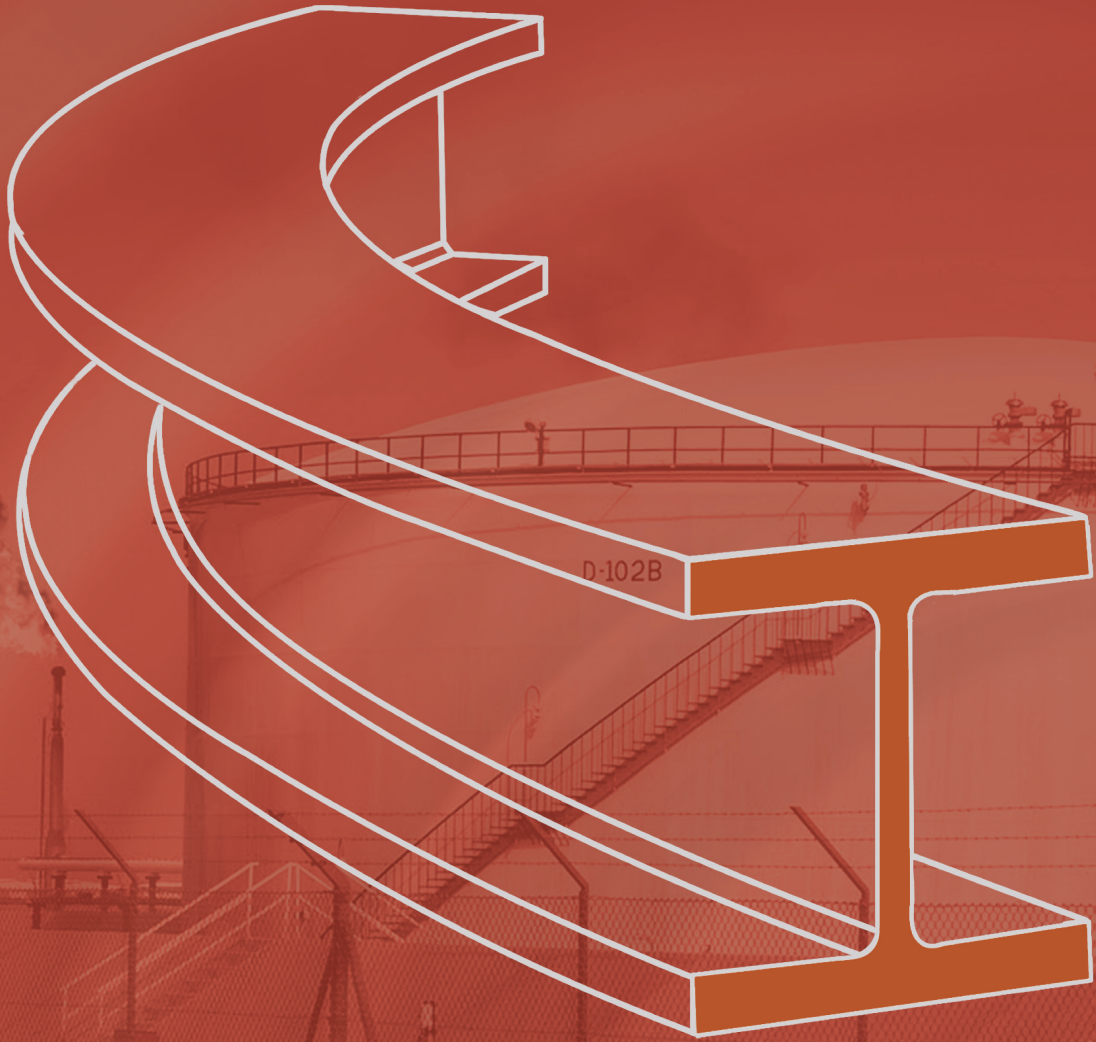


Laminated Elastomeric Bearings, SBSCO

شركة المشغولات والمباني المعدنية المحدودة
Steel Building & Structure Co. Ltd.



SBSCO Industrial Services

سبسكو للخدمات الصناعية

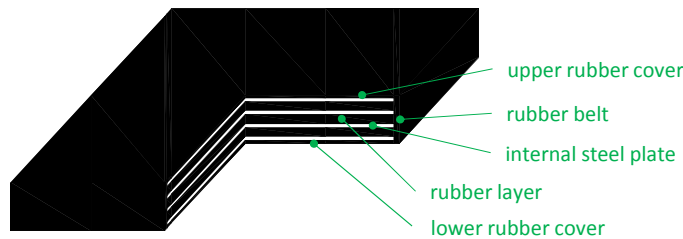


SBSCO designs and manufactures laminated elastomeric bearings, SBSCO PAD, as per following requirements:

- EN 1337
- BS 5400
- AASHTO LRDF

All bearings described in this brochure are covered by the CE marking when EN 1337 is required.

A laminated elastomeric bearing is a rubber bloc vulcanized with internal reinforcing steel plates. It looks like a stack of rubber layers and steel plates of constant thickness. To protect the steel plate, the stack is laterally covered by a rubber belt and a thin rubber sheet called cover at upper and lower faces.



For buildings, elastomeric bearings are usually manufactured without reinforcing steel plates and look like rubber strips. Such bearings are not allowed for engineering structures like bridges.

The bearing is a linking element between the structure and its support. For example, it can be found between the piers and the deck of a bridge. It allows:

- the transfert of vertical and horizontal loads,
- the rotation in many directions and
- the horizontal displacements

by rubber deformation as per following technical principles:

- initial bearing



- bearing under compression due to the vertical load



- bearing under rotation



- bearing under distortion due to horizontal loads and displacements



SBSCO proposes two types of rubber: **Natural (NR)** and **Neoprene (CR)** as per following physical characteristics:

	NR	CR
G modulus	0.9 MPa +/- 0.15 MPa à 23°C +/-2°C	0.9 MPa +/- 0.15 MPa à 23°C +/-2°C
hardness	60 +/-5 shore A à 23°C +/-2°C	60 +/-5 shore A à 23°C +/-2°C
tensile strength moulded test piece test piece from bearing	≥ 16 MPa ≥ 14 MPa	≥ 16 MPa ≥ 14 MPa
elongation at break: moulded test piece test piece from bearing	425% 375%	425% 375%
tear resistance	≥ 5 kN/m	≥ 7 kN/m
compression set at 24h ; 70°C	≤ 30%	≤ 15%
accelerated ageing: hardness tensile strength elongation at break	-5 / +10 Shore A (7 d, 70°C) +/-15% (7 d, 70°C) +/-25% (7 d, 70°C)	+/-5 Shore A (3 d, 100°C) +/-15% (3 d, 100°C) +/-25% (3 d, 100°C)
ozone resistance elongation 30% 96h 40°C +/- 2°C	no cracks at 25 pphm	no cracks at 100 pphm

Following is a table of a qualitative comparison of the both rubber types:

	NR	CR
resistance to:		
break	+++	+
tear	+++	+
abrasion	+++	+
successive flexions	++	+++
compression	+++	++
ageing:		
in the air	+	+++
under the sun	+/-	+++
at ozone exposition	--	+
durability to:		
heat	+/-	++
fire	--	++
cold	+++	+
electrical property isolating power	+++	+/-

To get the advantages of both rubber types (resistance of NR, durability and ageing of CR) ATCP can manufacture **laminated elastomeric bearings with NR inside** (internal rubber layers) **and CR outside** (rubber belt).

Internal and external steel plates are manufactured in S235 as per EN 10025 requirement.

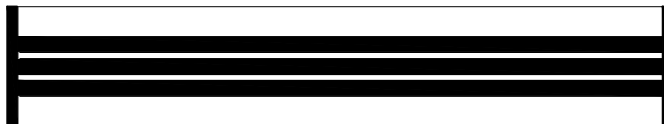
Norms describe different types of laminated elastomeric bearings. As per EN 1337-3, bearings are named as following:

- standard bearings for every kind of structure:

- type B: laminated bearing fully covered with rubber and comprising at least two reinforcing steel plates



- type C: laminated bearing with one or two outer thick steel plate. Outer plates may be checkered and allow fixings to the structure and/or to the support



- standard bearings for buildings only (not allowed for engineering structures):

- type A: laminated bearing fully covered with rubber and comprising only one reinforcing steel plate

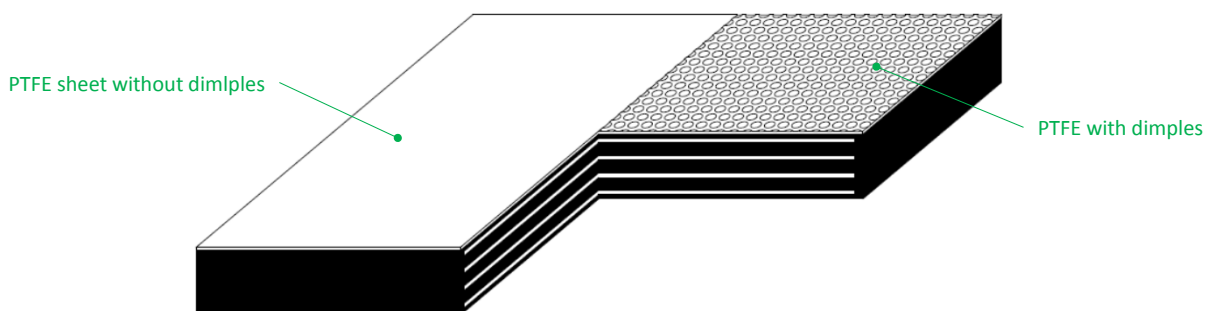


- type F: plain elastomeric bearing which may be manufactured in strip shape

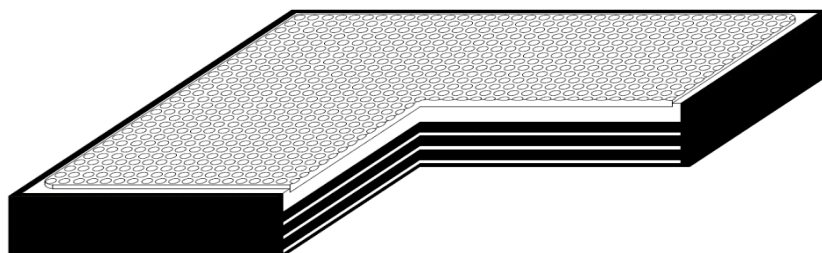


- sliding bearings for every kind of structure:

- type D: type B bearing with a PTFE sheet, with or without dimples, bonded to the rubber during the vulcanization. In case of PTFE damage, the entire bearing shall be replaced

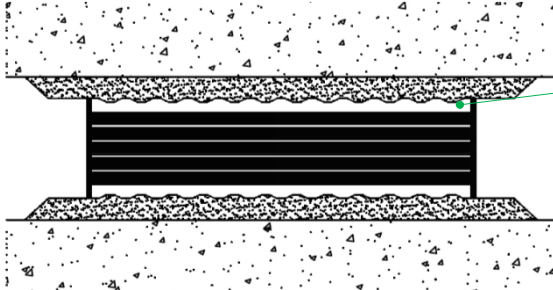


- type E: type C bearing with a dimpled PTFE sheet recessed in outer steel plate. In case of PTFE damage, the PTFE sheet may be replaced alone



SBSCO design and provide accessories like anchor systems of type C bearings. SBSCO proposes 4 types of fixings. If required, the client can ask for a mixed fixing solution.

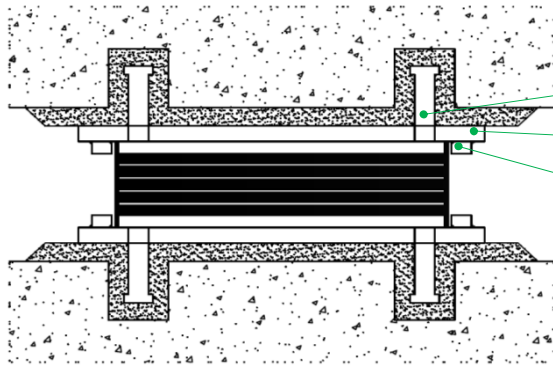
- **Type C1** : the bearing is manufactured with checkered external steel plates. These plates are directly in contact with the grout to increase the slipping resistance which is bigger than the one obtained by friction only. This technology is very cheap and let take low horizontal loads.



checkered steel plate



- **Type C2** : the bearing is installed on anchor plates. Lateral stoppers are screwed or welded on the anchor plates all around the bearing to avoid its slipping. This technology let take high horizontal loads. To remove more easily the bearing, we advise to screw at least one stopper in order to limit the jacking height.

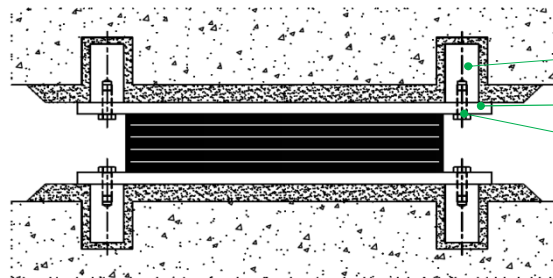


stud welded to the anchor plate

anchor plate

welded or screwed stopper

- **Type C3** : the bearing is manufactured with boundless external steel plates. These ones are screwed to embedded anchor dowels for a concrete structure or directly to the steel structure or to embedded anchor plates. This technology is cheap and let take high horizontal loads. The bearing can be easily removed because the jacking height is low.

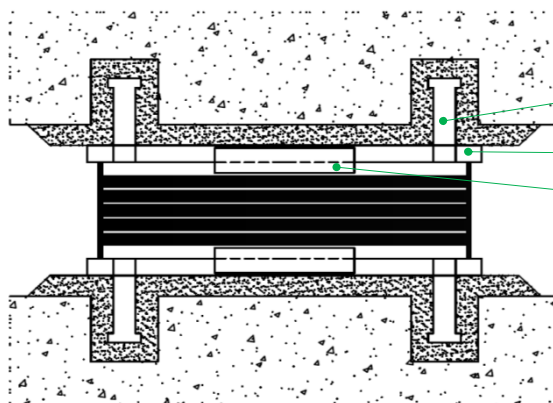


dowel

boundless external steel plate

screw

- **Type C4** : the bearing and its anchor plates are linked with shear discs which is recessed in the anchor plates and the bearing external plates. This technology lets take very high horizontal loads for a limited space. To remove the bearing the jacking height may be high.



stud welded to the anchor plate

anchor plate

shear disc

ALABUO GROUP



أكافي الصناعي
akafi.net



شركة المشغولات والمباني المعدنية المحدودة
Steel Building & Structure Co. Ltd.



شركة الخيام والمظلات المحدودة
TENTS & AWNING CO. LTD.



شركة الشهباء للإنشاءات المحدودة
AlShahba For Construction Co.Ltd.

www.alabuo.com



شركة المشغولات والمباني المعدنية المحدودة
Steel Building & Structure Co. Ltd.



CERT
0400257
Cert. No. 3109092031

kingdom Of Saudi Arabia Dammam City

**Second Industrial Area - Street 85 - Building No. 7083
Zip Code 34331-4199**

www.alabuo.co

Tel : +966 13 838 3311

fax : +966 13 838 3322

alabuo@alabuo.co