



**SPHERICAL BEARINGS
ERGOFLON SPHERE TYPE**

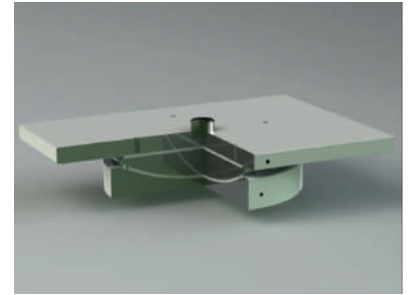
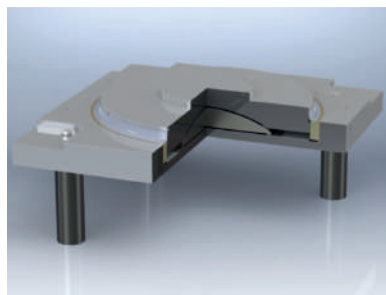
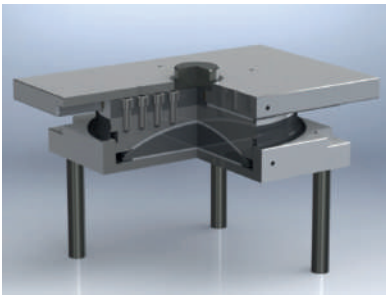


SPHERICAL BEARINGS ERGOFLOL SPHERE TYPE

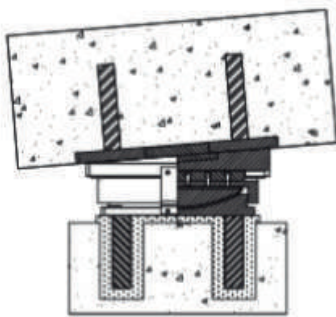
SOMMA 'ERGOFLOL SPHERE' type devices are spherical hinges that permit rotations of up to ± 0.055 rad around all horizontal axes. The bearings consist of a baseplate with convex inner surface (rotational element) and an upper plate with concave surface. A plate of PTFE and mating material is placed between them and constitutes the surface sliding curve.

Spherical bearings made of PTFE are also used in combination with flat sliding elements and guides, to create free (Multidirectional) and guided (Unidirectional) bearings. A spherical bearing int combined with a flat sliding element can be used in conjunction with a retaining ring to create a fixed bearing.

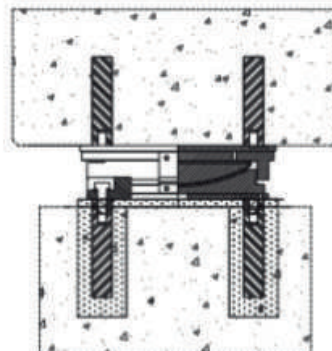
It can be anchored to the structure with dowels, bolts or pins.



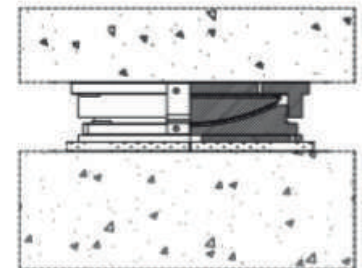
ERGOFLOL SPHERE bearings are designed according to EN 1337



Superior anchor with pin put in the counter plate and linked to the structure with anchor. It can be used also for steel structure, with counter plate settled to the beam. Inferior anchor with bolt.



Superior anchor with bolt and anchor linked to the structure. It can be used also for steel structure, with anchor linked to the beam. Inferior anchor with bolt.



Superior and inferior anchor with bonding resin. It can be used also for steel structure.

KEY TO LABEL

ESF : Bearing ERGOFLON SPHERE **Fixed**.

ESL: Bearing ERGOFLON SPHERE
Unidirectional Longitudinal.

EST: Bearing ERGOFLON SPHERE
Unidirectional Transversal.

ESM: Bearing ERGOFLON SPHERE
Multidirectional.

ESF 1000-200 : Bearing ERGOFLON SHPERE fixed with 1000 kN of vertical load - 200 kN of horizontal force.

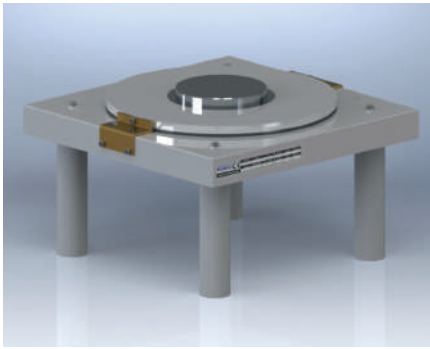
Or **ESF 1000-200-150** : Bearing ERGOFLON SHPERE fixed with 1000 kN of vertical load - 200 kN of horizontal longitudinal force – 150 kN of transversal force.

ESL 7000/300-1000: Bearing ERGOFLON SPHERE Uni-Longitudinal with 7000 kN of vertical load with longitudinal movement ± 150 mm and horizontal transversal force 1000 kN.

EST 7000-1000/80: Bearing ERGOFLON SPHERE Uni-Transversal with 7000 kN of vertical load with transversal movement ± 40 mm with horizontal longitudinal force 1000 kN.

ESM 3000/300/100: Bearing ERGOFLON SPHERE Multidirectional with 3000 kN of vertical load with longitudinal movement ± 150 mm and transversal movement ± 50 mm.



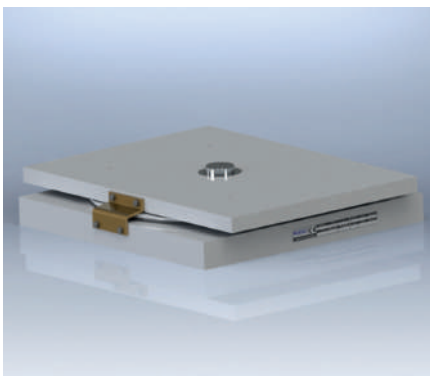
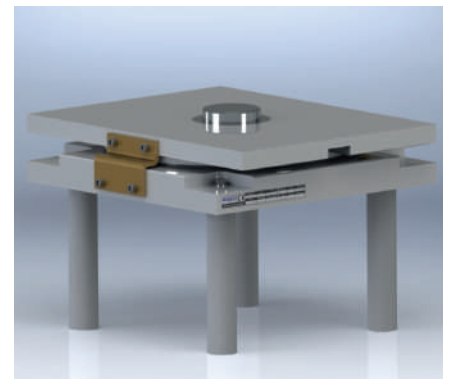


The **FIXED** type (**ESF**) **ERGOFLON SPHERE** bearing device consists of:

- Base plate mated with a retaining ring.
- Convex rotational element (spherical hinge) coupled with stainless steel and PTFE.
- Spherical concave cover with teeth on the ring to transfer the horizontal load.

The **UNIDIRECTIONAL (ESL-EST)** type **ERGOFLON SPHERE** bearing device consists of:

- Base plate mated with a retaining ring.
- Convex rotational element (spherical hinge) coupled with stainless steel and PTFE.
- Spherical concave cover with teeth on the ring to transfer the horizontal load.
- Upper selection “sliding plate” with directional guides and stainless steel plate coupled with PTFE.



The **MULTIDIRECTIONAL (ESM)** type **ERGOFLON SPHERE** bearing device consists of:

- Concave base plate.
- Convex rotational element (spherical hinge) coupled with stainless steel and PTFE.
- Upper element “sliding plate” with stainless steel sheet of coupling with PTFE.

ERGOFLON SPHERE'S CHARACTERISTIC

- Excellent quality/price ratio
 - Great durability of the device
 - Protection of structural components
 - Ease of installation
 - Ease of replacement
 - High load capacity
 - High resistance to extreme temperatures
 - High rotation
-

ELEMENTS AND MATERIALS OF THE BEARING



ELEMENT	MATERIAL	STANDARD
POT	S355J2 /S355J0W	EN 10025-2 /EN 10025-5
PISTON	S355J2 /S355J0W	EN 10025-2 /EN 10025-5
SPHERICAL STEEL HINGE	S355J2 /S355J0W	EN 10025-2 /EN 10025-5
SLIDING SURFACE	X5CRNIMO 17-12 / 304/316	EN 10088 / AISI
HORIZONTAL SLIDING SURFACE	PTFE	EN 1337 / ASTM
VERTICAL SLIDING SURFACE	CM1	EN 1337
SLIDING PLATE	S355J2 /S355J0W	EN 10025-2 /EN 10025-5
CONCAVE PLATES	S355J2 /S355J0W	EN 10025-2 /EN 10025-5
ANCHOR DOWLELS	C45 BON / 39NICRMO3	EN 10083

Spherical bearings are designed and manufactured in accordance with the European Standard EN 1337-7.

Can also be designed and manufactured according to AASHTOO or other national and international standards.



IDENTIFICATION LABEL

 	DISPOSITIVE	YEAR	JOB	Nsd, SLU	Vx, SLU	Displacement X
	TYPE	ORDER NUMNER	SERIAL NUMBER	RANK	Vy, SLU	Displacement Y
1833-DPC-95/467/EC/0096						

The external steel plates are provided of anti-corrosion treatment applied on the surface exposed to chemical attack, the standard protection system, category C4 according to ISO 12944 is realized as follows:

- White metal-blasting SA2.5 type;
- 1° coat: epoxy-ammino;
- 2° coat : polyurethane top coat.

A minimum 260 µm thickness of the cycle is resulting.

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 (when it is made of CAP).

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

When installing the bearings devices always follow the instructions provided in the installation instructions supplied by **SOMMA**.

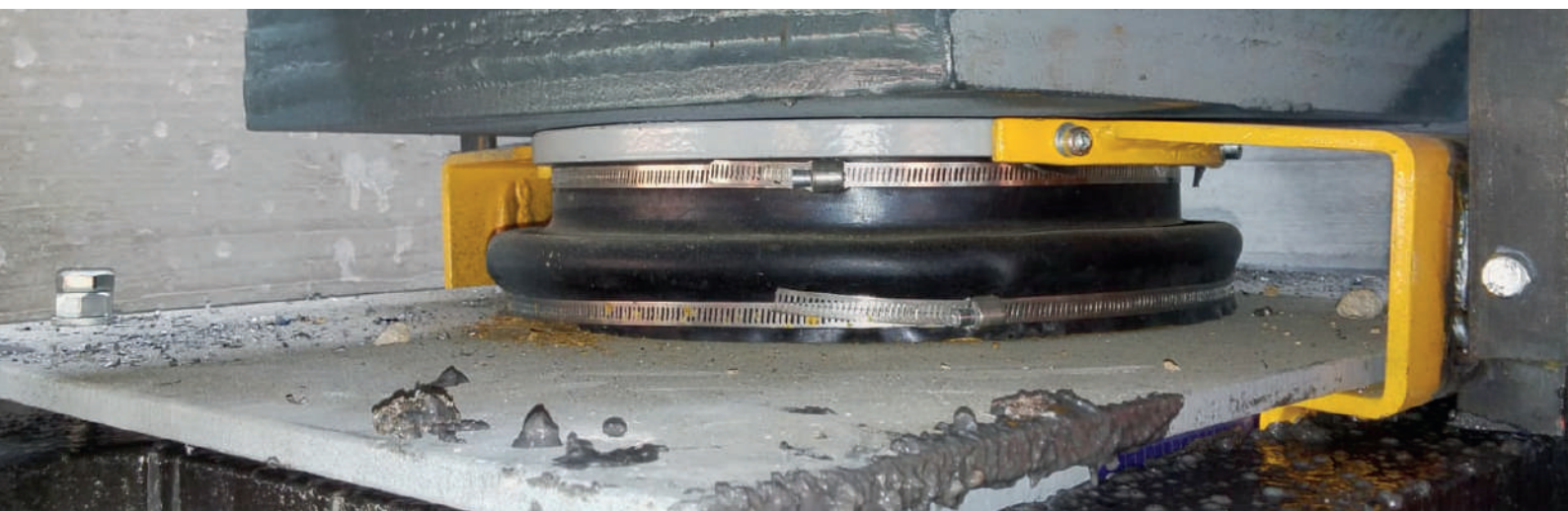
The actions to be carried out, regardless of the structure on which the bearing is to be installed, are to:

- 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.
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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.

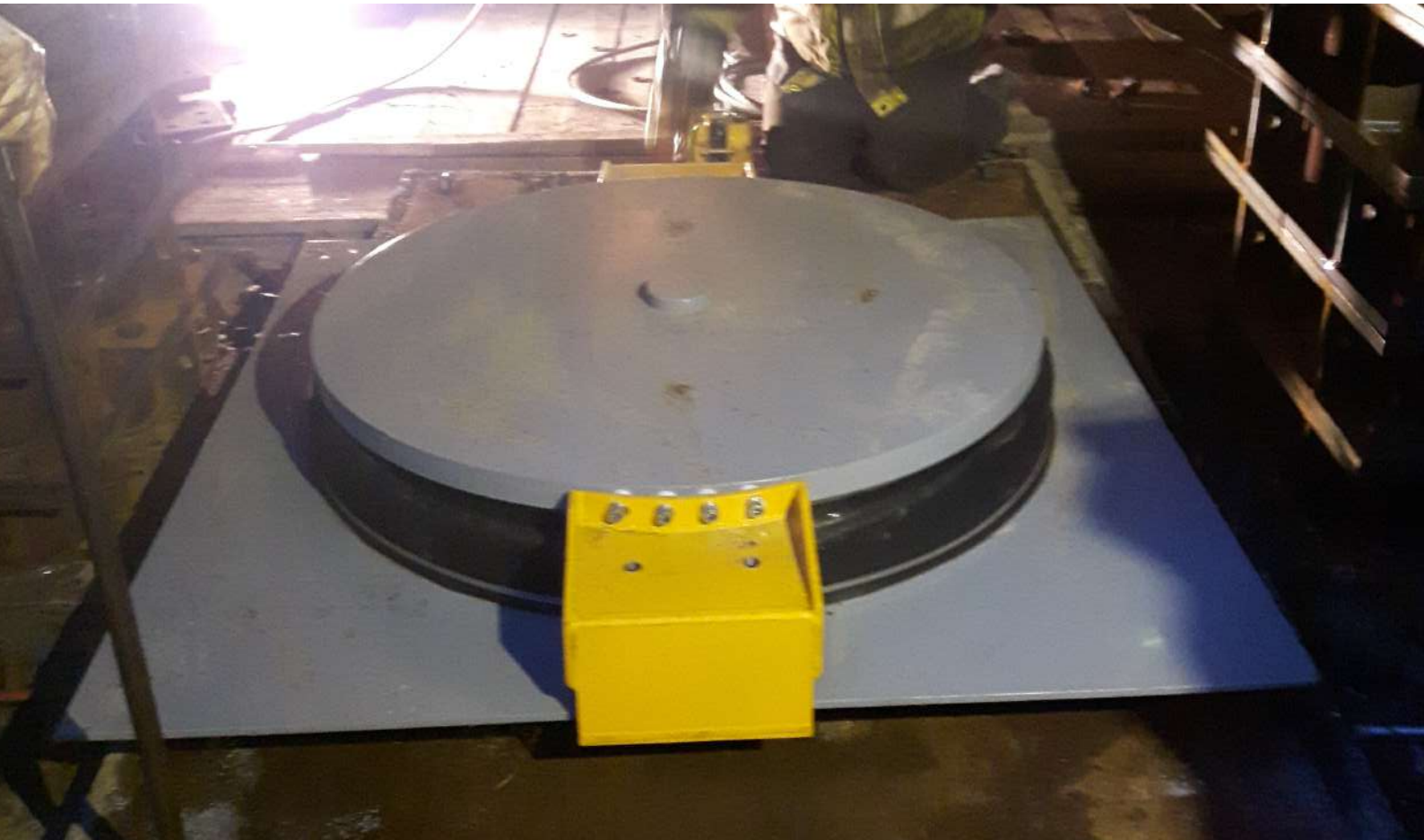
For production according to 1337, together with the devices **SOMMA** supplies the declaration of constancy of performance in accordance with CPR 305/2011.

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

STORAGE

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 SOMLB 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.





← + 23mm



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