	56,7	15,0	4900	189,0	50,0	3,78	1513	350	600	79	5	10	4	60,9
ESA B 350x600x107	5500	570	56,7	21,0	4700	189,0	70,0	2,70	1109	350	600	107	7	10	4	81,9
ESA B 350x700x51	5350	690	66,2	9,0	4130	220,5	30,0	7,35	3028	350	700	51	3	10	4	46,6
ESA B 350x700x79	6700	680	66,2	15,0	5590	220,5	50,0	4,41	1927	350	700	79	5	10	4	71,1
ESA B 350x700x107	6570	670	66,2	21,0	5550	220,5	70,0	3,15	1413	350	700	107	7	10	4	95,7
ESA B 400x500x65	5530	560	54,0	12,0	4750	180,0	40,0	4,50	1780	400	500	65	4	10	4	48,0
ESA B 400x500x93	5400	550	54,0	18,0	4800	180,0	60,0	3,00	1232	400	500	93	6	10	4	68,0
ESA B 400x500x121	5350	540	54,0	24,0	4500	180,0	80,0	2,25	942	400	500	121	8	10	4	88,0
ESA B 400x600x65	6600	670	64,8	12,0	5620	216,0	40,0	5,40	2420	400	600	65	4	10	4	57,7
ESA B 400x600x93	6400	660	64,8	18,0	5800	216,0	60,0	3,60	1675	400	600	93	6	10	4	81,8
ESA B 400x600x121	6400	650	64,8	24,0	5400	216,0	80,0	2,70	1281	400	600	121	8	10	4	105,8
ESA B 400x700x65	7780	790	75,6	12,0	6050	252,0	40,0	6,30	3093	400	700	65	4	10	4	67,4
ESA B 400x700x93	7650	780	75,6	18,0	6800	252,0	60,0	4,20	2143	400	700	93	6	10	4	95,5
ESA B 400x700x121	7500	770	75,6	24,0	6300	252,0	80,0	3,15	1638	400	700	121	8	10	4	123,6
ESA B 450x600x74	7400	770	72,9	13,2	6450	243,0	44,0	5,52	2415	450	600	74	4	11	5	77,4
ESA B 450x600x106	7400	760	72,9	19,8	6500	243,0	66,0	3,68	1667	450	600	106	6	11	5	109,7
ESA B 450x600x138	7200	750	72,9	26,4	6200	243,0	88,0	2,76	1272	450	600	138	8	11	5	141,9
ESA B 450x700x74	8750	900	85,1	13,2	7250	283,5	44,0	6,44	3113	450	700	74	4	11	5	90,5
ESA B 450x700x106	8650	890	85,1	19,8	7650	283,5	66,0	4,30	2148	450	700	106	6	11	5	128,1
ESA B 450x700x138	8500	875	85,1	26,4	7250	283,5	88,0	3,22	1640	450	700	138	8	11	5	165,8
ESA B 450x800x74	9800	1050	97,2	13,2	7650	324,0	44,0	7,36	3841	450	800	74	4	11	5	103,5
ESA B 450x800x106	9800	1000	97,2	19,8	8700	324,0	66,0	4,91	2651	450	800	106	6	11	5	146,6
ESA B 450x800x138	9750	985	97,2	26,4	8200	324,0	88,0	3,68	2023	450	800	138	8	11	5	189,7
ESA B 500x600x78	8300	860	81,0	14,4	7250	270,0	48,0	5,63	2385	500	600	78	4	12	5	88,5
ESA B 500x600x112	8100	850	81,0	21,6	7300	270,0	72,0	3,75	1642	500	600	112	6	12	5	125,6
ESA B 500x600x146	8100	835	81,0	28,8	6900	270,0	96,0	2,81	1251	500	600	146	8	12	5	162,7
ESA B 500x700x78	9700	1050	94,5	14,4	8300	315,0	48,0	6,56	3098	500	700	78	4	12	5	103,5
ESA B 500x700x112	9650	990	94,5	21,6	8600	315,0	72,0	4,38	2132	500	700	112	6	12	5	146,8
ESA B 500x700x146	9500	970	94,5	28,8	8100	315,0	96,0	3,28	1625	500	700	146	8	12	5	190,1
ESA B 500x800x78	11000	1150	108,0	14,4	9050	360,0	48,0	7,50	3845	500	800	78	4	12	5	118,4
ESA B 500x800x112	11000	1120	108,0	21,6	9850	360,0	72,0	5,00	2646	500	800	112	6	12	5	168,0
ESA B 500x800x146	10800	1100	108,0	28,8	9300	360,0	96,0	3,75	2017	500	800	146	8	12	5	217,5
ESA B 600x800x105	13400	1400	129,6	21,00	12200	432,0	70,0	6,17	3065	600	800	105	5	14	5	181,8
ESA B 600x800x143	13200	1350	129,6	29,40	11600	432,0	98,0	4,41	2232	600	800	143	7	14	5	245,2
ESA B 600x800x181	12900	1320	129,6	37,80	10800	432,0	126,0	3,43	1755	600	800	181	9	14	5	308,7

KEY LABEL

F_{zd} : Maximum vertical load.
 $F_{z,min}$: Minimum vertical load.
 F_{xyd} : Horizontal load.
 s_{eq} : Equivalent displacement.
 K_H : Horizontal stiffness.
 K_Z : Vertical stiffness.
A: Dimension of the elastomer in longitudinal

direction.
B: Dimension of the elastomer in transversal direction.
H: Height of bearing.
 n_{ei} : Number of elastomeric layers.
 t_{ei} : Thickness of an elastomeric layer.
 t_{li} : Thickness of a steel plate.
W: Weight of the bearing.





Via Carlo Mirabello 12a 00195 [Rome]
Phone +390496895749

Via dei Colonizzatori snc 04011 Aprilia [Latina]
Phone +390645769160

Via Silvio Pellico 4 35036 Montegrotto Terme [Padua]
Phone +390496895749

✉ info@sommainternational.com
🌐 www.sommainternational.com
in Somma International