Elastomeric Bearings & Industrial Products

EA Bearings

EA Series Standard Bearings

These bearings are designed to support a vertical load up to 2000kN with the constant bearing temperature not exceeding 150°C. For bearing applications in excess of this temperature please contact our technicians for further assistance.

Translation in the plane of movement is maintained at a low frictional resistance by the use of the mating surfaces, polished stainless steel and low friction PTFE. Bearings incorporating Du(B) can be supplied for applications up to 280°C.

Support and Installation

The bearing support members must provide uniform support. The compressive bearing stress on the supports varies through the range between 6.4N/mm² and 11.3N/mm². Upon installation, the bearing surfaces must remain parallel to ensure correct bearing functionality. Once the bearing is installed the transportation fixings should be removed. Please note that bearings should not be split by anyone other than an Ekspan Ltd operative to maintain warranties.

The EA range of bearings are intended for industrial applications and are not BS5400/EN1337 compliant.

Attachment and Movement

The bearings are available as standards with four methods of attachment. For EAG types customers must ensure that they provide shear connection adequate to react to the applied loads, but excessive welding must be avoided.

Studs on EAU & EAK types are threaded studs. Seven movement combinations are available including constraint in one axis and to give further flexibility two shapes are available for each load capacity.

Bearing Types

<table>
<thead>
<tr>
<th>Bearing Connection</th>
<th>Free</th>
<th>Constrained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonding or welding</td>
<td>EAG</td>
<td>EAG.../C</td>
</tr>
<tr>
<td>Top and base plates with threaded holes.</td>
<td>EAH</td>
<td>EAH.../C</td>
</tr>
<tr>
<td>Threaded studs in top and base plates.</td>
<td>EAJ</td>
<td>EAJ.../C</td>
</tr>
<tr>
<td>Threaded studs in base plate, threaded holes in top plate.</td>
<td>EAK</td>
<td>EAK.../C</td>
</tr>
</tbody>
</table>

Elastomeric Bearings & Industrial Products

EA Bearings

Part Number

E A x xxx / xxx / xx / xx

EA Series Bearings

Fixing Type: G, H, J, or K

Load in tonnes

Dimensions in mm

Transverse movement +/- Y or /C (constrained)

Longitudinal movement +/- X

Base plate dimension A

Free Version

Longitudinal Movement

For bearings supplied with studs the holes should be chamfered 2mm at 45° on the side adjacent to the bearing.

Holes in the structure to suit the bearings should be drilled 22mm diameter on centres G & F within ±1mm.

M20 x 2.5 tapped holes or studs as specified if applicable.

Attachment and Movement

The bearings are available as standards with four methods of attachment. For EAG types customers must ensure that they provide shear connection adequate to react to the applied loads, but excessive welding must be avoided.

Studs on EAU & EAK types are threaded studs. Seven movement combinations are available including constraint in one axis and to give further flexibility two shapes are available for each load capacity.
Modular sliding bearings are used to permit structural movement to take place with the minimum coefficient of friction. Often the excellent properties of PTFE fail to be realised because of the use of inadequate mating surfaces or poor installation.

Ekspan EQF uses PTFE and stainless steel to offer a simple and economical sliding support.

- Virgin plain PTFE is recessed into a steel base plate
- Under design load the PTFE will not cold flow
- The EQF strip is designed for easy installation.

The base plate can be tack welded or screwed into place. Bonding with a suitable adhesive is also possible providing the working conditions permit.

Ekspan EQF is ideal for use in numerous industrial applications where structures are required to move under load. Examples of such applications are as follows:

- Pipes and ducts
- Ovens
- Floors and roofs
- Heavy fabrications during construction
- Slipper pads for moving heavy machinery

Friction

When in operation the Ekspan EQF used in conjunction with a stainless steel sliding plate can give a coefficient of friction of approximately 0.05.

High Temperatures

At sustained temperatures above 100°C we recommend the use of an alternative DU bearing material. Please specify temperature range at enquiry stage so that the appropriate materials can be offered.

Load capabilities are for temperatures ranging -35°C to 50°C. For temperatures more than 50°C please see Fig.2 for advice on reduced load capacities.

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- Pipes and ducts
- Ovens
- Floors and roofs
- Heavy fabrications during construction
- Slipper pads for moving heavy machinery

Load Capacity

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Width mm</th>
<th>Load Capacity</th>
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</thead>
<tbody>
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<td>EQF 25</td>
<td>25</td>
<td>215</td>
</tr>
<tr>
<td>EQF 50</td>
<td>50</td>
<td>700</td>
</tr>
<tr>
<td>EQF 100</td>
<td>100</td>
<td>1500</td>
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</table>

The EQF is intended for industrial applications and is not EN1337 or Bs5400 compliant.
Elastomeric Bearings & Industrial Products

Elastomeric Bearings & Industrial Products

Elastomeric Bearings

Elastomeric Bearings and Strip

Laminated elastomeric bearings consist of natural rubber layers separated by steel plates. Around this makeup a rubber cover encapsulates the bearing (Fig. 1). These items are then vulcanised to create a compact maintenance free bearing.

Natural rubber is not too sensitive to changes in temperature and shows only slight growth in deformation, over the period of deformation at a constant load (low creep).

Natural rubber is highly resistant against ozone, ageing, UV and chemical effects. The vulcanized steel reinforcement plates meet the requirements of BS1449.

Natural Rubber strip (Fig. 2) can be utilised to support a concrete diaphragm and natural rubber pads (Fig. 3) are used to support individual beams.

These products are commonly used where the vertical loads/translations are relatively low.

Where increased vertical load capacity/translations and rotations are required then the preferred option would be to utilise a laminated elastomeric bearing.

Sliding Top Plate

For optimum performance we recommend that the EQF strip slides against a stainless steel top plate. We utilise dissimilar welding rods to weld a 3mm stainless steel sheet to a mild steel backing plate that can then be fixed within your structure.

Sliding Top Plate Size

The top plate size should be selected so that the EQF strip is covered at all times during translation. Once total required movements are known, transversely and longitudinally the following diagram - Fig. 4 can be used to work out the required top plate size.

Standard Sizes

Ekspan EQF is available in 1 metre lengths. Shorter lengths are available, however the load capability per metre will be reduced accordingly.

Installation

Welding - Ekspan EQF is supplied in a weld prepared coating. A tack weld to a steel sub base is sufficient. When welding make sure that PTFE is protected from welding spatter. Any spatter must be removed before pairing with the stainless steel top plate.

Screws and Rivets – Ekspan EQF can be supplied with drilled holes, countersunk if required to enable the strip to be fixed to a backing plate or concrete plinth.

Bonding – Ensure that the bonding agent is suitable for use with mild steel and the mating surface that you intend to adhere the EQF to. We recommend ensuring that the mating surface is as clean as possible to ensure good adhesion.

Painting – The EQF can be finish painted during installation if required. The PTFE discs should never be painted. If the PTFE does come into contact with the paint it can be wiped clean.

Mating Surfaces

The EQF mating surface should be smooth, flat and capable of providing uniform support.

Failure to install correctly may cause uneven loading of the PTFE resulting in poor performance and possible damage.

Care should be taken to seal the edges around the EQF strip to prevent ingress of moisture that could lead to corrosion.

Special Fabrications

Should you have a bespoke application that you feel the Ekspan EQF strip could be utilised for please do not hesitate to contact us.

Elastomeric Bearings

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Fig. 1

Fig. 2

Fig. 3

Elastomeric Bearings & Industrial Products

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### Elastomeric Bearings & Industrial Products

#### EKR Series Elastomeric Strip Bearings - 60 IRHD

<table>
<thead>
<tr>
<th>Code</th>
<th>Width</th>
<th>Thickness</th>
<th>Maximum Load</th>
<th>Shear Deflection</th>
<th>Shear Stiffness</th>
<th>Rotation Rads / 100kN</th>
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<tr>
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</table>

#### EKR Series Elastomeric Plain Pad Bearings - 60 IRHD

<table>
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<tr>
<th>Code</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
<th>Maximum Load</th>
<th>Shear Deflection</th>
<th>Shear Stiffness</th>
<th>Rotation Rads / 100kN</th>
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<td>1.88272</td>
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</table>

The above dimensions and loadings are for BS5400 compliant bearings.

Ekspan also offers a range of EN1337-3 laminated elastomeric bearings. If you have a requirement for these then please do not hesitate to contact one of our sales representatives who will be able to assist further.
Elastomeric Bearings & Industrial Products

The Shape of the Bearings

If the rotation capacity of the laminated elastomeric bearing is such that the requirement is similar in all directions (transversely and longitudinally) then cylindrical bearings can be utilised. Most commonly rectangular bearings are utilised as in most cases the longitudinal rotation exceeds the transverse figure.

If cylindrical bearings are required then please contact one of our sales representatives who will be able to assist further.

Sliding Bearings

Plain pad, strip and laminated elastomeric bearings all allow a certain amount of shear. In elastomeric bearings this is determined by the internal rubber layers. For larger translations, these products can be modified to incorporate a Polytetrafluoroethylene (PTFE) layer which is either vulcanised to the bearing itself or affixed to a steel plate which has been vulcanised to the bearing. If you have a requirement for this type of product please contact one of our sales representatives who will be able to assist further.

PTFE topped bearings can only be supplied in accordance with BS5400.

Recommended Installation

In all cases, Ekspan Elastomeric Bearings should be bedded on cementitious or epoxy mortar sufficiently thick (5mm to 20mm) to remove surface irregularities of the structural concrete or steelwork in contact with the bearing. The bedding operation should be carried out while the mortar is plastic.

Concrete Structure

It is possible during construction and under certain temporary loading conditions for a bearing to be subjected to a combination of high shear load coupled with a low vertical load which may give rise to slippage.

In such cases, the bearing will need to be positively located to both the substructure and superstructure.

This may be achieved by locating the bearing within 6mm recesses. It should be noted that the depth of recesses reduces the effective height of the bearing and its associated shear movement capacity.

This method of location is preferable to the use of stub dowels which must be accurately positioned.

Steel Structure

Cast-in-situ Superstructure

It is possible to incorporate the laminated elastomeric bearings into the temporary formwork and cast directly into the concrete. If this method is utilised, then it is important to consider future removability of the bearings. It is preferable, if possible, to post install the elastomeric bearings as this method makes future replaceability much simpler without the need for breaking out of the existing concrete diaphragm / beam.

Once the bearings have been installed it is advisable to wipe off any excess grout materials as this may restrict translations and rotations. We do not recommend using solvents to clean off the materials as these may have an adverse effect on the elastomer.

Temporary Support of Beams

It is standard practise to design bearings with all loads being transmitted vertically through the bearing which is seated horizontally on the bearing shelf. If the bearing is not seated horizontally then any eccentric loading applied through the bearing must be considered. If this is the case then please contact one of our sales representatives who will be able to assist further.

Dowels and Dowel Caps

Fixity may be provided by dowels passing from the sub-structure to the super-structure. One end of each dowel should be fitted with a rubber dowel cap to permit vertical translation and rotation.

Dowel bars should be located outside the bearing area thus facilitating easy bearing removal during routine bridge maintenance procedures.

The use of Ekspan mechanical pin and guide bearings (Fig. 1) should be considered in conjunction with elastomeric bearings to resist horizontal forces. The resulting combination of mechanical and elastomeric bearings provides a practical solution.

FIXED PIN AND GUIDE BEARINGS (F TYPE)

Ekspan Ltd holds the relevant accreditation in accordance with BS5400 and EN1337-8 should these bearing types be required. If you require additional information in relation to these types of bearings please refer to the Ekspan Ltd product literature titled F type bearings.

Alternatively please contact one of our sales representatives who will be able to assist further.

Please see Fig. 1 below for the standard F type range.

Dimensions - Dowel Pin Dowel Cap

<table>
<thead>
<tr>
<th>Part Number</th>
<th>A Diameter (mm)</th>
<th>B Length (mm)</th>
<th>C Diameter (mm)</th>
<th>E Length Diameter (mm)</th>
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BRIDGE & INDUSTRIAL BEARINGS

B Series  Sliding Bearings with elastomer base
E Series  Anticlastic Bearings
G & GE Series  Spherical Bearings

D Series  Line Rocker Bearings
Elastomeric Bearings
K & KE Series  Pot Bearings

EA Series  Sliding Bearings
F & FE Series  Pin and Guide Bearings
J Series  Roller Bearings

Link Bearings

EXPANSION & SEAL TYPE JOINTS

Multi Element Expansion Joints
TF Expansion Joints
Single Element Expansion Joints

Roller Shutter Expansion Joints
T-Mat Expansion Joints
EC Seal Expansion Joints

Finger Type Expansion Joints
TF B-75 and TF B-7 Expansion Joints
ES Seal Expansion Joints

A world wide service offering effective solutions in:-
Inspection • Design • Manufacture • Supply
Installation • Commissioning • Planned Maintenance

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