

# MECHANICAL / STRUCTURAL BEARINGS

## GRANOR® STRUCTURAL BEARINGS – “SERIES B”

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.



# GRANOR® GRAFLON®

## STRUCTURAL BEARINGS SERIES B

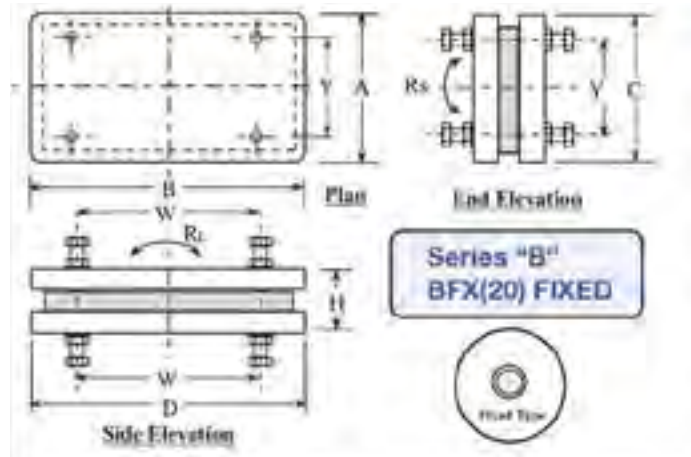
### GRAFLON STRUCTURAL BEARINGS – SERIES “B” FIXED – STRUCTURAL TYPE BFX(20)

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 SHORT $R_L$ (rad.)	GROUT BOLT CENTRES TOP & BOTTOM Y x W (mm)	GROUT BOLT DETAILS (C/W NUT) (GRADE 8.8)
<b>BFX(20)-100-0/0</b>	100	20	100 x 170	100 x 170	53	0.028	0.015	70 x 115	8 x M16 x 100
<b>BFX(20)-200-0/0</b>	200	40	140 x 210	140 x 210	53	0.019	0.012	95 x 140	8 x M16 x 100
<b>BFX(20)-300-0/0</b>	300	60	165 x 245	165 x 245	69	0.022	0.014	110 x 165	8 x M20 x 100
<b>BFX(20)-400-0/0</b>	400	80	180 x 280	180 x 280	69	0.020	0.012	120 x 190	8 x M20 x 100

# GRANOR® GRAFLON®

## STRUCTURAL BEARINGS SERIES B

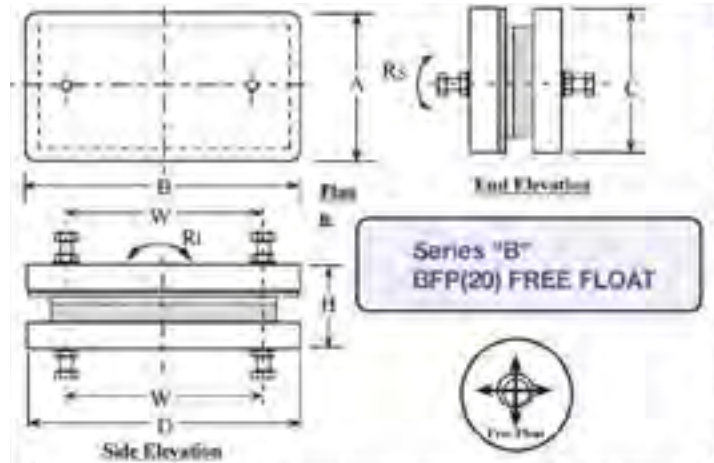
### GRAFLON STRUCTURAL BEARINGS - SERIES "B" FREE FLOAT - STRUCTURAL TYPE BFP(20)

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 <sub>s</sub> (rad.)	ROTATION SHORT R <sub>L</sub> (rad.)	GROUT BOLT CENTRES W (mm)	GROUT BOLT DETAILS (GRADE 8.8) (C/W NUT)
<b>BFP(20)-100-25/40</b>	100	165 x 180	165 x 180	50	0.028	0.015	100	4 x M16 x 100
<b>BFP(20)-200-25/40</b>	200	205 x 220	205 x 220	50	0.019	0.014	140	4 x M16 x 100
<b>BFP(20)-300-25/40</b>	300	230 x 250	230 x 255	65	0.022	0.016	170	4 x M16 x 100
<b>BFP(20)-400-25/40</b>	400	245 x 295	245 x 295	65	0.020	0.013	210	4 x M16 x 100
<b>BFP(20)-500-25/40</b>	500	255 x 335	255 x 335	70	0.025	0.015	250	4 x M16 x 100
<b>BFP(20)-600-25/40</b>	600	285 x 355	285 x 355	70	0.021	0.014	270	4 x M16 x 100

# GRANOR® GRAFLON®

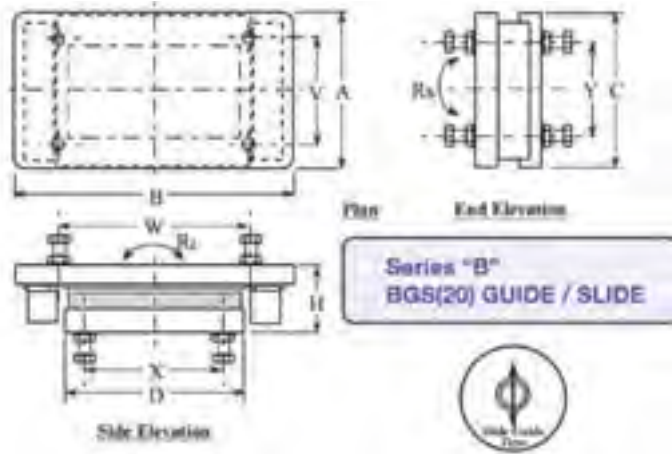
## STRUCTURAL BEARINGS SERIES B

### GRAFLON STRUCTURAL BEARINGS - SERIES B - GUIDE/SLIDE - STRUCTURAL TYPE BGS(20)

The Graflon Type BGS(20) Structural Bearings provide as standard, +/-40mm 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. When a steel connection is required, designer should nominate stud size, guide 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 SHORT $R_L$ (rad.)	CENTRES TOP V x W (mm)	CENTRES BOTTOM Y x X (mm)	BOLT SIZE (GRADE 8.8) (C/W NUT)
<b>BGS(20)-100-0/40</b>	100	20	165 x 225	160 x 145	59	0.028	0.018	100 x 150	100 x 100	8 x M16 x 100
<b>BGS(20)-200-0/40</b>	200	40	205 x 265	200 x 185	59	0.019	0.014	140 x 180	130 x 130	8 x M16 x 100
<b>BGS(20)-300-0/40</b>	300	60	230 x 320	225 x 220	65	0.022	0.016	160 x 200	150 x 150	8 x M20 x 100
<b>BGS(20)-400-0/40</b>	400	80	245 x 360	240 x 260	75	0.020	0.013	170 x 225	160 x 160	8 x M20 x 100
<b>BGS(20)-500-0/40</b>	500	100	255 x 405	250 x 300	80	0.025	0.015	180 x 250	170 x 170	8 x M24 x 125
<b>BGS(20)-600-0/40</b>	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" 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 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.
- > /40 Movement – longitudinal - +/- 40 mm from neutral.

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

## MATERIALS USED

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-1252, 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;2006, 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 +/- 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, bolting to structural steel, or by casting into concrete. Gr 8.8 HSS studs are supplied as standard, unless welded installation is nominated.

When welding always consult with a Granor representative prior to installation. Removable bearings may have a combination of above. Such designs are available from Granor using an additional attachment plate.