

MECHANICAL / STRUCTURAL BEARINGS

GRANOR® Structural Bearings – “Series B”

Introduction

GRANOR® Series “B” Structural Bearings utilise GRAFAB® being a Fabric Reinforced Elastomeric Pad as the basis of the design. By the addition of a GRAFLON® PTFE facing to the GRAFAB®, a sliding bearing can be produced. Unlike a normal Elastomeric Bearing Pad, the GRAFAB® pad is capable of a much higher stress, without exhibiting the ‘squashing’ effect typical under high stress applied to a plain bearing pad. The use of GRAFAB® permits a robust, resilient pad ideal for simple structural bearings with typical applications in mining, conveyor belt systems, pedestrian overpasses and similar lightly loaded structures, Available in three configurations –

- * BFX - Fixed Type
- * BFP – Free Float Type
- * BGS – Guide / Slide Type

Specification

Series “B(20)” Structural Slide Bearings –

GRANOR® / GRAFLON® / PTFE Structural Slide Bearings combine the advantages of GRAFLON® PTFE material with those of GRAFAB® Fabric Reinforced elastomeric bearing pads thus providing the design engineer with a simple, low cost, functional structural bearing suitable for use in a number of applications including point loads on a corbel where use of Slipjoint may not be appropriate.

Bearing Identification

The three prefixes of the basic types, BFX, BFP, BGS, is followed by the rated working load capacity in kN.

Thereafter, movement either lateral or longitudinal is shown eg. BGS(20)-100-0/40,

BGS(20) = Series / Style / Construction

-100 = Rated working load – kN

-0/ = Movement – lateral - +/- in mm’s – from neutral. (Typically “+/-2mm” for a guided bearing.)

-/40 = Movement – longitudinal - +/- 40 mm from neutral position.

Required, above part number becomes BGS(20)-100-0/40. Where non-standard movement capacity is required, it can be described by modification to the standard part number eg; If longitudinal sliding movement of +/-50mm is required, then P/No. becomes BGS(20)-100-0/50

Materials used

Fixings - Grade 8.8 Galvanised Threaded Rod, C/W lock nuts, or bolts.

Body – Gr. 250 M.S. Galvanised (Or stainless steel can be substituted).

Elastomeric Pad – GRAFAB® PTFE – GRAFLON® Grade 1 PTFE.

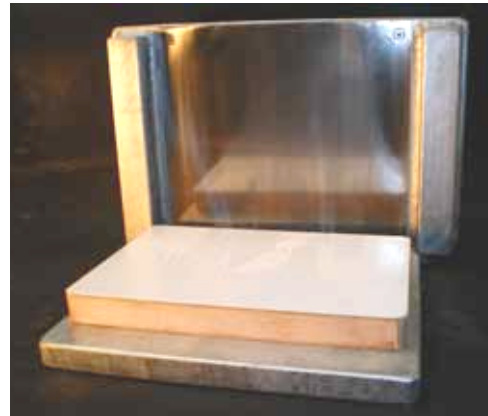
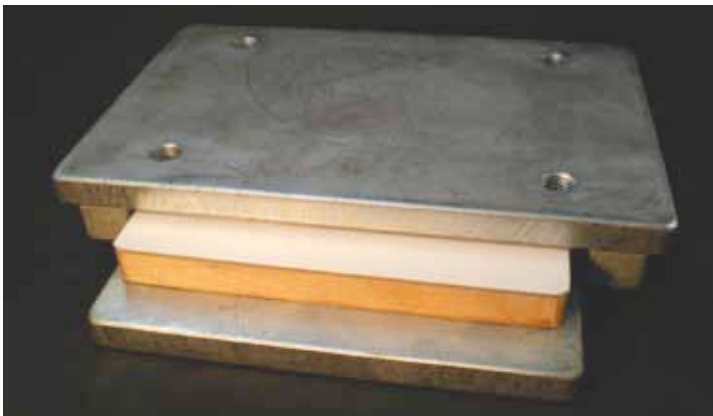
Stainless Steel Interface – Gr. 316 polished.

Removable Bearings

Where a removable bearing is required, if upper & lower structural members are steel, then bolting is suggested. If a concrete structure, then an additional Upper & Lower steel attachment plate is necessary. The bearing bolts to these additional members which in turn are cast into the structure.

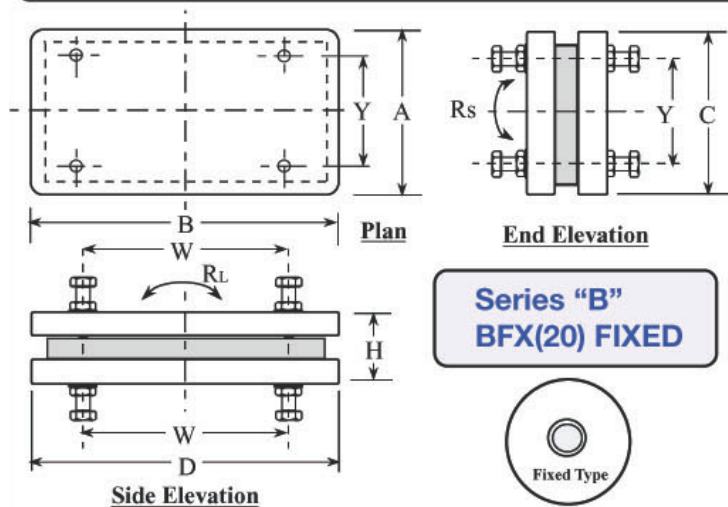
Installation

There is no one recommendable / preferable technique of installation. If a steel structure then tack welding (or welding) is feasible, but bearing becomes difficult to remove. If concrete then either cast in grout bolts or additional top and / or bottom attachment plates could be used.



Photos of Structural Bearing Series BGS – Guide / Slide Type.

Granor® Graflon® Structural Bearings Series "B"



GRAFLON STRUCTURAL BEARINGS – Series "B" Fixed – Structural Type BFX(20)

The Graflon Type BFX(20) Fixed structural bearings are fully restrained in both directions. The BFX(20) bearing is used to 'fix' the structure and yet provide rotational capacity equal to the rotational characteristics to the Type BFP(20) and BGS(20) slide bearings.

Alternative rotational capacities are readily available. Insulated bearings for 'hot' applications are available.

Bearings are suitable for grouted, bolt/stud or welded connections. Where a connection to a steel member is required, designer should nominate stud size, grade and length. Two nuts and flat washer supplied as standard.

Removable designs – Modifications to the standard range can provide a bearing which is 'removable.'

| PART NO. BFX SERIES 20 FIXED TYPE | RATED VERT. LOAD (kN) | RATED HORIZ. LOAD (kN) | BEARING DIMENSIONS | | | ROTATION CAPACITY | | GROUT BOLT DETAIL | |
|--------------------------------------------|-----------------------------|------------------------------|------------------------------------------|-------------------------------------------|----------------------------|-----------------------------------------------|----------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|
| | | | TOP PLATE DIMENSIONS A x B (mm) | BASE PLATE DIMENSIONS C x D (mm) | BRG HEIGHT H (mm) | ROTATION SHORT R _s (rad.) | ROTATION LONG R _L (rad.) | GROUT BOLT CENTRES TOP & BOTTOM Y x W (mm) | GROUT BOLT DETAILS (C / W NUT) (GRADE 8.8) |
| BFX(20)-100-0/0 | 100 | 20 | 100 x 170 | 100 x 170 | 53 | 0.028 | 0.015 | 70 x 115 | 8 x M16 x 100 |
| BFX(20)-200-0/0 | 200 | 40 | 140 x 210 | 140 x 210 | 53 | 0.019 | 0.012 | 95 x 140 | 8 x M16 x 100 |
| BFX(20)-300-0/0 | 300 | 60 | 165 x 245 | 165 x 245 | 69 | 0.022 | 0.014 | 110 x 165 | 8 x M20 x 100 |
| BFX(20)-400-0/0 | 400 | 80 | 180 x 280 | 180 x 280 | 69 | 0.020 | 0.012 | 120 x 190 | 8 x M20 x 100 |

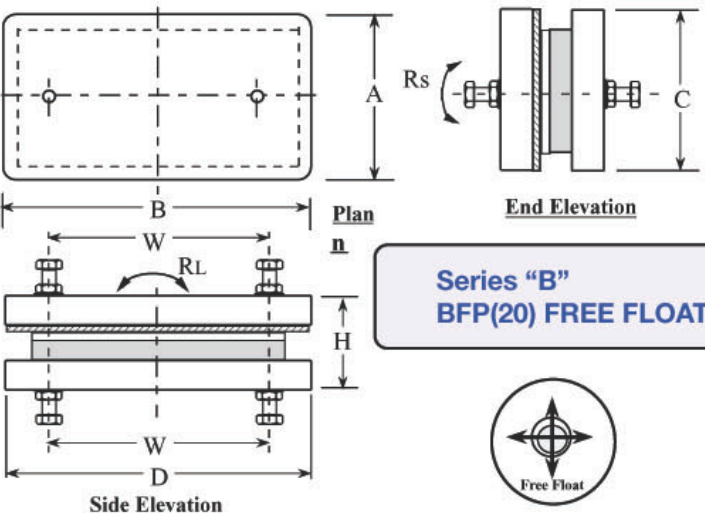
GRAFLON STRUCTURAL BEARINGS – Series "B" Free Float – Structural Type BFP(20)

The Graflon type BFP(20) Free Float Slide Bearings provide a high point load capacity bearing suitable for columns or corbels, and yet provide a low friction sliding bearing with rotational capacity, for structural applications where the GRANOR Slipjoint Type "SJJ" may not be suitable.

Standard free float bearing movement capacity is +/- 25mm in all directions. Alternative movement capacities, and/or rotational capacities are readily available.

Bearings are suitable for grouted, bolted/stud, or welded connections. Where connection to a steel member is required, designer should nominate stud size, grade and length. Two nuts and flat washer supplied as standard.

Removable designs – Modification to the standard range can provide a bearing which is 'removable.'



| PART NO. BFP SERIES 20 FREE FLOAT | RATED VERT. LOAD (kN) | BEARING DIMENSIONS | | | ROTATION CAPACITY | | GROUT BOLT DETAIL | |
|--------------------------------------------|-----------------------------|------------------------------------------|-------------------------------------------|----------------------------|-----------------------------------------------|----------------------------------------------|---------------------------------|-----------------------------------------------------|
| | | TOP PLATE DIMENSIONS A x B (mm) | BASE PLATE DIMENSIONS C x D (mm) | BRG HEIGHT H (mm) | ROTATION SHORT R _s (rad.) | ROTATION LONG R _L (rad.) | GROUT BOLT CENTRES W (mm) | GROUT BOLT DETAILS (GRADE 8.8) (C / W NUT) |
| BFP(20)-100-25/40 | 100 | 165 x 180 | 165 x 180 | 50 | 0.028 | 0.018 | 100 | 4 x M16 x 75 |
| BFP(20)-200-25/40 | 200 | 205 x 220 | 205 x 220 | 50 | 0.019 | 0.014 | 140 | 4 x M16 x 75 |
| BFP(20)-300-25/40 | 300 | 230 x 255 | 230 x 255 | 65 | 0.022 | 0.016 | 170 | 4 x M16 x 75 |
| BFP(20)-400-25/40 | 400 | 245 x 295 | 245 x 295 | 65 | 0.020 | 0.013 | 210 | 4 x M16 x 75 |
| BFP(20)-500-25/40 | 500 | 255 x 335 | 255 x 335 | 70 | 0.025 | 0.015 | 250 | 4 x M16 x 75 |
| BFP(20)-600-25/40 | 600 | 285 x 355 | 285 x 355 | 70 | 0.021 | 0.014 | 270 | 4 x M16 x 75 |

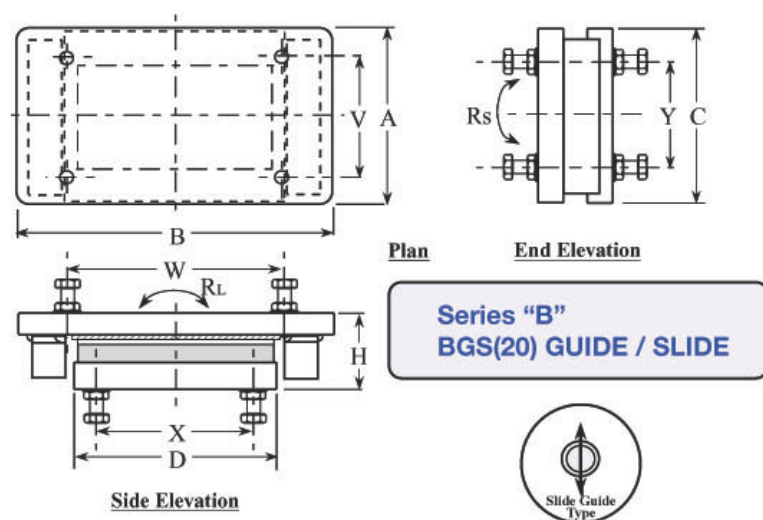
Granor® Graflon® Structural Bearings Series "B"

GRAFLON STRUCTURAL BEARINGS – Series B – Guide/Slide – Structural Type BGS(20)

The Graflon Type BGS(20) Structural Bearings provide as standard, ± 40 mm of longitudinal slide movement whilst being restrained laterally. The BGS type are frequently used in combination with the Series "B" Free Float or Series "B" Fixed bearings where lateral forces from wind etc. must be taken out, and yet still provide a low friction sliding bearing in the longitudinal direction. The designer must exercise care if more than two 'restrained' bearings are to be used in the one line of bearings. It is more common to combine one guide/slide bearing with a number of Free Float bearings.

Alternative movement capacities, and/or rotational capacities for each of the bearings listed above, are readily available.

Bearings are suitable for grouted, bolt/stud or welded connections. Where a steel connection is required, designer should nominate stud size, grade and length. Two nuts and flat washer supplied as standard.



| PART NO. BGS SERIES 20 GUIDE / SLIDE | RATED VERT. LOAD (kN) | RATED HORIZ. LOAD (kN) | BEARING DIMENSIONS | | | ROTATION CAPACITY | | GROUT BOLT DETAIL | | |
|-----------------------------------------------|--------------------------------|---------------------------------|------------------------------------------|-------------------------------------------|----------------------------|-----------------------------------------------|----------------------------------------------|------------------------------|---------------------------------|-----------------------------------------|
| | | | TOP PLATE DIMENSIONS A x B (mm) | BASE PLATE DIMENSIONS C x D (mm) | BRG HEIGHT H (mm) | ROTATION SHORT R _S (rad.) | ROTATION LONG R _L (rad.) | CENTRES TOP V x W (mm) | CENTRES BOTTOM Y x W (mm) | BOLT SIZE (GRADE 8.8) (C / W NUT) |
| BGS(20)-100-0/40 | 100 | 20 | 165 x 225 | 160 x 145 | 59 | 0.028 | 0.018 | 100 x 150 | 100 x 100 | 8 x M16 x 100 |
| BGS(20)-200-0/40 | 200 | 40 | 205 x 265 | 200 x 185 | 59 | 0.019 | 0.014 | 140 x 180 | 130 x 130 | 8 x M16 x 100 |
| BGS(20)-300-0/40 | 300 | 60 | 230 x 320 | 225 x 220 | 65 | 0.022 | 0.016 | 160 x 200 | 150 x 150 | 8 x M20 x 100 |
| BGS(20)-400-0/40 | 400 | 80 | 245 x 360 | 240 x 260 | 75 | 0.020 | 0.013 | 170 x 225 | 160 x 160 | 8 x M20 x 100 |
| BGS(20)-500-0/40 | 500 | 100 | 255 x 405 | 250 x 300 | 80 | 0.025 | 0.015 | 180 x 250 | 170 x 170 | 8 x M24 x 125 |
| BGS(20)-600-0/40 | 600 | 120 | 285 x 425 | 280 x 320 | 80 | 0.021 | 0.014 | 200 x 280 | 180 x 180 | 8 x M24 x 125 |

Series "B(20)" Structural Slide Bearings

Granor / Graflon / PTFE Structural Slide Bearings combine the advantages of Graflon PTFE material with those of a Grafab fabric elastomeric bearing pad thus providing the design engineer with a simple, low cost, functional structural bearing suitable for use on corbels and columns where continuous type Slipjoint slide bearing may be appropriate.

Bearing Identification –

The three prefixes of the basic types (BFP, BGS, BFX) is followed by rated working load capacity in kN.

Thereafter, movement either lateral or longitudinal is shown – eg: BGS(20)-100-0/40.

- BGS(20) – Series / Style / construction.
- 100 Rated vertical working load. kN
- 0/ Movement – lateral – \pm from neutral.
- /40 Movement longitudinal \pm from neutral.

Where non standard movement capacity is required, it can be described by modification to the standard part number. eg: If ± 50 mm required, above part number becomes – BGS – 100 – 0/50

Materials –

Series 'B' Graflon / PTFE Slide Bearings typically use the following materials –

- Graflon Grade 1 or Grade 2 PTFE.
- Stainless Steel Grade 316 to AS-1449, polished.
- Elastomeric pad – Grafab, fabric reinforced.
- Top & Bottom plate – M.S. to AS-3678 Gr. 250.
- Grout Bolts – To AS-1112, Grade 8.8 Galvanised.

Rotational Capacity –

The Grafab, preformed fabric reinforced elastomeric pad used in the Series B Structural Slide Bearings, acts in a similar manner to any elastomeric bridge bearing pad. Rotational capacities – achieved under full rated working load – are as detailed in the tables. Increased rotational values – achieved by a thicker Grafab pad, are available – please consult Granor.

Special Bearings –

Bearings with requirements outside those shown in this brochure, can be provided including increased sliding capacity, increased rotational capacity, removable bearings insulated bearings for 'hot' applications are also available.

Corrosion Protection –

Hot Dip Gal to AS/NZS4680;1999, alternatively, Grit Blast to AS-1627, Class 3, and 75um Zinc-Silicate primer, followed by customers' top coat requirement.

Lateral Restraint –

For the BGS(20) Guided/Slide bearings, and the BFX Fixed bearings, working lateral restraint capacity is set at 20% of the rated vertical working load. Bearings with increased lateral restraint are available. Please consult Granor.

Sliding Capacity –

Standard movement capacities are as detailed in attached tabulations of bearing characteristics. These are \pm from neutral position. Increased slide capacity is available. Refer to Bearing Identification for details.

Removable Bearings –

If it is required that the bearings be removable, then by the addition of extra top and bottom plates, plus modification to the standard configuration, the Graflon PTFE Series 'B' bearings can be designed for 'removal.'

Installation –

There is no one simple 'best solution' to install any of our Graflon PTFE Structural Slide Bearings. We find that most applications are project specific and require some input from GRANOR. However, installation is usually very simple. Detailed instructions are included with every delivery.

Generally these bearings are installed by either, grouting into concrete, or by tack or circumferential welding. Grout bolts are supplied as standard, unless welded installation is nominated. Removable bearings may have a combination of above. Such designs are available from Granor.