

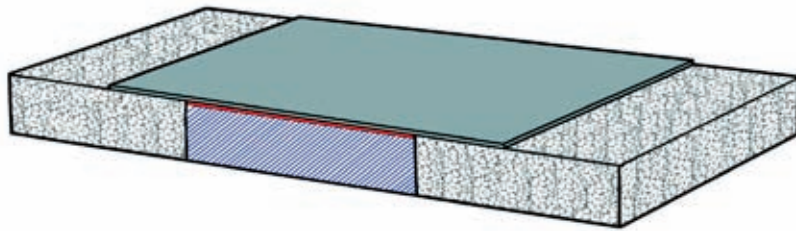
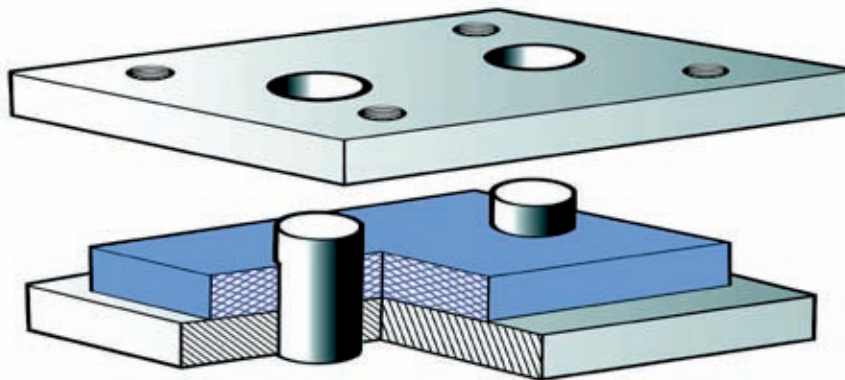
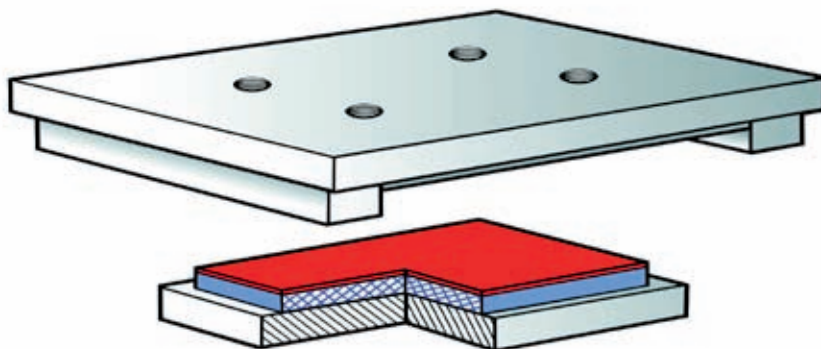


Hercules Engineering Australia

Incorporated by

Cut to Size Plastics Pty Ltd

2016 - VERSION C



PRODUCT CATALOGUE

Issue C: May 2016

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Cut to Size Plastics Pty Ltd

We will supply, cut to size,
machine or fabricate the finest
engineering plastics to your
specifications.

Hercules Engineering Australia

Manufacturers and suppliers of
Hercules composite slip joints,
and the Herculon range of
structural bearings.

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Catalogue produced in Australia by:

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Application

Hercuslip Composite (HSC) has been developed to fill the need for a reliable, easily applied slipjoint material on load bearing brickwork and under concrete slabs (see Fig 1-1). It is specifically designed to centralise loads and accommodate initial shrinkage and subsequent thermal movement. It is ideal for post-tensioned and cast in-situ slabs.

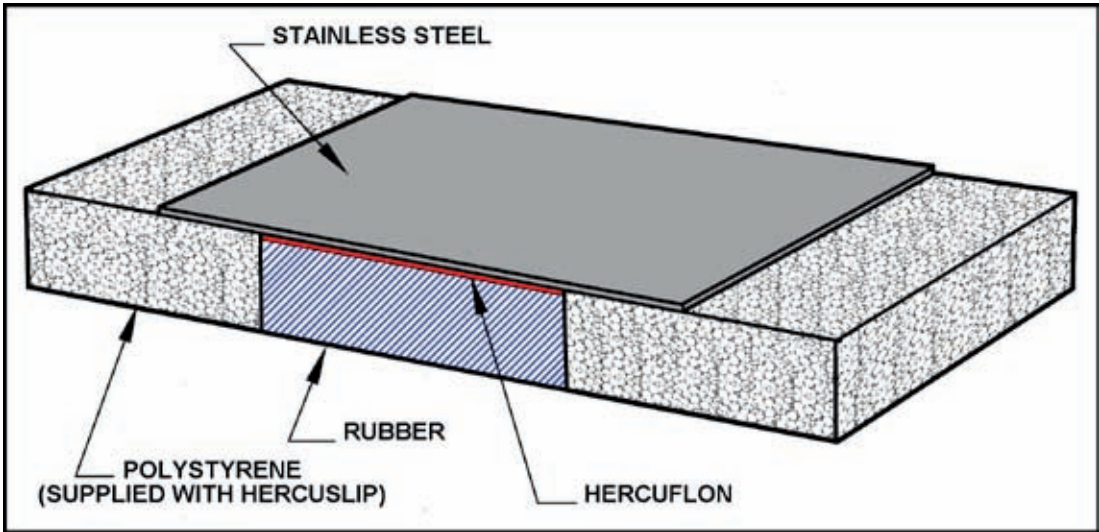


Fig 1-1 Hercuslip Composite

Materials

HSC consists of a stainless steel sheet sliding against a *Hercuflon* coated natural rubber strip, blocked out either side with polystyrene spacer strips.

Types

Five basic types of *HSC* are available (see Table 1-1). Each of these types can be provided in a variety of overall widths and expansion capacities.

Table 1-1 Types of Hercuslip Composite

Type	Slipjoint Thickness (mm)	Hercuflon/ Rubber Width (mm)	Max. Working Load (kN/m)	Max. Rotation (rads)
HSC/1	7	25	100	0.046
HSC/2	7	50	200	0.033
HSC/3	7	75	300	0.020
HSC/4	7	100	400	0.013
HSC/5	7	125	500	0.010

Design

- The following design limitations are recommended:
- Coefficient of friction 0.06 - 0.07.
  - Expansion capacity up to ± 60 mm (larger expansions can be arranged if required).
  - Load capacities available (see Table 1-1 for Max. Working Load per type).

NOTE

HSC is primarily designed for use as a continuous slipjoint under cast in-situ slabs. In some cases it may be convenient to use it in small lengths. If these lengths are less than 200 mm, the material may become overloaded. In this case it may be better to use a

small Herculon Bearing. The standard material should NOT be used under pre-cast elements, a modified version being available for this situation. If in any doubt, please contact our Technical Department.

Installation

The HSC should be installed as shown in Fig 1-2 and in accordance with the following instructions:

- 1. Prepare the concrete seating, brick or blockwork with a wood float mortar finish so that it is reasonably level over the complete length of the strip. A metre straight edge should show no more than 3 mm variation in level along its length.
- 2. Hold the HSC in position with *Hercules Adhesive Type HBA* (a small amount at either end is sufficient), and mask the butt joints with adhesive tape.

NOTE

***Hercules Adhesive* is available in 300 gram cartridges. Each cartridge will provide enough adhesive to cover 25 metres of strip.**

- 3. Ensure that the corbel or seating is completely covered with slipjoint or polystyrene so that there is no chance of concrete *shorting out* the slipjoint during the pour.
- 4. Pour concrete, taking care not to damage the slipjoint. Direct blows with shovels, footware or vibrators should be avoided. Tape over any damaged polystyrene.

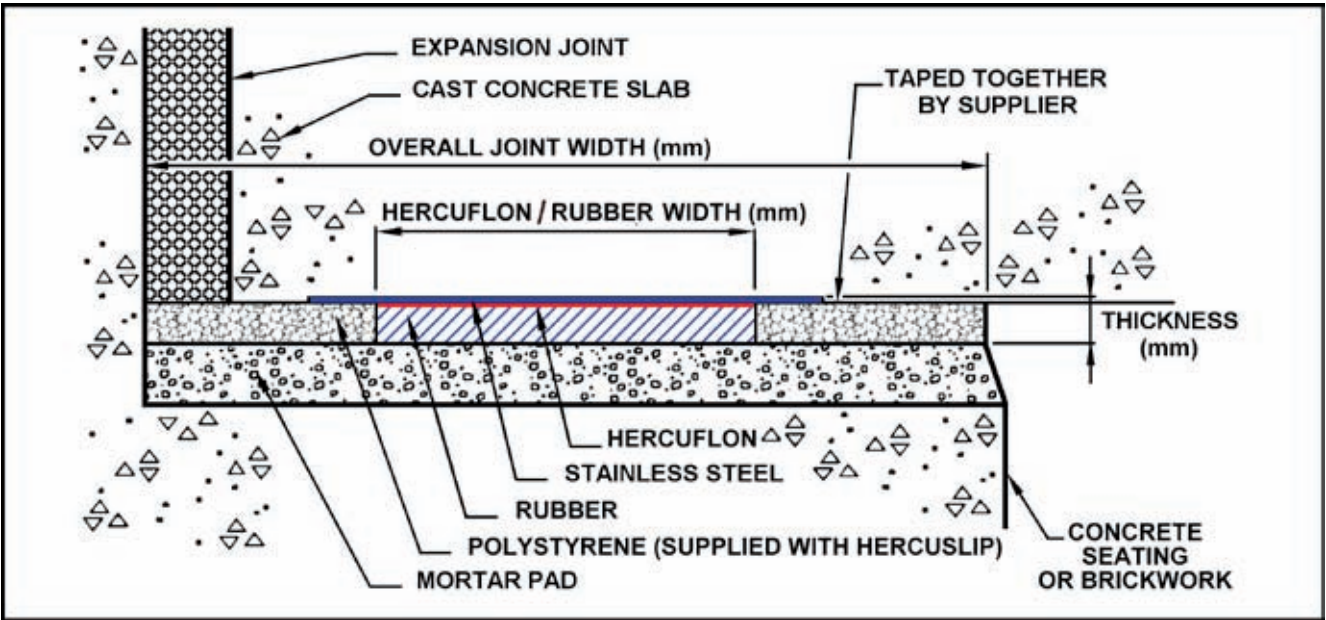


Fig 1-2 Installation of Hercuslip Composite

Ordering

The HSC is normally supplied in one metre lengths. If shorter lengths are required we recommend having these cut to length in our factory. Table 1-2 details the types and sizes of HSC. The part number is made up as follows:

HSC/1/130/10 which equates to:

HSC - *Hercuslip Composite*

1 - *Hercuslip* type

130 - Overall joint width (mm)

10 - Expansion capacity (± mm)

Table 1-2 Part Numbers for Hercuslip Composite (Other Widths Available)

Type	Overall Joint Width	5	10	15	20	30	40	50	60
HSC/1	75	HSC/1/75/5	HSC/1/75/10	HSC/1/75/15	HSC/1/75/20	N/A	N/A	N/A	N/A
	85	HSC/1/85/5	HSC/1/85/10	HSC/1/85/15	HSC/1/85/20	N/A	N/A	N/A	N/A
	100	HSC/1/100/5	HSC/1/100/10	HSC/1/100/15	HSC/1/100/20	HSC/1/100/30	N/A	N/A	N/A
	110	HSC/1/110/5	HSC/1/110/10	HSC/1/110/15	HSC/1/110/20	HSC/1/110/30	N/A	N/A	N/A
	130	HSC/1/130/5	HSC/1/130/10	HSC/1/130/15	HSC/1/130/20	HSC/1/130/30	HSC/1/130/40	N/A	N/A
	150	HSC/1/150/5	HSC/1/150/10	HSC/1/150/15	HSC/1/150/20	HSC/1/150/30	HSC/1/150/40	HSC/1/150/50	N/A
	180	HSC/1/180/5	HSC/1/180/10	HSC/1/180/15	HSC/1/180/20	HSC/1/180/30	HSC/1/180/40	HSC/1/180/50	HSC/1/180/60
	200	HSC/1/200/5	HSC/1/200/10	HSC/1/200/15	HSC/1/200/20	HSC/1/200/30	HSC/1/200/40	HSC/1/200/50	HSC/1/200/60
	230	HSC/1/230/5	HSC/1/230/10	HSC/1/230/15	HSC/1/230/20	HSC/1/230/30	HSC/1/230/40	HSC/1/230/50	HSC/1/230/60
		HSC/2/100/5	HSC/2/100/10	HSC/2/100/15	HSC/2/100/20	N/A	N/A	N/A	N/A
HSC/2	110	HSC/2/110/5	HSC/2/110/10	HSC/2/110/15	HSC/2/110/20	N/A	N/A	N/A	N/A
	130	HSC/2/130/5	HSC/2/130/10	HSC/2/130/15	HSC/2/130/20	HSC/2/130/30	N/A	N/A	N/A
	150	HSC/2/150/5	HSC/2/150/10	HSC/2/150/15	HSC/2/150/20	HSC/2/150/30	N/A	N/A	N/A
	180	HSC/2/180/5	HSC/2/180/10	HSC/2/180/15	HSC/2/180/20	HSC/2/180/30	HSC/2/180/40	N/A	N/A
	200	HSC/2/200/5	HSC/2/200/10	HSC/2/200/15	HSC/2/200/20	HSC/2/200/30	HSC/2/200/40	HSC/2/200/50	HSC/2/200/60
	230	HSC/2/230/5	HSC/2/230/10	HSC/2/230/15	HSC/2/230/20	HSC/2/230/30	HSC/2/230/40	HSC/2/230/50	HSC/2/230/60
	250	HSC/2/250/5	HSC/2/250/10	HSC/2/250/15	HSC/2/250/20	HSC/2/250/30	HSC/2/250/40	HSC/2/250/50	HSC/2/250/60
	270	HSC/2/270/5	HSC/2/270/10	HSC/2/270/15	HSC/2/270/20	HSC/2/270/30	HSC/2/270/40	HSC/2/270/50	HSC/2/270/60
	300	HSC/2/300/5	HSC/2/300/10	HSC/2/300/15	HSC/2/300/20	HSC/2/300/30	HSC/2/300/40	HSC/2/300/50	HSC/2/300/60
		HSC/2/100/5	HSC/2/100/10	HSC/2/100/15	HSC/2/100/20	N/A	N/A	N/A	N/A

Table 1-2 Part Numbers for Hercuslip Composite (Other Widths Available)

Type	Overall Joint Width	5	10	15	20	30	40	50	60
HSC/3	130	HSC/3/130/5	HSC/3/130/10	HSC/3/130/15	HSC/3/130/20	N/A	N/A	N/A	N/A
	150	HSC/3/150/5	HSC/3/150/10	HSC/3/150/15	HSC/3/150/20	N/A	N/A	N/A	N/A
	180	HSC/3/180/5	HSC/3/180/10	HSC/3/180/15	HSC/3/180/20	HSC/3/180/30	HSC/3/180/40	N/A	N/A
	200	HSC/3/200/5	HSC/3/200/10	HSC/3/200/15	HSC/3/200/20	HSC/3/200/30	HSC/3/200/40	HSC/3/200/50	N/A
	230	HSC/3/230/5	HSC/3/230/10	HSC/3/230/15	HSC/3/230/20	HSC/3/230/30	HSC/3/230/40	HSC/3/230/50	HSC/3/230/60
	250	HSC/3/250/5	HSC/3/250/10	HSC/3/250/15	HSC/3/250/20	HSC/3/250/30	HSC/3/250/40	HSC/3/250/50	HSC/3/250/60
	300	HSC/3/300/5	HSC/3/300/10	HSC/3/300/15	HSC/3/300/20	HSC/3/300/30	HSC/3/300/40	HSC/3/300/50	HSC/3/300/60
HSC/4	350	HSC/3/350/5	HSC/3/350/10	HSC/3/350/15	HSC/3/350/20	HSC/3/350/30	HSC/3/350/40	HSC/3/350/50	HSC/3/350/60
	150	HSC/4/150/5	HSC/4/150/10	N/A	N/A	N/A	N/A	N/A	N/A
	180	HSC/4/180/5	HSC/4/180/10	HSC/4/180/15	HSC/4/180/20	N/A	N/A	N/A	N/A
	200	HSC/4/200/5	HSC/4/200/10	HSC/4/200/15	HSC/4/200/20	HSC/4/200/30	N/A	N/A	N/A
	230	HSC/4/230/5	HSC/4/230/10	HSC/4/230/15	HSC/4/230/20	HSC/4/230/30	HSC/4/230/40	HSC/4/230/50	N/A
	250	HSC/4/250/5	HSC/4/250/10	HSC/4/250/15	HSC/4/250/20	HSC/4/250/30	HSC/4/250/40	HSC/4/250/50	HSC/4/250/60
	300	HSC/4/300/5	HSC/4/300/10	HSC/4/300/15	HSC/4/300/20	HSC/4/300/30	HSC/4/300/40	HSC/4/300/50	HSC/4/300/60
HSC/5	350	HSC/4/350/5	HSC/4/350/10	HSC/4/350/15	HSC/4/350/20	HSC/4/350/30	HSC/4/350/40	HSC/4/350/50	HSC/4/350/60
	400	HSC/4/400/5	HSC/4/400/10	HSC/4/400/15	HSC/4/400/20	HSC/4/400/30	HSC/4/400/40	HSC/4/400/50	HSC/4/400/60
	180	HSC/5/180/5	HSC/5/180/10	N/A	N/A	N/A	N/A	N/A	N/A
	200	HSC/5/200/5	HSC/5/200/10	HSC/5/200/15	HSC/5/200/20	N/A	N/A	N/A	N/A
	230	HSC/5/230/5	HSC/5/230/10	HSC/5/230/15	HSC/5/230/20	HSC/5/230/30	HSC/5/230/40	N/A	N/A
	250	HSC/5/250/5	HSC/5/250/10	HSC/5/250/15	HSC/5/250/20	HSC/5/250/30	HSC/5/250/40	HSC/5/250/50	N/A
	300	HSC/5/300/5	HSC/5/300/10	HSC/5/300/15	HSC/5/300/20	HSC/5/300/30	HSC/5/300/40	HSC/5/300/50	HSC/5/300/60
	350	HSC/5/350/5	HSC/5/350/10	HSC/5/350/15	HSC/5/350/20	HSC/5/350/30	HSC/5/350/40	HSC/5/350/50	HSC/5/350/60
	400	HSC/5/400/5	HSC/5/400/10	HSC/5/400/15	HSC/5/400/20	HSC/5/400/30	HSC/5/400/40	HSC/5/400/50	HSC/5/400/60

Application

Hercules Shearstrip (HSS) has been developed to fill the need for a reliable, economical bearing strip under short span cast concrete slabs (see Fig 1-3). It is designed to centralise loads and accomodate very small movements.

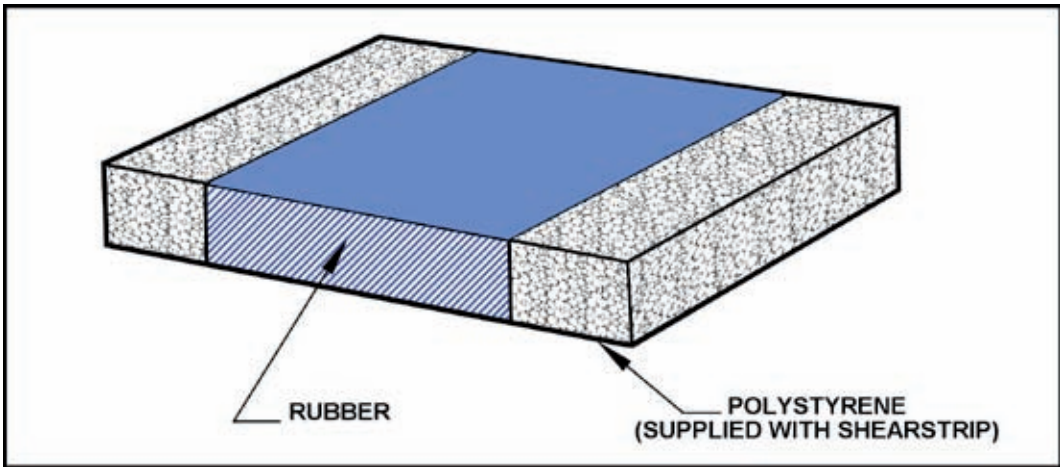


Fig 1-3 Hercules Shearstrip

Materials

HSS consists of a natural rubber strip blocked out either side with expanded polystyrene spacer strips taped top and bottom with adhesive tape.

Types

Six basic types of *HSS* are available as detailed in Table 1-3. Each of these types can be provided in a variety of overall widths (see Table 1-4).

Table 1-3 Types of Hercules Shearstrip

Type	Thickness	Rubber Width (mm)	Max. Working Load (kN/m)	Max. Rotation (rads)	Shear Capacity (± mm)
HSS/1	6	25	100	0.046	2.0
HSS/2	6	50	200	0.033	2.0
HSS/3	6	75	300	0.020	2.0
HSS/4	6	100	400	0.013	2.0
HSS/5	6	125	500	0.010	2.0
HSS/6	6	150	600	0.008	2.0

Design

The design limitations detailed in Table 1-3 are recommended.

Installation

HSS should be installed as shown in Fig 1-4 and in accordance with the following instructions:

1. Prepare the concrete seating brick or blockwork with a wood float mortar finish so that it is reasonably level over the complete length of the strip. A metre straight edge should show no more than 3 mm variation in level along its length.
2. Lay the *HSS* in position and cut mitre joints where the strip changes direction (this can be done using a sharp knife).
3. Hold the *HSS* in position with *Hercules Adhesive* and mask the butt joints with adhesive tape, ensuring that there are no concrete *shorts*.

NOTE

***Hercules Adhesive* is available in 300 gram cartridges. Each cartridge will provide enough adhesive to cover 25 metres of strip.**

4. Pour concrete, taking care not to damage the shearstrip. Direct blows with shovels, footwear or vibrators should be avoided. Tape over any damaged polystyrene.

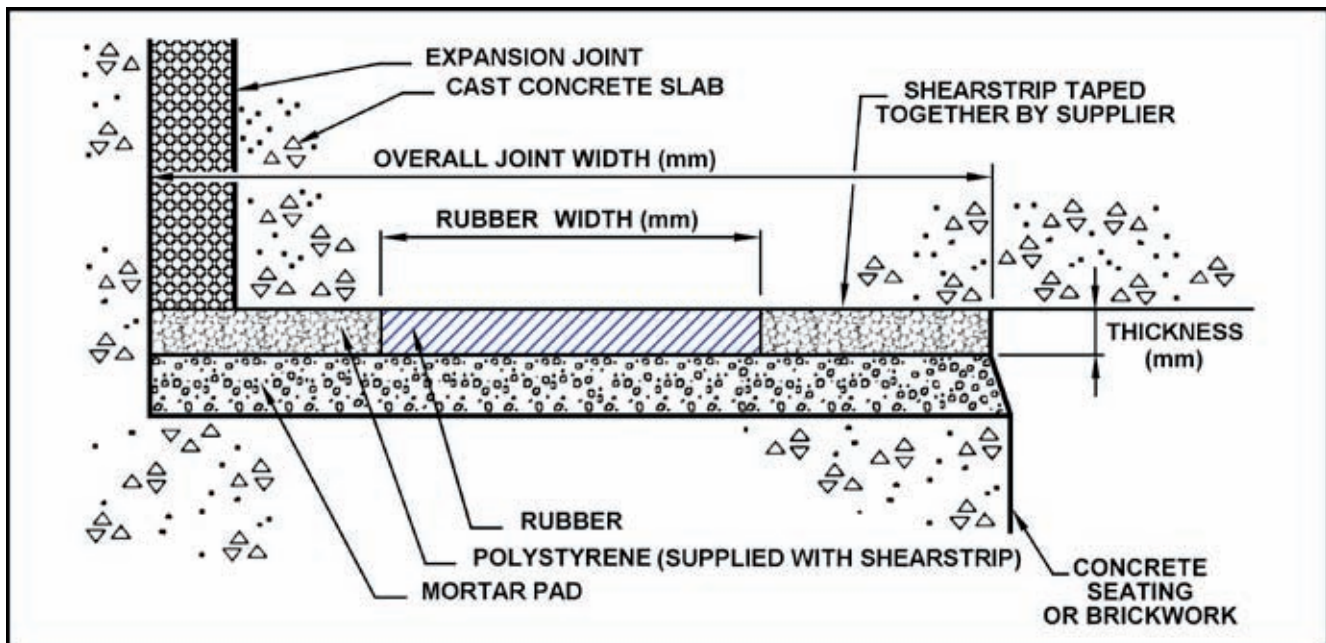


Fig 1-4 Installation of Hercules Shearstrip

Ordering

Table 1-4 details the types and sizes of *HSS*. The part number is made up as follows:
HSS/1/130 which equates to:
HSS - Hercules Shearstrip
1 - *Hercules Shearstrip* type
130 - Overall joint width (mm)

Type	Overall Joint Width (mm)	Part No.	Type	Overall Joint Width (mm)	Part No.
HSS/1	75	HSS/1/75	HSS/2	100	HSS/2/100
	85	HSS/1/85		110	HSS/2/110
	100	HSS/1/100		130	HSS/2/130
	110	HSS/1/110		150	HSS/2/150
	130	HSS/1/130		180	HSS/2/180
	150	HSS/1/150		200	HSS/2/200
	180	HSS/1/180		230	HSS/2/230
	200	HSS/1/200		250	HSS/2/250
	230	HSS/1/230		270	HSS/2/270
HSS/3	130	HSS/3/130	HSS/4	150	HSS/4/150
	150	HSS/3/150		180	HSS/4/180
	180	HSS/3/180		200	HSS/4/200
	200	HSS/3/200		230	HSS/4/230
	230	HSS/3/230		250	HSS/4/250
	250	HSS/3/250		300	HSS/4/300
	300	HSS/3/300		350	HSS/4/350
	350	HSS/3/350		400	HSS/4/400
HSS/5	180	HSS/5/180	HSS/6	180	HSS/6/180
	200	HSS/5/200		200	HSS/6/200
	230	HSS/5/230		230	HSS/6/230
	250	HSS/5/250		250	HSS/6/250
	300	HSS/5/300		300	HSS/6/300
	350	HSS/5/350		350	HSS/6/350
	400	HSS/5/400		400	HSS/6/400

Hercuslip
Composite

Table 1-5 Approximate Shipping Weights for Hercuslip Composite

Part No.	kg/m	Part No.	kg/m	Part No.	kg/m
HSC/1/110/5	0.4	HSC/1/110/20	0.4	HSC/1/110/50	0.6
HSC/2/110/5	0.6	HSC/2/110/20	0.7	HSC/2/110/50	0.9
HSC/3/110/5	0.9	HSC/3/110/20	0.9	HSC/3/110/50	1.2
HSC/4/110/5	1.1	HSC/4/110/20	1.2	HSC/4/110/50	1.5
HSC/5/110/5	1.4	HSC/5/110/20	1.5	HSC/5/110/50	1.7

Hercules
Shearstrip

Table 1-6 Approximate Shipping Weights for Hercules Shearstrip

Type	kg/m	Type	kg/m
HSS/1	0.25	HSS/2	0.5
HSS/3	0.75	HSS/4	1.0
HSS/5	1.25	HSS/6	1.5

Application

Hercules Galvanized or Stainless Steel Grease Slipjoints (HGSJ) or (HSSJ) is the cheaper alternative to Hercuslip Composite Slipjoints (HSC). It is easily applied slip joint material, used on load bearing brickwork and under concrete slabs (see Fig 1-6).

Unlike HSC, HGSJ and HSSJ are not designed to accommodate sliding face rotation of supported structures or to evenly distribute their weight. Most commonly Grease Slipjoints are used under cast in-situ concrete slabs and less critical structural components.

Grease Slipjoints is a temporary solution compare to the design life and reliability of Composite Slipjoints. HSSJs would last longer due to the better corrosion resistance of Stainless Steel material compare to HGSJs. Both types eventually will seize up as the Molybdenum Grease dries up. That will depend from the working environment and it is unavoidable. However we are using the best available Molybdenum Grease to extend the design life of Slipjoints.

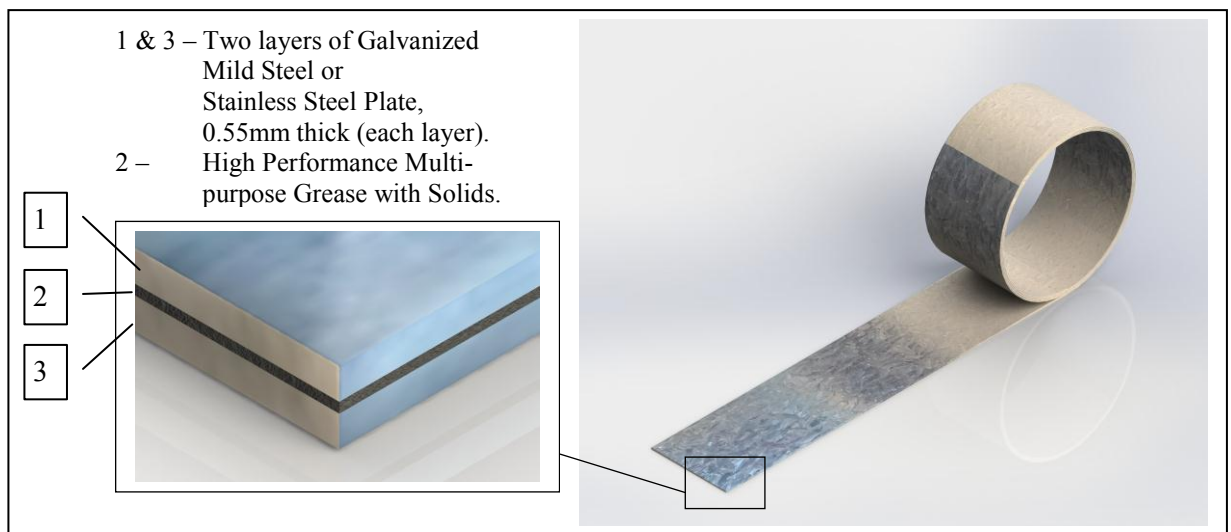


Fig 1-5 Grease Slipjoint

Materials

Grease Slipjoints consist of two layers of Galvanized Steel or Stainless Steel with Molybdenum Grease in-between for sliding and protection of sliding surfaces. Each Slipjoint is held together by tape. Grade 304 Stainless Steel is used for the regular slipjoints. Grade 316 SS is used in modified types for applications near the water or for the use in corrosive environments.

Types

Nine most commonly used types of HGSJ and HSSJ are represented in Table 1-7. Widths are reflected in the Part Number Types. Other widths are available upon request.

Table 1-7 Types of Hercules Grease Slipjoints

PART NUMBER	TYPE	HGSJ, kg/m (± 100 g)	HSSJ, kg/m (± 100 g)
HGSJ or HSSJ/90	FLAT	0.78	0.8
HGSJ or HSSJ /110	FLAT	0.95	0.97
HGSJ or HSSJ /150	FLAT	1.3	1.32
HGSJ or HSSJ /200	FLAT	1.73	1.76
HGSJ or HSSJ /230	FLAT	1.99	2.03
HGSJ or HSSJ /230(CB)	CAVITY BRIDGE	2.6	2.65
HGSJ or HSSJ /250	FLAT	2.16	2.2
HGSJ or HSSJ /250(CB)	CAVITY BRIDGE	2.77	2.83
HGSJ or HSSJ /270	FLAT	2.34	2.38
HGSJ or HSSJ /270(CB)	CAVITY BRIDGE	2.95	3
HGSJ or HSSJ /300	FLAT	2.6	2.64

Design

The following design limitations are recommended:

- Coefficient of friction* 0.04 (Zinc-Zinc) - 0.16 (Steel-Steel)
- Expansion capacity ± 2 to ± 5 mm
- Recommended contact stress** 100 – 150MPa
- Operating Temperature Range -25°C to +120°C (peak +130°C)
- Dropping Point for Grease +175°C

* Coefficient of friction has been obtained by comparison of several independent sources and it is an approximate value for greased surfaces of specified materials. A problem occurs with the value concerning the type of grease used. Considerations should be made in using this value until further notice.

** The recommended contact stress is a practical value range for common application scenarios. The ultimate load would be significantly higher in a range between 150-200MPa and it is limited by the Grease lubricating capacity and steel properties.

Installation

The HGSJ and HSSJ should be installed as shown on Fig 1-6 A&B and in accordance with the following instructions:

1. Prepare the brick or block work seating with a 10-12mm thick wood float mortar finish so that it is reasonably level over the complete length of the strip. A meter straight edge should not show more than 3mm variation in level along its length.
2. Hold the HGSJ or HSSJ in position with *Hercules Adhesive Type HBA* (a small amount at either end is sufficient), and mask the butt joints with adhesive tape.



NOTE

Hercules Adhesive is available in 300 gram cartridges. Each cartridge will provide enough adhesive to cover 25 metres of strip.

3. Pour concrete directly onto the top surface of the Grease Slipjoints.

A-Flat



Fig 1-6 Grease Slipjoints (A-Flat) (B-Cavity Bridge)
B-Cavity Bridge

B

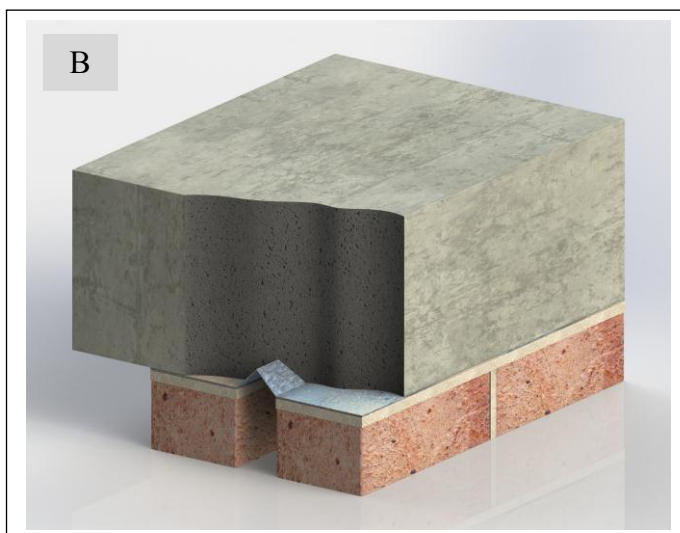


Fig 1-6 Grease Slipjoints (A-Flat) (B-Cavity Bridge)

Ordering

- Nine most commonly used types of HGSJ and HSSJ are represented in Table 1-7. Widths are reflected in the Part Number types.
- Small quantities (1-5 lengths) of HGSJ and HSSJ are supplied in rolls (approximately 300-500mm in diameter) on a small skid, except for the Cavity Bridge Types, they are always supplied flat.
- Medium and large quantities are supplied flat on a pallet in 3000 and 2400mm lengths accordingly.

SECTION 2 - HERCULON MODIFIED BEARINGS

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Herculon Modified Type D Bearing

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Application

Herculon Modified Type B (HLMB) Bearings (see Fig 2-1) have been developed to fulfil the need for a simple, low friction bearing on corbels and columns where a continuous slipjoint is inappropriate. They can be used under cast in-situ and post-tensioned slabs and beams.

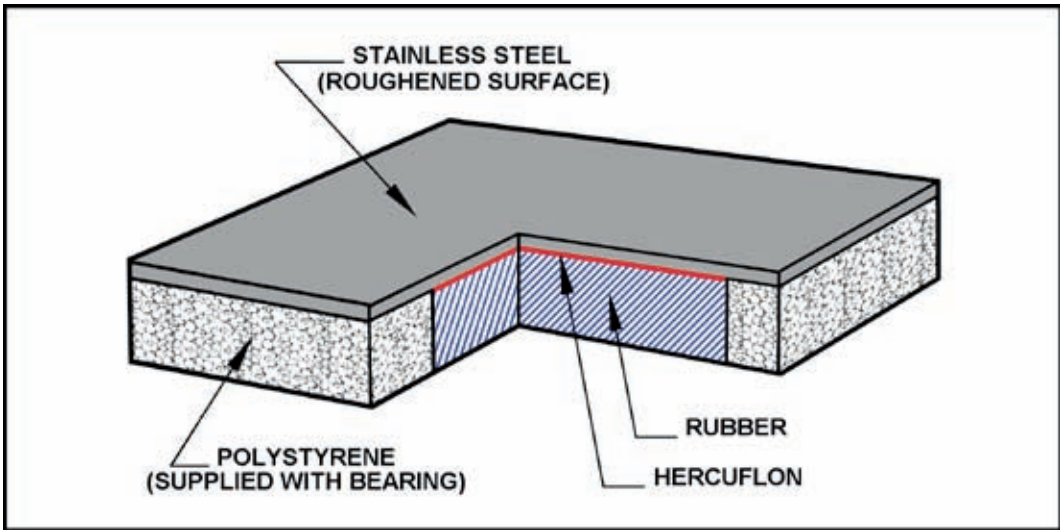


Fig 2-1 Herculon Modified Type B Bearing

Materials

HLMB bearings consist of a stainless steel top plate roughened on the upper surface and polished on the lower. This plate slides against a *Hercuflon* coated natural rubber pad that is bordered by polystyrene strips.

Types

There are two basic types of *HLMB* bearing available:

- Standard, and
- Seismic.

The seismic bearings are manufactured from the same materials as the standard bearings but they have greater all round expansion capacity (± 50 mm) to accommodate the larger movements which occur during seismic shock.

Design

The following design limitations are recommended:

- Coefficient of friction 0.06.
- Expansion capacity up to ± 20 mm (standard), up to ± 50 mm (seismic).
- Maximum contact stress 3 MPa.
- Maximum temperature 80°C .
- Maximum rotation up to 0.006 radians.



NOTE

Non standard bearings can be manufactured to accommodate larger expansions and differing rotations. The standard bearings should not be used under precast elements, a modified version being available for this situation. If in any doubt, please contact our Technical Department.

Installation

Fig 2-2 shows a *HLMB* bearing being cast into an in-situ roof slab. Before leaving our factory the bearing pad is blocked with polystyrene strips and the whole bearing assembly is sealed with paper tape. This tape excludes dirt and dust from the *Hercuflon* face and should not be removed.

The *HLMB* bearings should be installed as shown in Fig 2-2 and in accordance with the following instructions:

1. Prepare concrete seatings with a nominal 10 mm thick mortar pad with a wood float finish so that the level does not vary more than 2 mm from a straight edge placed in any direction across the seating. The horizontal plane of the seating should vary no more than 3 mm from the elevations shown on the plans.
2. Place the bearing in the position shown on the plans and cut any strips of polystyrene required for blocking out around the bearing.
3. Remove the bearing and the loose polystyrene strips and brush off any dust or grit.
4. Apply *Hercules Adhesive Type HBA* and bond into position.
5. Cover the joints between the bearing and polystyrene strips with polythene sheet or masking tape to prevent the ingress of concrete during the pour.
6. Pour concrete directly onto the roughened top surface of the stainless steel top plate.

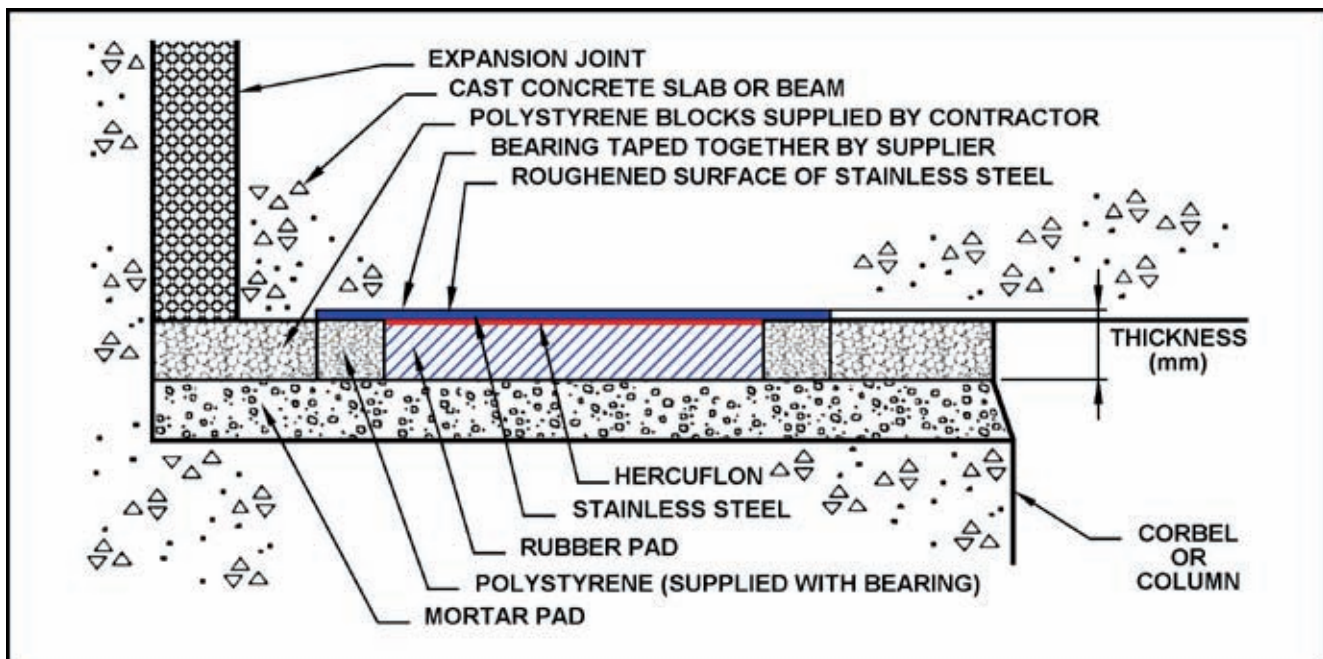


Fig 2-2 Installation of Herculon Modified Type B Bearing

Ordering

Table 2-1 (standard) and Table 2-2 (seismic) detail the range of sizes that are available. Fig 2-3 provides the dimension reference points reflected in the tables. Please contact our Technical Department if these sizes do not suit your requirements.

Table 2-1 Part Numbers for Standard Herculon Modified Type B Bearings

Part Number	Max. Vertical Working Load (kN)	Top Plate (mm) C x D (for ±20 mm expansion)	Rubber Pad (mm) A x B x E (for 0.006 rads rotation)	Overall Dimensions (mm) C X D x F (nominal)	Bearing Weight (kg)
HLMB/10	10	90 x 110 x 1.5	50 x 100 x 3	90 x 110 x 5	0.20
HLMB/25	25	115 x 160 x 1.5	75 x 150 x 6	115 x 160 x 8	0.35
HLMB/50	50	140 x 210 x 1.5	100 x 200 x 6	140 x 210 x 8	0.50
HLMB/75	75	160 x 250 x 1.5	120 x 240 x 6	160 x 250 x 8	0.70
HLMB/100	100	180 x 290 x 1.5	140 x 280 x 10	180 x 290 x 12	1.15
HLMB/125	125	195 x 320 x 1.5	155 x 310 x 10	195 x 320 x 12	1.40
HLMB/150	150	200 x 330 x 1.5	160 x 320 x 10	200 x 330 x 12	1.50
HLMB/175	175	210 x 350 x 1.5	170 x 340 x 10	210 x 350 x 12	1.65
HLMB/200	200	215 x 360 x 1.5	175 x 350 x 10	215 x 360 x 12	1.75
HLMB/225	225	230 x 390 x 1.5	190 x 380 x 10	230 x 390 x 12	2.05
HLMB/250	250	245 x 420 x 1.5	205 x 410 x 12	245 x 420 x 14	2.60
HLMB/275	275	255 x 440 x 1.5	215 x 430 x 12	255 x 440 x 14	2.90
HLMB/300	300	260 x 450 x 1.5	220 x 440 x 12	260 x 450 x 14	3.00
HLMB/325	325	265 x 460 x 1.5	225 x 450 x 12	265 x 460 x 14	3.10
HLMB/350	350	275 x 480 x 1.5	235 x 470 x 12	275 x 480 x 14	3.40
HLMB/375	375	285 x 500 x 1.5	245 x 490 x 12	285 x 500 x 14	3.65
HLMB/400	400	290 x 510 x 1.5	250 x 500 x 12	290 x 510 x 14	3.80
HLMB/425	425	295 x 530 x 1.5	255 x 520 x 12	295 x 530 x 14	4.00
HLMB/450	450	300 x 550 x 1.5	260 x 540 x 12	300 x 550 x 14	4.25
HLMB/475	475	310 x 570 x 1.5	270 x 560 x 12	310 x 570 x 14	4.55
HLMB/500	500	320 x 580 x 1.5	280 x 570 x 20	320 x 580 x 22	5.60
HLMB/525	525	330 x 590 x 1.5	290 x 580 x 20	330 x 590 x 22	5.90
HLMB/550	550	340 x 610 x 1.5	300 x 600 x 20	340 x 610 x 22	6.30
HLMB/575	575	345 x 620 x 1.5	305 x 610 x 20	345 x 620 x 22	6.50
HLMB/600	600	350 x 630 x 1.5	310 x 620 x 20	350 x 630 x 22	6.70



NOTE

Top plates are 1.5 mm thick stainless steel to AS 1449 (Grade 316)

HERCUFLON coating is 0.25 mm thick to AS 1195 (Grade B)

Natural rubber pad is 60° durometer

Table 2-2 Part Numbers for Seismic Herculon Modified Type B Bearings

Part Number	Max. Vertical Working Load (kN)	Top Plate (mm) C x D (for ±50 mm expansion in all directions)	Rubber Pad (mm) A x B x E (for 0.006 rads rotation)	Overall Dimensions (mm) C X D x F (nominal)	Bearing Weight (kg)
HLMB(SE)/10	10	150 x 200 x 1.5	50 x 100 x 3	150 x 200 x 5	0.40
HLMB(SE)/25	25	175 x 250 x 1.5	75 x 150 x 6	175 x 250 x 8	0.70
HLMB(SE)/50	50	200 x 300 x 1.5	100 x 200 x 6	200 x 300 x 8	0.95
HLMB(SE)/75	75	220 x 340 x 1.5	120 x 240 x 6	220 x 340 x 8	1.20
HLMB(SE)/100	100	240 x 380 x 1.5	140 x 280 x 10	240 x 380 x 12	1.70
HLMB(SE)/125	125	255 x 410 x 1.5	155 x 310 x 10	255 x 410 x 12	2.00
HLMB(SE)/150	150	260 x 420 x 1.5	160 x 320 x 10	260 x 420 x 12	2.10
HLMB(SE)/175	175	270 x 440 x 1.5	170 x 340 x 10	270 x 440 x 12	2.30
HLMB(SE)/200	200	275 x 450 x 1.5	175 x 350 x 10	275 x 450 x 12	2.40
HLMB(SE)/225	225	290 x 480 x 1.5	190 x 380 x 10	290 x 480 x 12	2.75
HLMB(SE)/250	250	305 x 510 x 1.5	205 x 410 x 12	305 x 510 x 14	3.30
HLMB(SE)/275	275	315 x 530 x 1.5	215 x 430 x 12	315 x 530 x 14	3.60
HLMB(SE)/300	300	320 x 540 x 1.5	220 x 440 x 12	320 x 540 x 14	3.75
HLMB(SE)/325	325	325 x 550 x 1.5	225 x 450 x 12	325 x 550 x 14	3.90
HLMB(SE)/350	350	335 x 570 x 1.5	235 x 470 x 12	335 x 570 x 14	4.15
HLMB(SE)/375	375	345 x 590 x 1.5	245 x 490 x 12	345 x 590 x 14	4.45
HLMB(SE)/400	400	350 x 600 x 1.5	250 x 500 x 12	350 x 600 x 14	4.70
HLMB(SE)/425	425	355 x 620 x 1.5	255 x 520 x 12	355 x 620 x 14	4.90
HLMB(SE)/450	450	360 x 640 x 1.5	260 x 540 x 12	360 x 640 x 14	5.10
HLMB(SE)/475	475	370 x 660 x 1.5	270 x 560 x 12	370 x 660 x 14	5.45
HLMB(SE)/500	500	380 x 670 x 1.5	280 x 570 x 20	380 x 670 x 22	6.50
HLMB(SE)/525	525	390 x 680 x 1.5	290 x 580 x 20	390 x 680 x 22	6.80
HLMB(SE)/550	550	400 x 700 x 1.5	300 x 600 x 20	400 x 700 x 22	7.25
HLMB(SE)/575	575	405 x 710 x 1.5	305 x 610 x 20	405 x 710 x 22	7.60
HLMB(SE)/600	600	410 x 720 x 1.5	310 x 620 x 20	410 x 720 x 22	7.85
 NOTE Top plates are 1.5 mm thick stainless steel to AS 1449 (Grade 316) HERCUFLON coating is 0.25 mm thick to AS 1195 (Grade B) Natural rubber pad is 60° durometer					

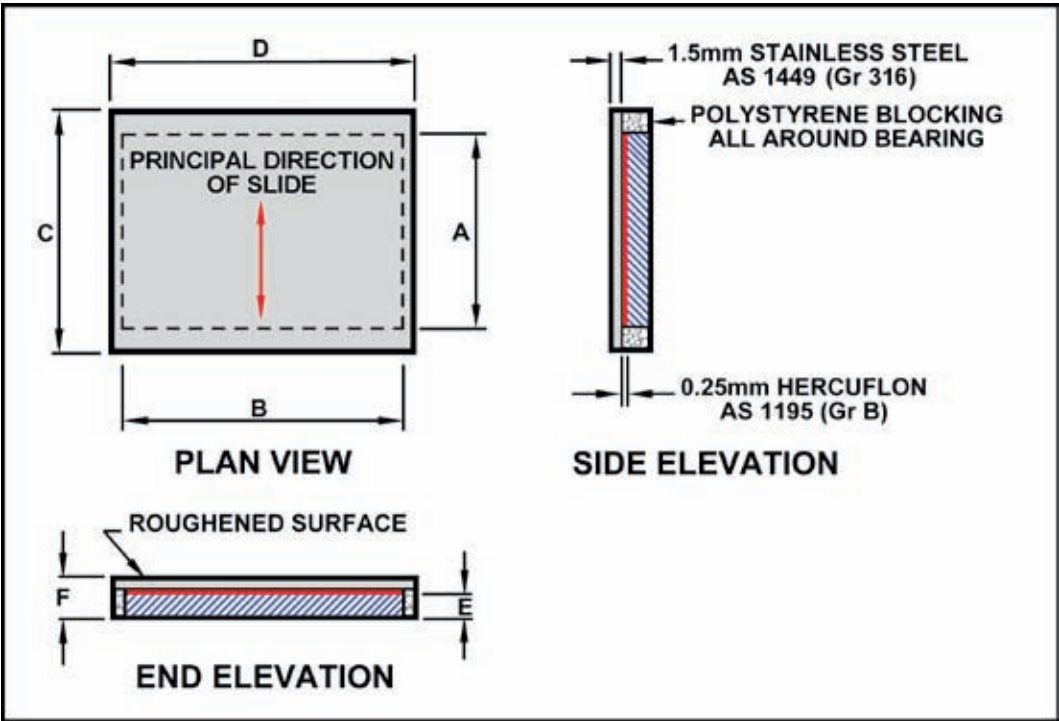


Fig 2-3 Dimension Reference Points

Application

Herculon Modified Type D (HLMD) Bearings (see Fig 2-4) have been developed to fulfil the need for a simple, low friction, highly stressed bearing on corbels and columns where a continuous slipjoint is inappropriate. They can be used under cast in-situ and post-tensioned slabs and beams.

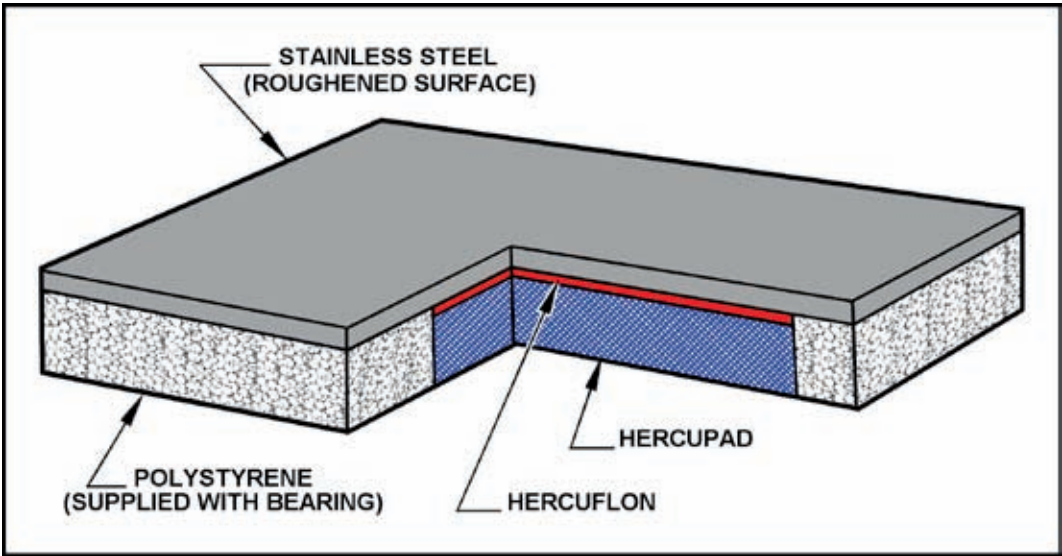


Fig 2-4 Herculon Modified Type D Bearing

Materials

HLMD bearings consist of a stainless steel top plate roughened on the upper surface and polished on the lower. This steel plate slides against a *Hercuflon* coated *Hercupad*.

Types

- There are two basic types of *HLMD* bearings available:
- Standard, and
  - Seismic.

The seismic bearings are manufactured from the same materials as the standard bearings but they have greater all round expansion capacity (± 50 mm) to accomodate the larger movements which occur during seismic shock.

Design

- The following design limitations are recommended:
- Coefficient of friction 0.05.
  - Expansion capacity up to ± 20 mm (standard), up to ± 50 mm all round (seismic).
  - Maximum contact stress 10 MPa.
  - Maximum temperature 80°C.
  - Maximum rotation up to 0.02 radians.

NOTE

Non standard bearings can be manufactured to accommodate larger expansions and differing rotations.

Installation

Fig 2-5 shows a *HLMD* bearing being cast into an in-situ roof slab. Before leaving our factory the bearing pad is blocked in with polystyrene strips, and the whole bearing assembly is sealed with paper tape. This tape excludes dirt and dust from the *Hercuflon* face and should not be removed.

The *HLMD* bearing should be installed as shown in Fig 2-5 and in accordance with the following instructions:

1. Prepare concrete seatings with a nominal 10 mm thick mortar pad with a wood float finish so that the level does not vary more than 2 mm from a straight edge placed in any direction across the seating. The horizontal plane of the seating should vary no more than 3 mm from the elevations shown on the plans.
2. Place the bearing in the position shown on the plans and cut any extra strips of expanded polystyrene required for blocking out around the bearing.
3. Remove the bearing and the loose polystyrene strips and brush off any dust or grit.
4. Apply *Hercules Adhesive Type HBA* and bond into position.
5. Cover the joints between the bearing and polystyrene strips with polythene sheet or masking tape to prevent the ingress of concrete during the pour.
6. Pour concrete directly onto the roughened top surface of the stainless steel top plate.

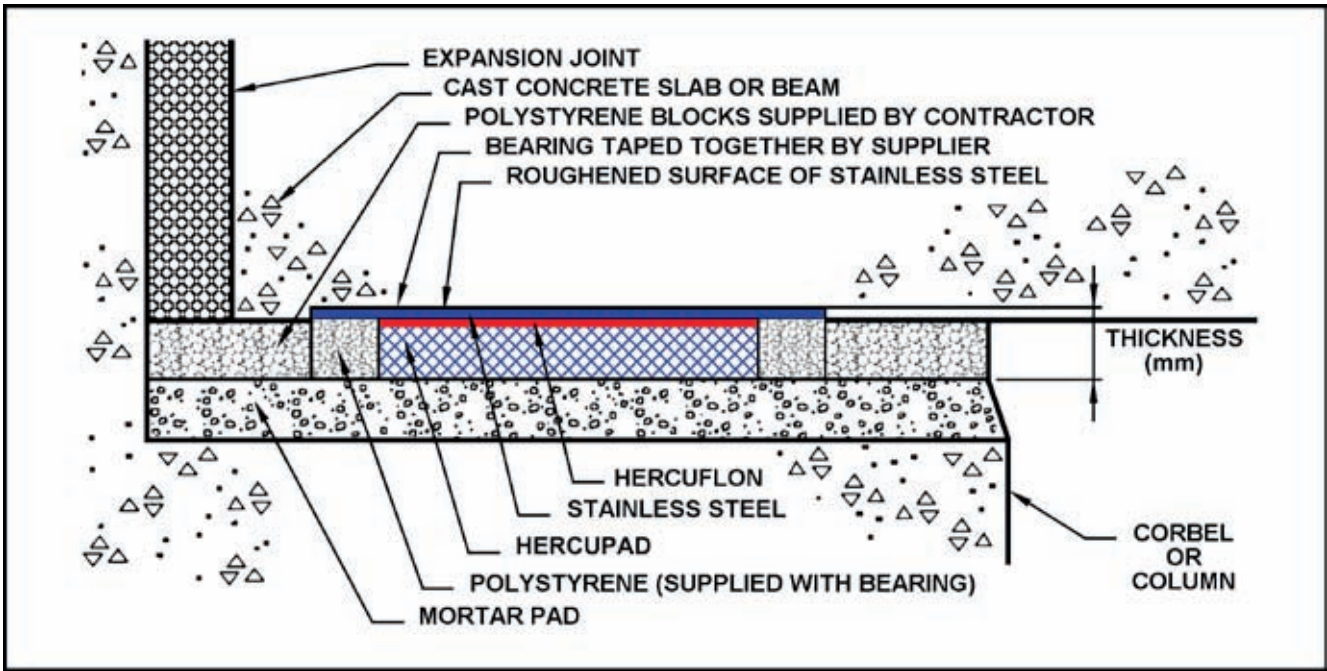


Fig 2-5 Installation of Herculon Modified Type D Bearing

Ordering

Table 2-3 (standard) and Table 2-4 (seismic) detail the range of sizes that are available. Figure 2-6 provides the dimension reference points reflected in the tables. Please contact our Technical Department if these sizes do not suit your requirements.

Table 2-3 Part Numbers for Standard Modified Type D Bearings

Part Number	Max. Vertical Working Load (kN)	Top Plate (mm) C x D (for ±20 mm expansion)	Rubber Pad (mm) A x B x E (for 0.02 rads rotation)	Overall Dimensions (mm) C X D x F (nominal)	Bearing Weight (kg)
HLMD/100	100	120 x 150 x 1.5	75 x 135 x 17	120 x 150 x 19	0.40
HLMD/150	150	145 x 165 x 1.5	100 x 150 x 17	145 x 165 x 19	0.60
HLMD/200	200	170 x 175 x 1.5	125 x 160 x 23	170 x 175 x 25	0.80
HLMD/250	250	180 x 205 x 1.5	135 x 190 x 23	180 x 205 x 25	1.20
HLMD/300	300	185 x 230 x 1.5	140 x 215 x 23	185 x 230 x 25	1.40
HLMD/350	350	195 x 250 x 1.5	150 x 235 x 29	195 x 250 x 31	1.80
HLMD/400	400	205 x 265 x 1.5	160 x 250 x 29	205 x 265 x 31	2.10
HLMD/450	450	215 x 285 x 1.5	170 x 270 x 29	215 x 285 x 31	2.60
HLMD/500	500	220 x 305 x 1.5	175 x 290 x 29	220 x 305 x 31	2.90
HLMD/550	550	235 x 310 x 1.5	190 x 295 x 29	235 x 310 x 31	3.20
HLMD/600	600	250 x 315 x 1.5	205 x 300 x 29	250 x 315 x 31	3.80

Table 2-4 Part Numbers for Seismic Modified Type D Bearings

Part Number	Max. Vertical Working Load (kN)	Top Plate (mm) C x D (for ±50 mm expansion in all directions)	Rubber Pad (mm) A x B x E (for 0.02 rads rotation)	Overall Dimensions (mm) C X D x F (nominal)	Bearing Weight (kg)
HLMD(SE)/100	100	175 x 235 x 1.5	75 x 135 x 17	175 x 235 x 19	0.70
HLMD(SE)/150	150	200 x 250 x 1.5	100 x 150 x 17	200 x 250 x 19	0.90
HLMD(SE)/200	200	225 x 260 x 1.5	125 x 160 x 23	225 x 260 x 25	1.20
HLMD(SE)/250	250	235 x 290 x 1.5	135 x 190 x 23	235 x 290 x 25	1.60
HLMD(SE)/300	300	240 x 315 x 1.5	140 x 215 x 23	240 x 315 x 25	1.80
HLMD(SE)/350	350	250 x 335 x 1.5	150 x 235 x 29	250 x 335 x 31	2.30
HLMD(SE)/400	400	260 x 250 x 1.5	160 x 250 x 29	260 x 350 x 31	2.50
HLMD(SE)/450	450	270 x 370 x 1.5	170 x 270 x 29	270 x 370 x 31	3.10
HLMD(SE)/500	500	275 x 390 x 1.5	175 x 290 x 29	275 x 390 x 31	3.40
HLMD(SE)/550	550	290 x 395 x 1.5	190 x 295 x 29	290 x 395 x 31	3.70
HLMD(SE)/600	600	305 x 400 x 1.5	205 x 300 x 29	305 x 400 x 31	4.40

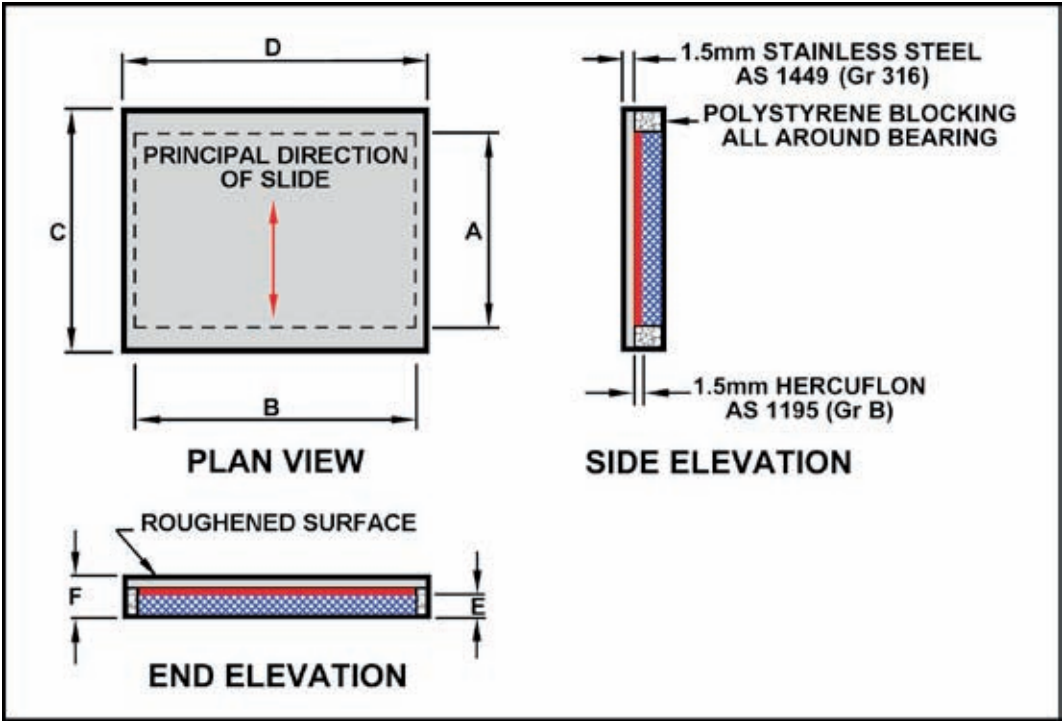


Fig 2-6 Dimension Reference Points

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SECTION 3 - HERCULON TYPE D BEARINGS

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Application

Herculon Type D Free Float Bearings (HLD/FF) have been developed to fulfil the need for a low friction bearing on corbels and columns where a continuous slipjoint is inappropriate. They can be used under beams and slabs and also under pipes, ducts, conveyors, pressure vessels and small span bridges.

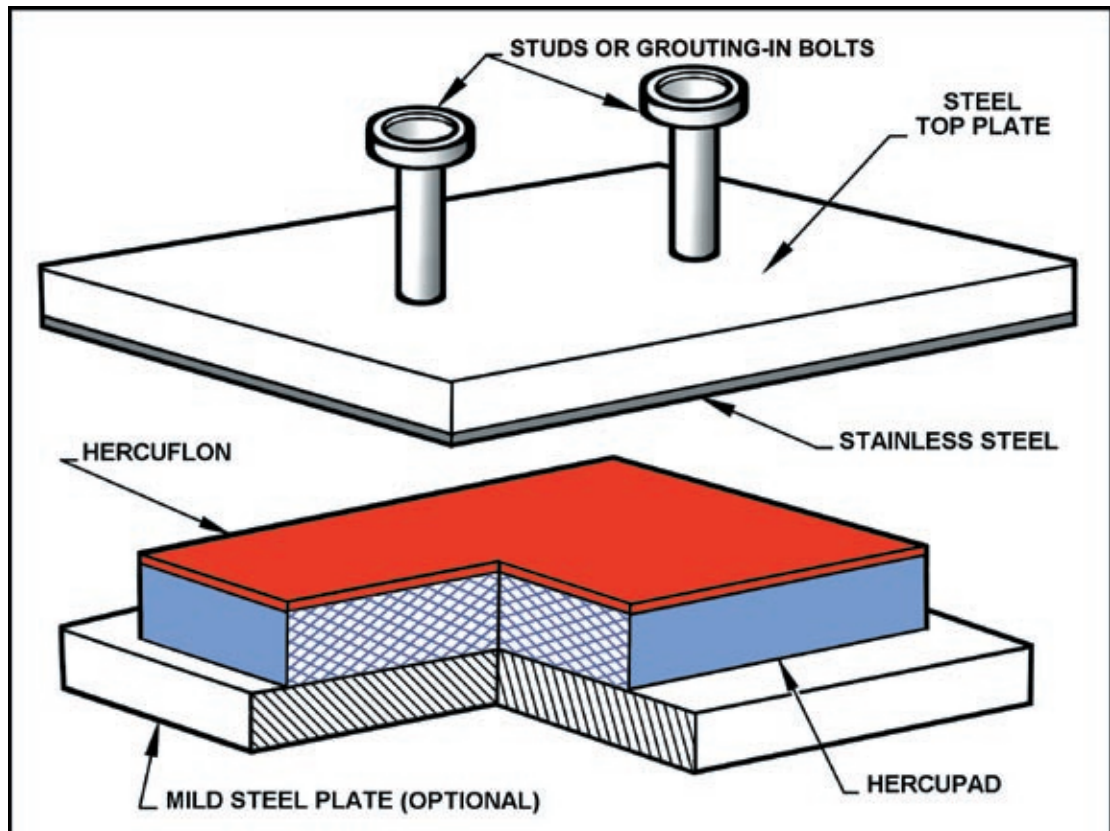


Fig 3-1 Herculon Type D Free Float Bearing

Materials

HLD/FF consist of a mild steel top plate to which is attached a polished stainless steel facing plate. This plate slides against a *Hercuflon* coated *Hercupad* which in turn is bonded to a mild steel base plate (optional).

Design

The following design limitations are recommended:

- Coefficient of friction 0.05 - 0.08 depending on stress.
- Expansion capacity up to ± 30 mm.
- Maximum contact stress 10 MPa.
- Maximum rotation up to 0.02 radians.
- Maximum temperature 80°C.

Standard top slide plates have been designed to accommodate up to ± 30 mm design expansion in the principle direction of movement and ± 7.5 mm in transverse direction. If extra expansion or rotation capacity is required please contact our Technical Department.

Table 3-1 Part Numbers for Herculon Type D Free Float Bearings

Part Number	Maximum Vertical Working Load kN	Top Plate Dimensions (mm) C x D x H for the Following Expansions: (mm)			Pad Dimensions (mm) G x F x E for the Following Rotations: (rads)			Base Plate Dimensions A x B x J (mm)
		A (±10)	B (±20)	C (±30)	D (0.010)	E (0.015)	F (0.02)	
HLD/FF 75	75	95 x 125 x 16	115 x 125 x 16	135 x 125 x 16	70 x 110 x 10	70 x 110 x 17	70 x 110 x 17	85 x 125 x 16
HLD/FF 100	100	100 x 150 x 16	120 x 150 x 16	140 x 150 x 16	75 x 135 x 10	75 x 135 x 17	75 x 135 x 17	90 x 150 x 16
HLD/FF 125	125	110 x 165 x 16	130 x 165 x 16	150 x 165 x 16	85 x 150 x 10	85 x 150 x 17	85 x 150 x 17	100 x 165 x 16
HLD/FF 150	150	125 x 165 x 16	145 x 165 x 16	165 x 165 x 16	100 x 150 x 10	100 x 150 x 17	100 x 150 x 23	115 x 165 x 16
HLD/FF 175	175	135 x 175 x 16	155 x 175 x 16	175 x 175 x 16	110 x 160 x 10	110 x 160 x 17	110 x 160 x 23	125 x 175 x 16
HLD/FF 200	200	150 x 175 x 16	170 x 175 x 16	190 x 175 x 16	125 x 160 x 10	125 x 160 x 17	125 x 160 x 23	140 x 175 x 16
HLD/FF 225	225	150 x 195 x 16	170 x 195 x 16	190 x 195 x 16	125 x 180 x 10	125 x 180 x 17	125 x 180 x 23	140 x 195 x 16
HLD/FF 250	250	160 x 205 x 16	180 x 205 x 16	200 x 205 x 16	135 x 190 x 10	135 x 190 x 17	135 x 190 x 23	150 x 205 x 16
HLD/FF 275	275	165 x 215 x 16	185 x 215 x 16	205 x 215 x 16	140 x 200 x 10	140 x 200 x 17	140 x 200 x 23	155 x 215 x 16
HLD/FF 300	300	165 x 230 x 16	185 x 230 x 16	205 x 230 x 16	140 x 215 x 10	140 x 215 x 23	140 x 215 x 23	155 x 230 x 16
HLD/FF 325	325	170 x 240 x 16	190 x 240 x 16	210 x 240 x 16	145 x 225 x 10	145 x 225 x 23	145 x 225 x 29	160 x 240 x 16
HLD/FF 350	350	175 x 250 x 16	195 x 250 x 16	215 x 250 x 16	150 x 235 x 10	150 x 235 x 23	150 x 235 x 29	165 x 250 x 16
HLD/FF 375	375	185 x 255 x 16	205 x 255 x 16	225 x 255 x 16	160 x 240 x 10	160 x 240 x 23	160 x 240 x 29	175 x 255 x 16
HLD/FF 400	400	185 x 265 x 16	205 x 265 x 16	225 x 265 x 16	160 x 250 x 10	160 x 250 x 23	160 x 250 x 29	175 x 265 x 16
HLD/FF 425	425	190 x 275 x 16	210 x 275 x 16	230 x 275 x 16	165 x 260 x 17	165 x 260 x 23	165 x 260 x 29	180 x 275 x 16
HLD/FF 450	450	195 x 285 x 16	215 x 285 x 16	235 x 285 x 16	170 x 270 x 17	170 x 270 x 23	170 x 270 x 29	185 x 285 x 16
HLD/FF 475	475	200 x 295 x 16	220 x 295 x 16	240 x 295 x 16	175 x 280 x 17	175 x 280 x 29	175 x 280 x 29	190 x 295 x 16
HLD/FF 500	500	200 x 305 x 16	220 x 305 x 16	240 x 305 x 16	175 x 290 x 17	175 x 290 x 29	175 x 290 x 29	190 x 305 x 16

Part Number	Maximum Vertical Working Load kN	Top Plate Dimensions (mm) C x D x H for the Following Expansions: (mm)			Pad Dimensions (mm) G x F x E for the Following Rotations: (rads)				Base Plate Dimensions A x B x J (mm)
		A (±10)	B (±20)	C (±30)	D (0.010)	E (0.015)	F (0.02)	G	
HLD/FF 525	525	205 x 310 x 16	225 x 310 x 16	245 x 310 x 16	180 x 295 x 17	180 x 295 x 29	180 x 295 x 29	195 x 310 x 16	
HLD/FF 550	550	215 x 310 x 16	235 x 310 x 16	255 x 310 x 16	190 x 295 x 17	190 x 295 x 29	190 x 295 x 29	205 x 310 x 16	
HLD/FF 575	575	220 x 315 x 16	240 x 315 x 16	260 x 315 x 16	195 x 300 x 17	195 x 300 x 29	195 x 300 x 29	210 x 315 x 16	
HLD/FF 600	600	230 x 315 x 16	250 x 315 x 16	270 x 315 x 16	205 x 300 x 17	205 x 300 x 29	205 x 300 x 29	220 x 315 x 16	

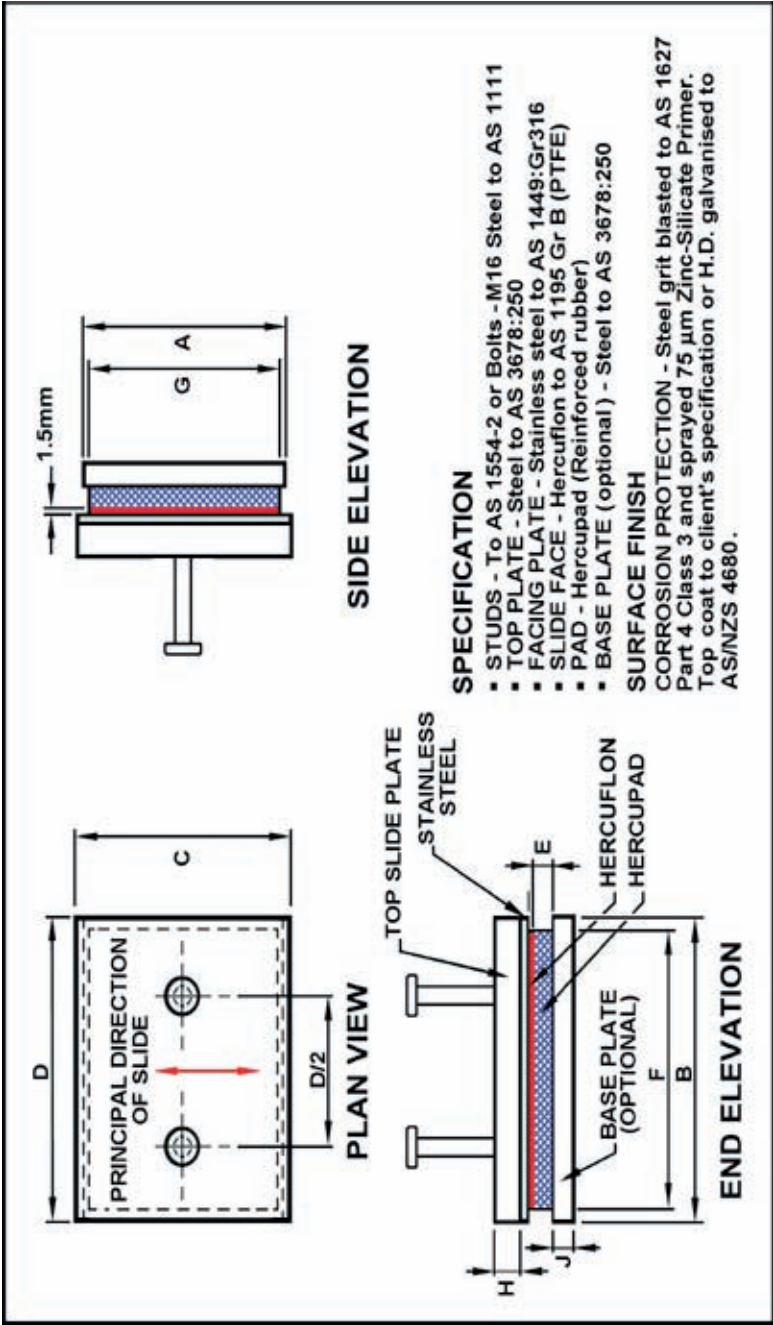


Fig 3-2 Dimension Reference Points

Installation**In Concrete Structures**

Fig 3-3 shows a *HLD/FF* bearing being cast into an in-situ roof slab. Before leaving our factory the bearing pad is blocked with polystyrene strips and the whole bearing assembly is sealed with paper tape. This tape excludes dirt and dust from the *Hercuflon* face and should not be removed. Welded shear connectors are normally supplied with the top plate. In some cases grouting-in bolts may be provided to screw into the tapped holes provided in the top plate.

The *HLD/FF* bearing should be installed in a concrete structure as shown in Fig 3-3 and in accordance with the following instructions:

1. Prepare concrete seatings with a nominal 10 mm thick mortar pad with a wood float finish so that the level does not vary more than 2 mm from a straight edge placed in any direction across the seating. The horizontal plane of the seating should vary no more than 3 mm from the elevations shown on the plans.
2. Place the bearing in the position shown on the plans and cut any strips of expanded polystyrene required for blocking out around the bearing.
3. Remove the bearing and the loose polystyrene strips and brush off any dust or grit.
4. Apply *Hercules Adhesive* and bond into position. In some case it may be better to use Grout, especially if the seatings are rough.
5. Cover the joins between the bearing and polystyrene strips with polythene sheet or masking tape to prevent the ingress of concrete during the pour.
6. Pour concrete directly onto the top surface of the mild steel top plate.

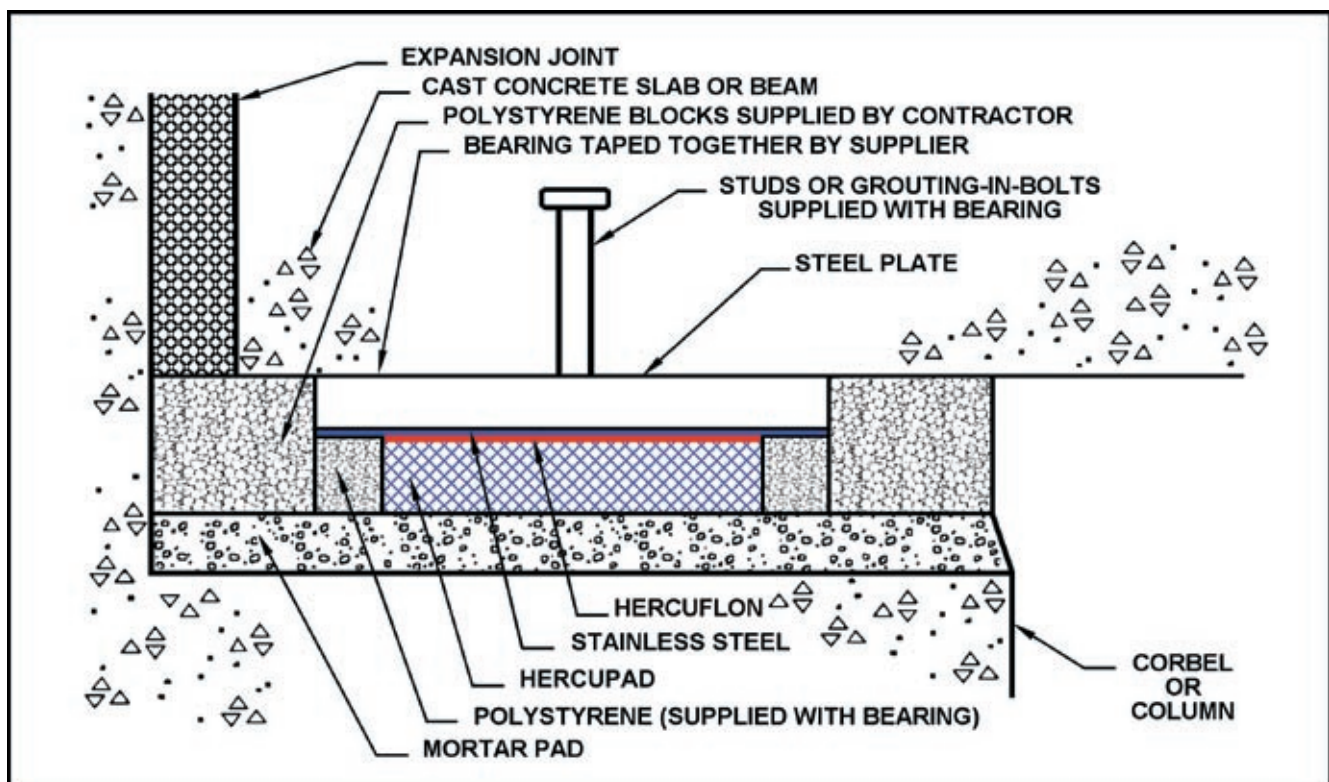


Fig 3-3 Installation of HLD/FF Bearing in a Concrete Structure

Installation**In Steel Structures**

Fig 3-4 shows a HLD/FF bearing installed in a steel structure. With this type of installation, bolts are provided to screw into the tapped holes in the top and base plates.

Bolted or dowelled connections are preferable to welded ones because of the possible damage to the epoxy bonds used on *Herculon* bearings. If welded connections are unavoidable then the top plate and base plate should be thicker than normal and tack welding only should be employed. Fabricated steel structures are likely to be distorted and should be checked for flatness at the bearing seats. A straight edge placed from corner to corner across the seating should show no more than 0.25 mm gap along its length. If this is exceeded the seats may require machining or the bearings chocking up. Alternatively, the gap can be filled with high strength grout.

The *HLD/FF* bearing should be installed in a steel structure as shown in Fig 3-4 and in accordance with the following instructions:

1. Ensure that the top plate is positioned so that it covers the *Hercuflon* pad at all conditions of expansion.

NOTE

The top plate should not be allowed to uncover the *Hercuflon* in service as this will cause major damage.

2. Base plates should be placed so that the *Hercuflon* and stainless steel faces come together as evenly as possible. Pad thickness is normally chosen to accommodate a certain amount of rotation due to the fabrication and constructional tolerances, but excessive misalignments should be investigated at an early stage in erection.
3. Bearings are usually supplied with the top plate and lower pad assembly taped together to protect the *Hercuflon* in transit. It may be necessary to remove this tape during installation, in which case ensure that the *Hercuflon* and stainless steel surfaces are kept scrupulously clean.
4. Some bearing assemblies are supplied with steel straps holding the top and base plates together. This is done to protect the bearing surfaces during transit and erection and/or to provide a particular preset between the two plates. Ensure that the preset bearings are installed as shown on the plans and remember to remove the straps after installation.

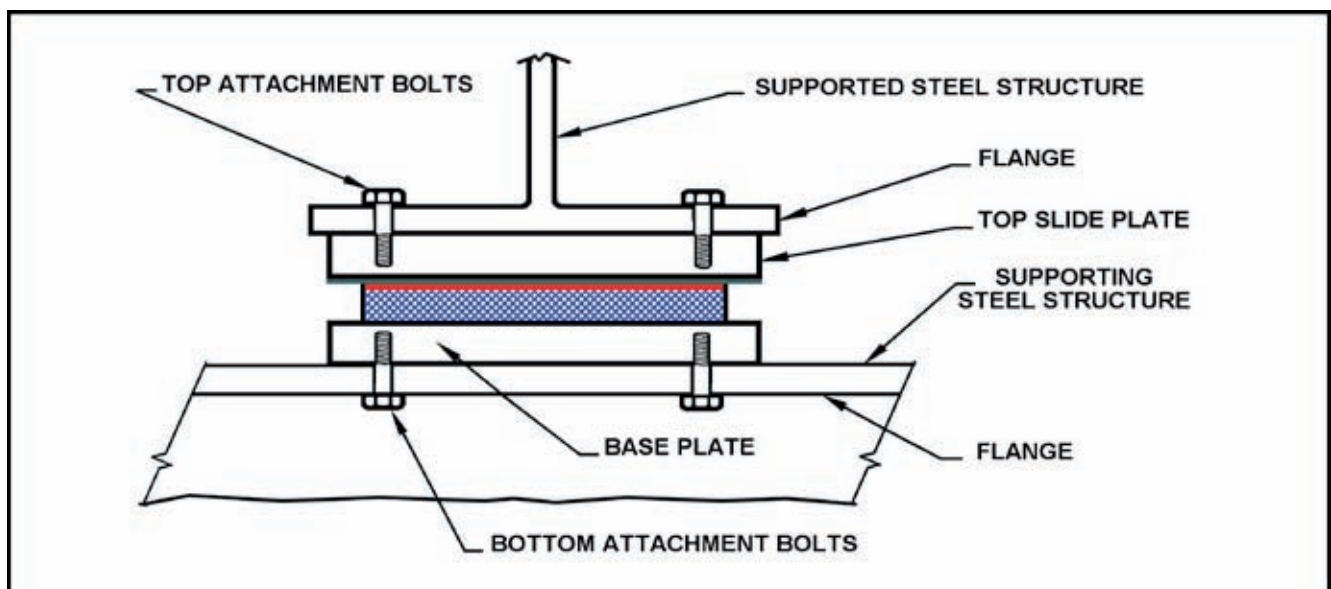


Fig 3-4 Installation of HLD/FF Bearing in a Steel Structure

Ordering

The part number is made up of groups of letters and numbers - HLD/FF/175/A/E/G . This part number equates to:

HLD - *Herculon Type D*

FF - Free Float

175 - Capacity in kN

A - Expansion capacity

E - Rotational capacity

G - Base plate (optional)

Application

Herculon Type D Sliding Guided (HLD/SG) Bearings (see Fig 3-5) have been developed to fulfil the need for a low friction bearing on corbels and columns where a continuous slipjoint is inappropriate. They can be used under beams and slabs and also under pipes, ducts, conveyors, pressure vessels and small span bridges. These bearings are designed to be removable and to accept a lateral load of 30% of the vertical rated load.

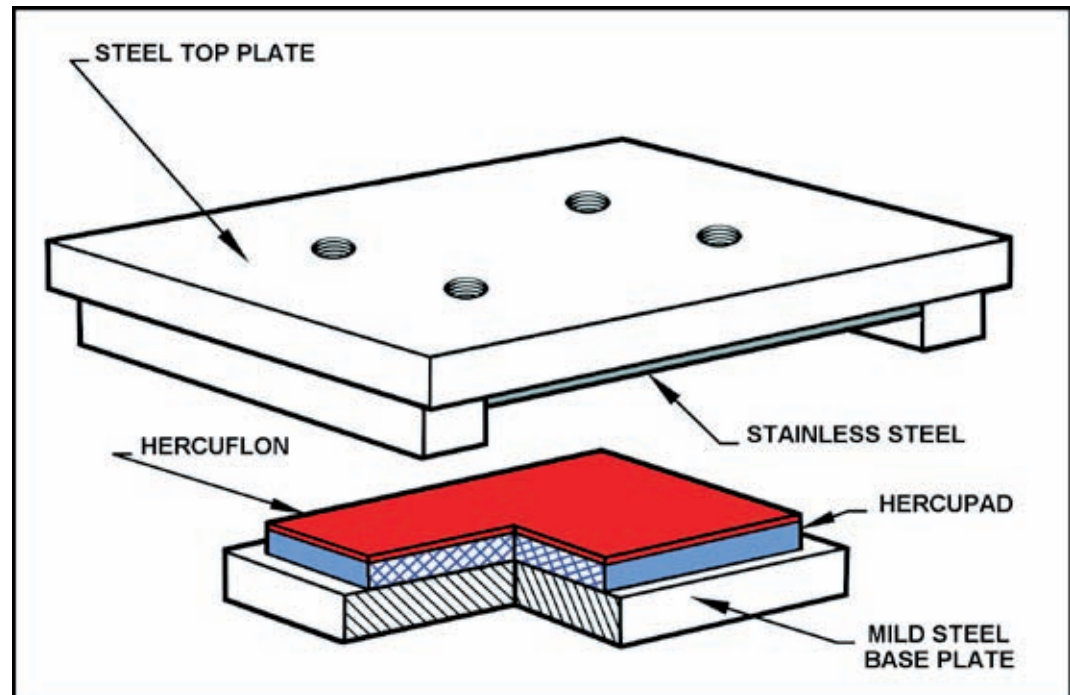


Fig 3-5 Herculon Type D Sliding Guided Bearing

Materials

HLD/SG bearing consists of a mild steel top plate to which is welded a polished stainless steel facing plate. This plate slides against a *Hercuflon* coated *Hercupad*. This in turn is bonded to a mild steel base plate.

Design

The following design limitations are recommended:

- Coefficient of friction 0.05 - 0.08 depending on stress.
- Expansion capacity up to ± 40 mm.
- Maximum contact stress 10 MPa.
- Maximum rotation up to 0.02 radians.
- Maximum temperature 80°C.

NOTE

Higher temperatures can be accommodated by thermally insulating the bearings or by using high temperature materials. Please contact our Technical Department for further information.

Installation**In Concrete Structures**

Fig 3-6 shows a *HLD/SG* bearing being cast into an in-situ roof slab. Grouting-in bolts are provided to screw into the tapped holes in the top and base plates.

The *HLD/SG* bearing should be installed in a concrete structure as shown in Fig 3-6 and in accordance with the following instructions:

1. Prepare concrete seatings with a nominal 10 mm thick mortar pad with a wood float finish so that the level does not vary more than 2 mm from a straight edge placed in any direction across the seating. The horizontal plane of the seating should vary no more than 3 mm from the elevations shown on the plans.
2. Place the bearing in the position shown on the plans and fit formwork around the bearing.
3. Cover the joints between the bearing and formwork with polythene sheet or masking tape to prevent the ingress of concrete during the pour.
4. Pour concrete directly onto the top surface of the mild steel top attachment plate.

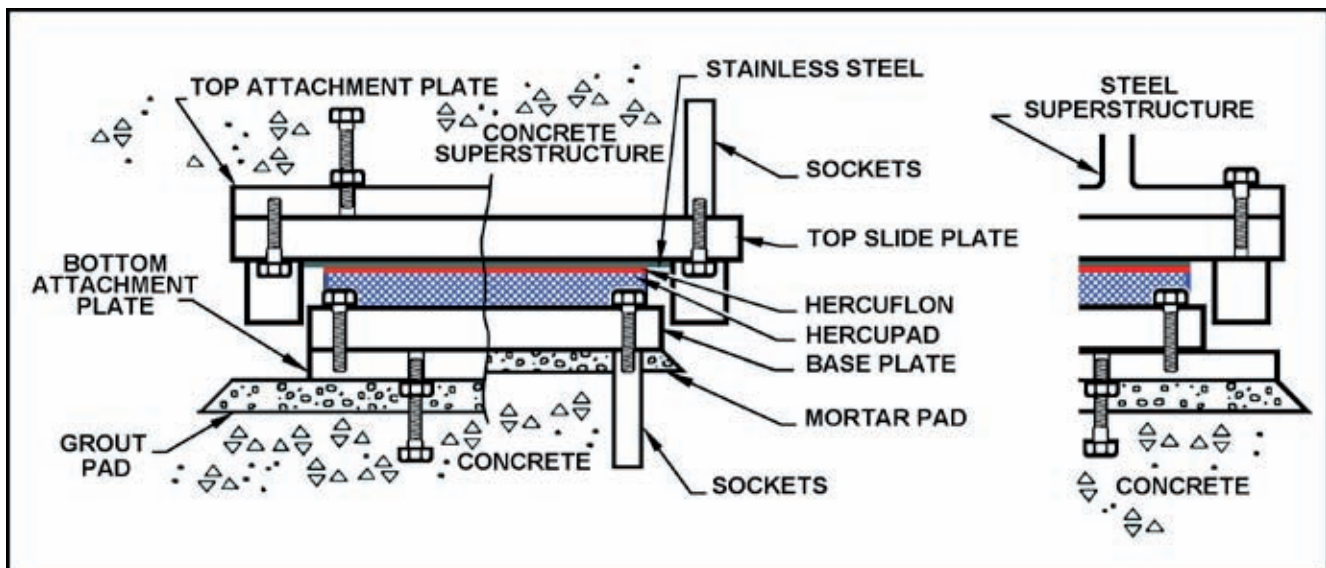


Fig 3-6 Installation of HLD/SG Bearing in a Concrete Structure

Installation**In Steel Structures**

Figure 3-7 shows a *HLD/SG* bearing installed in a steel structure. In this type of installation, bolts are provided to screw into the tapped holes in the top and base plates.

Bolted or dowelled connections are preferable to welded ones because of the possible damage to the epoxy bonds used on *Herculon* bearings. If welded connections are unavoidable then the top plate and base plate should be thicker than normal and tack welding only should be employed. Fabricated steel structures are likely to be distorted and should be checked for flatness at the bearing seats. A straight edge placed from corner to corner across the seating should show more than 0.25 mm gap along its length. If this is exceeded the seats may require machining or the bearings chocking up. Alternatively, the gap can be filled with high strength grout.

The *HLD/SG* bearing should be installed in a steel structure as shown in Fig 3-7 and in accordance with the following instructions:

1. Ensure that the top plate is positioned so that it covers the *Hercuflon* pad at all conditions of expansion.

! NOTE

The top plate should not be allowed to uncover the *Hercuflon* in service as this will cause major damage.

2. Base plates should be placed so that the *Hercuflon* and stainless steel faces come together as evenly as possible. Pad thickness is normally chosen to accommodate a certain amount of rotation due to the fabrication and constructional tolerances, but excessive misalignments should be investigated at an early stage in erection.
3. Bearings are usually supplied with the top plate and lower pad assembly taped together to protect the *Hercuflon* in transit. It may be necessary to remove this tape during installation, in which case ensure that the *Hercuflon* and stainless steel surfaces are kept scrupulously clean.
4. Some bearing assemblies are supplied with steel straps holding the top and base plates together. This is done to protect the bearing surfaces during transit and erection and/or to provide a particular preset between the two plates. Ensure that the preset bearings are installed as shown on the plans and remember to remove the straps after installation.

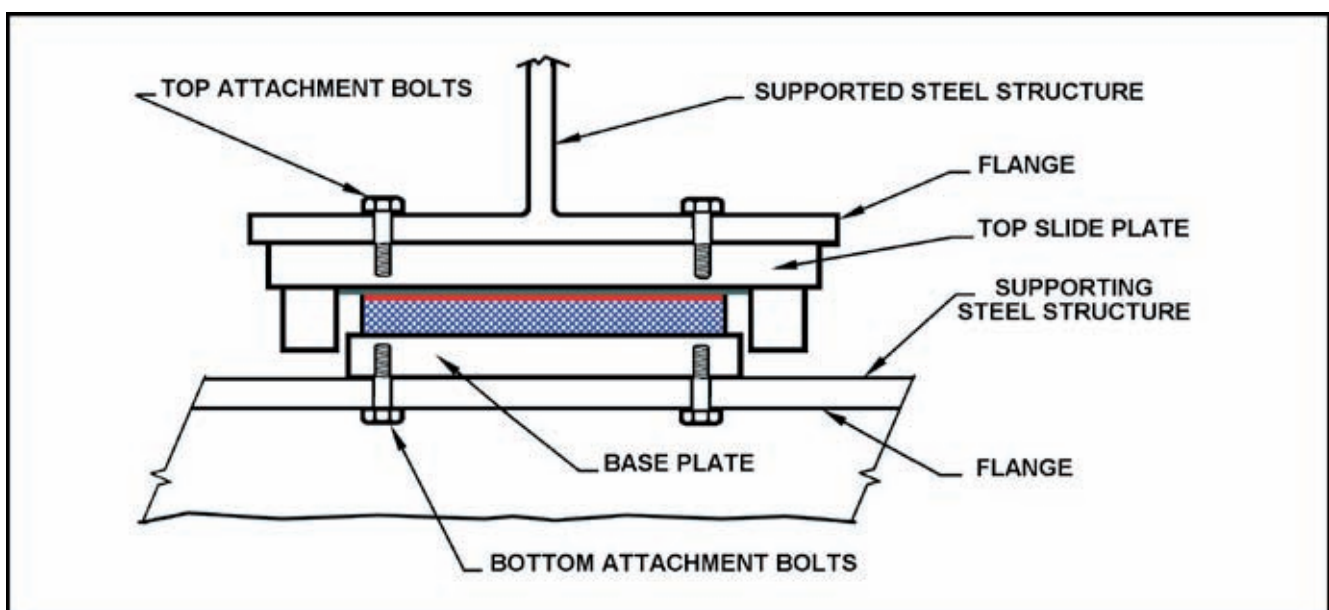


Fig 3-7 Installation of a HLD/SG Bearing in a Steel Structure

Ordering

The bearing part number is made up of groups of letters and numbers HLD/SG 175. This part number equates to:

HLD - *Herculon Type D*

SG - *Sliding Guided*

175 - Capacity in kN

Table 3-2 HLD/SG Attachment Bolts (Steel Connections)

Bearing Part Number	Top and Bottom Bolts		
	Size (Gr 8.8)	Centres	
		Top CC x DD	Bottom AA x BB
HLD/SG 100	M16	40 x 100	40 x 100
HLD/SG 200	M16	90 x 125	90 x 125
HLD/SG 300	M16	105 x 180	105 x 180
HLD/SG 400	M20	115 x 205	115 x 205
HLD/SG 500	M20	130 x 245	130 x 245
HLD/SG 600	M20	160 x 255	160 x 255
 NOTE Refer to Fig 3-8 for dimension reference points			

Table 3-3 Part Numbers for Herculon Type D Sliding Guided Bearing (Steel Connections)

Part Number	Working Load (kN)		Top Plate (±40 mm Expansion) C x D (mm)	Pad Dimensions 0.02 rads E x F (mm)	Base Plate Dimensions A x B (mm)	Bearing Overall Dimensions C x D x H (mm)
	Vmax	Hmax				
HLD/SG 100	100	30	160 x 225	75 x 135 x 17	90 x 150	160 x 225 x 59
HLD/SG 200	200	60	210 x 265	125 x 160 x 17	140 x 175	210 x 265 x 59
HLD/SG 300	300	90	240 x 320	140 x 215 x 23	155 x 230	240 x 320 x 65
HLD/SG 400	400	120	245 x 370	160 x 250 x 23	175 x 265	245 x 370 x 75
HLD/SG 500	500	150	260 x 410	175 x 290 x 29	190 x 305	260 x 410 x 81
HLD/SG 600	600	180	290 x 420	205 x 300 x 29	220 x 315	290 x 420 x 81

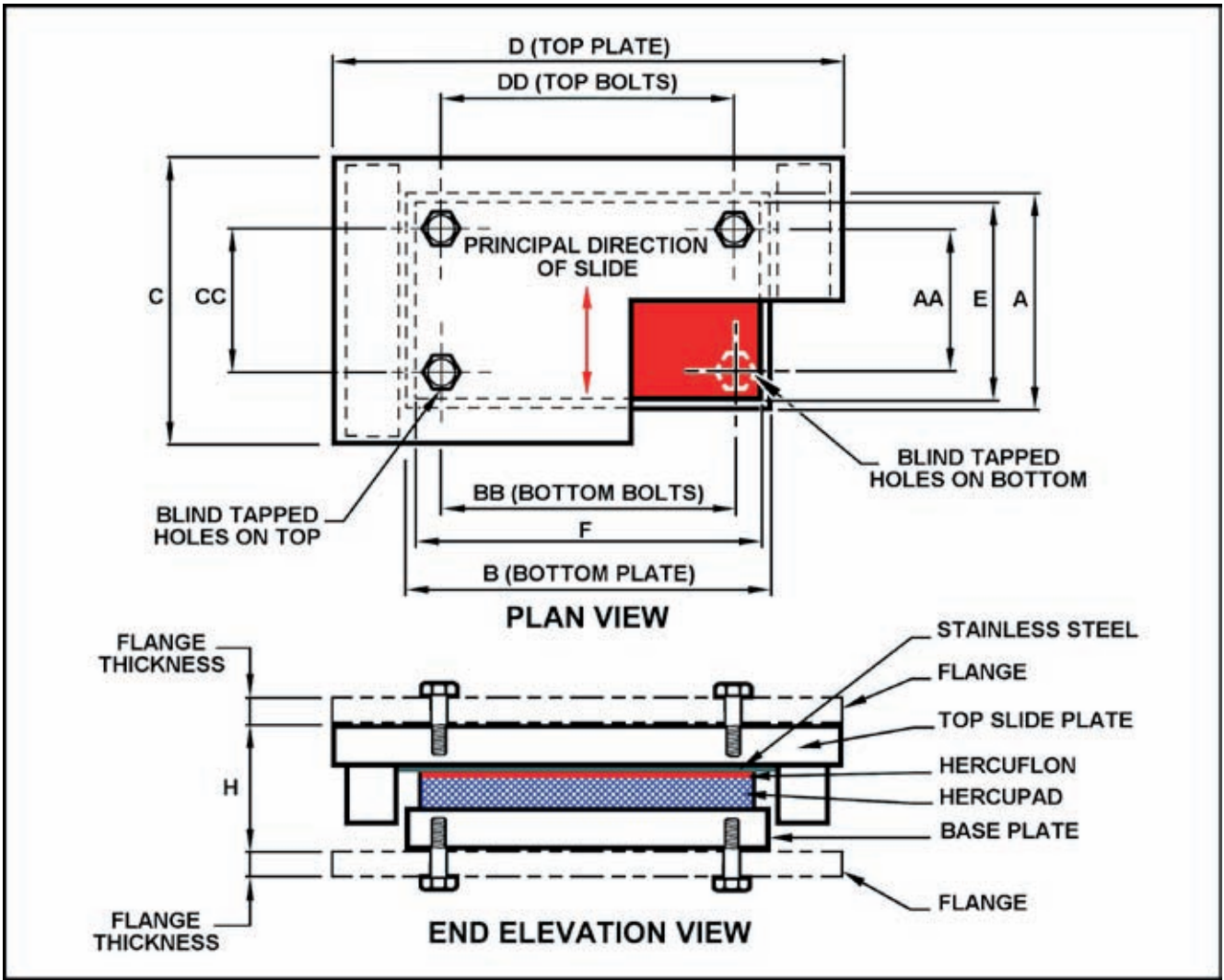


Fig 3-8 Dimension Reference Points (Steel Connections)

Table 3-4 Part Numbers for Herculon Type D Sliding Guided Bearing (for Concrete Structures)

Part Number	Working Load Capacity		Top Attachment Plate PC x PD x t2 (mm)	Top Plate (±40 mm Expansion) PC x PD (mm)	Pad Dimensions 0.02 rads E x F (mm)	Base Plate Dimensions PA x PB (mm)	Cast-in Plate Dimensions PA x PB x t1 (mm)	Bearing Overall Dimensions PA x PD x H + t1 + t2 (mm)
	Vmax (kN)	Hmax (kN)						
HLD/SG 100 (C)	100	30	175 x 240 x 20	175 x 240	75 x 135 x 17	185 x 150	185 x 150 x 20	185 x 240 x 99
HLD/SG 200 (C)	200	60	215 x 265 x 20	215 x 265	125 x 160 x 17	230 x 175	230 x 175 x 20	230 x 265 x 99
HLD/SG 300 (C)	300	90	230 x 320 x 20	230 x 320	140 x 215 x 23	245 x 230	245 x 230 x 20	245 x 320 x 105
HLD/SG 400 (C)	400	120	265 x 370 x 25	265 x 370	160 x 250 x 23	280 x 265	280 x 265 x 25	280 x 370 x 125
HLD/SG 500 (C)	500	150	280 x 410 x 25	280 x 410	175 x 290 x 29	295 x 305	295 x 305 x 25	295 x 410 x 131
HLD/SG 600 (C)	600	180	330 x 420 x 25	330 x 420	205 x 300 x 29	325 x 315	325 x 315 x 25	325 x 420 x 131

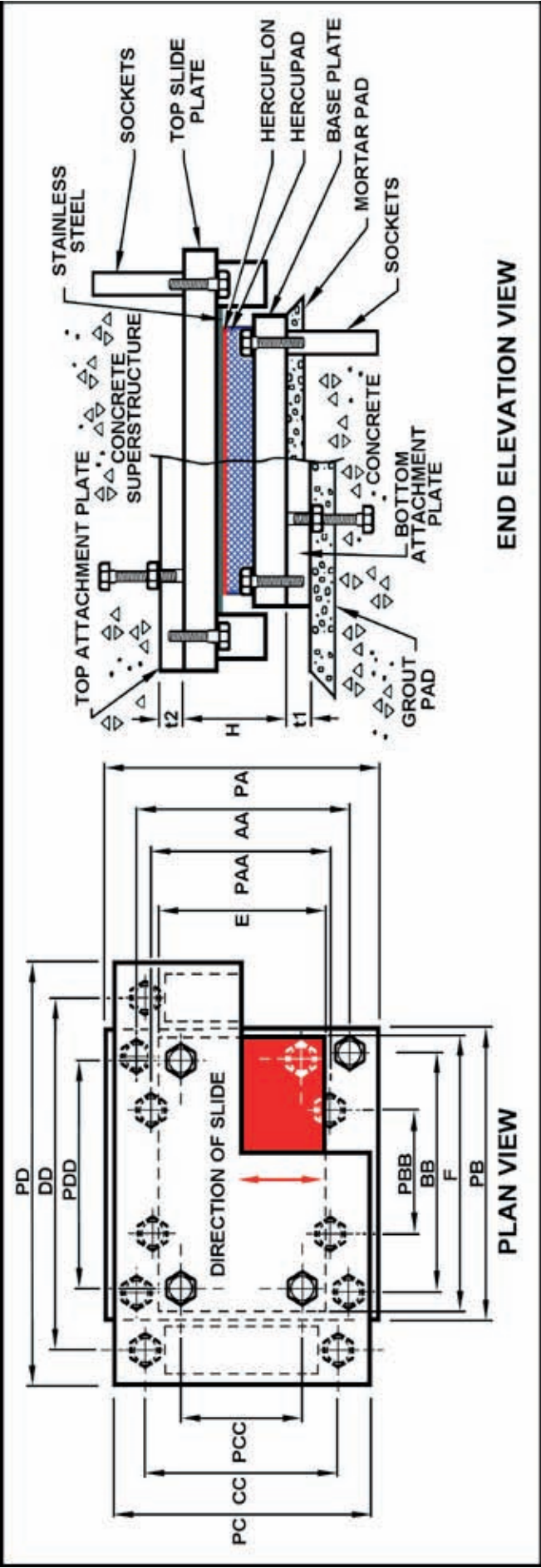


Fig 3-9 Dimension Reference Points (for Concrete Structures)

Attachment Bolts

Table 3-5 lists the various bearing attachment bolt details shown in Fig 3-9 and Fig 3-10 shows an alternate bottom cast-in bolt detail.

Table 3-5 HLD/SG Attachment Bolts (Concrete Structures)

Bearing Part Number	Top & Bottom Attachment Bolts			Top & Bottom Cast-in Bolts		
	Size Grade 8.8	Centres		Size, Grade 8.8 x Length	Centres	
		Top (CC x DD)	Bottom (AA x BB)		Top (PCC x PDD)	Bottom (PAA x PBB)
HLD/SG 100 (C)	M16	125 x 190	135 x 100	M16 x 120	65 x 130	75 x 40
HLD/SG 200 (C)	M16	165 x 215	180 x 125	M16 x 120	105 x 155	120 x 65
HLD/SG 300 (C)	M16	180 x 270	195 x 180	M16 x 120	120 x 210	135 x 120
HLD/SG 400 (C)	M20	205 x 310	220 x 205	M20 x 150	135 x 240	150 x 135
HLD/SG 500 (C)	M20	220 x 350	235 x 245	M20 x 150	150 x 280	165 x 175
HLD/SG 600 (C)	M20	270 x 360	265 x 255	M20 x 150	200 x 290	195 x 185

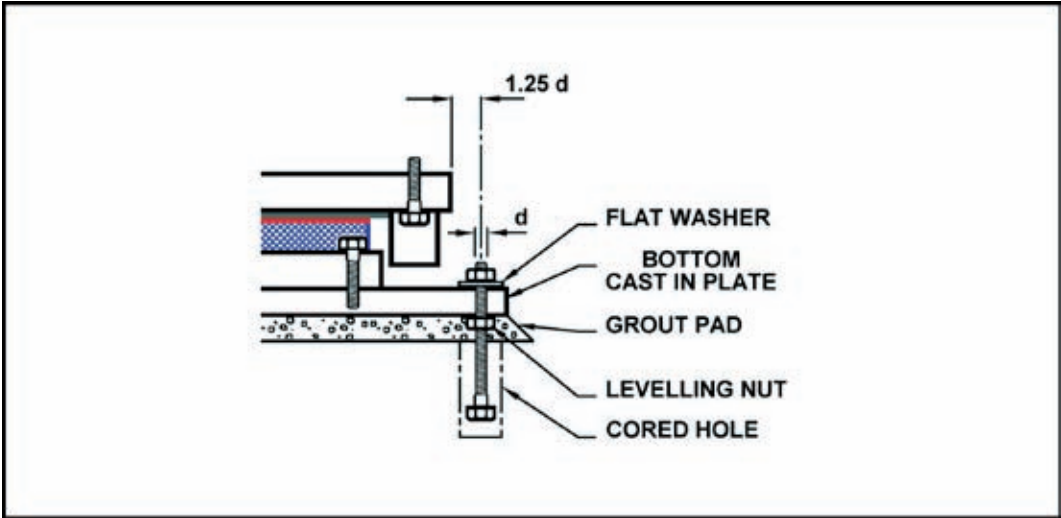


Fig 3-10 Alternate Bottom Cast-in Bolt Detail

Application

Herculon Type D Fixed (HLD/FX) Bearings (see Fig 3-11) have been developed to fulfil the need for a rotation only bearing on corbels and columns. They can be used under beams and slabs and also under pipes, ducts, conveyors, pressure vessels and small span bridges. These bearings are designed to be removable and to accept a lateral load of 30% of the vertical rated load.

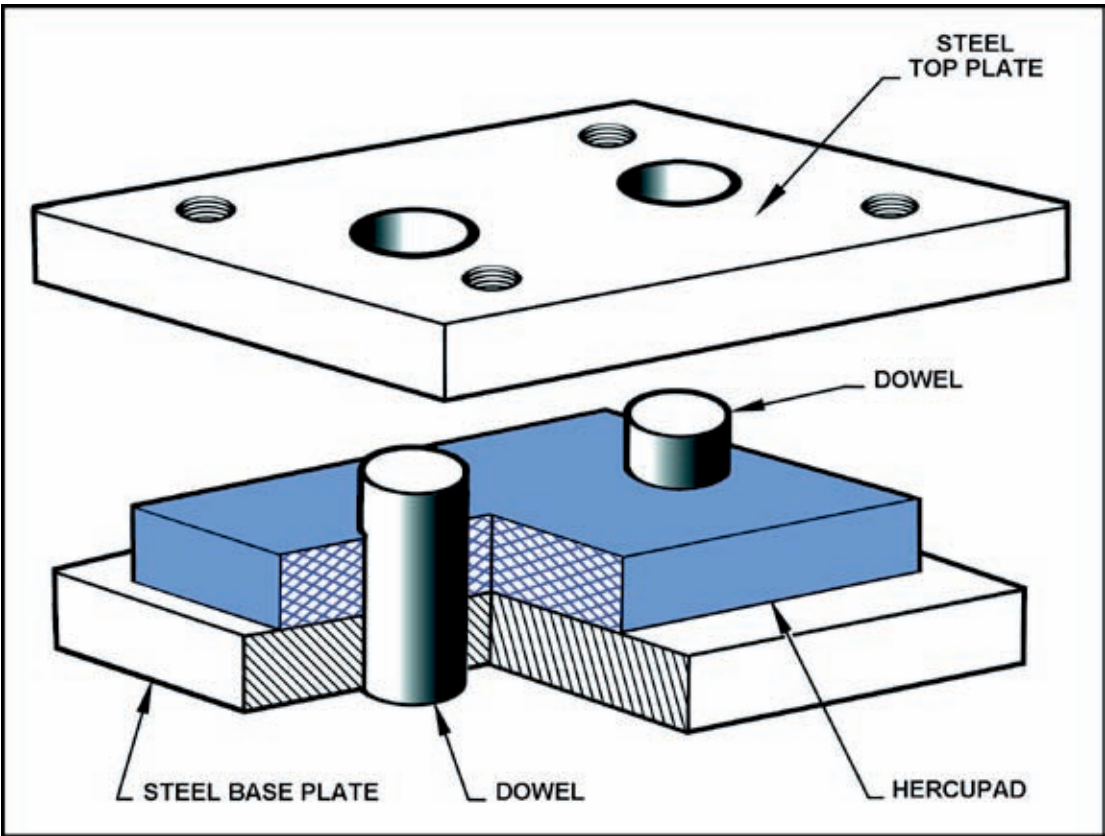


Fig 3-11 Herculon Type D Fixed Bearing

Materials

The *HLD/FX* bearing consists of a mild steel top plate bonded to a fixed *Hercupad*, which in turn is bonded to a mild steel base plate. Two shear pins are provided to transfer the lateral loads.

Design

- The following design limitations are recommended:
- Maximum contact stress 10 MPa.
  - Maximum rotation up to 0.02 radians.
  - Maximum temperature 80°C.

 NOTE

Higher temperatures can be accommodated by thermally insulating the bearings or by using high temperature materials. Please contact our Technical Department for further information.

Installation**In Concrete Structures**

Fig 3-12 shows a *HLD/FX* bearing being cast into an in-situ roof slab. Grouting-in bolts are provided to screw into the tapped holes in the top and base plates.

The *HLD/FX* bearing should be installed in a concrete structure as shown in Fig 3-12 and in accordance with the following instructions:

1. Prepare concrete seatings with a nominal 10 mm thick mortar pad with a wood float finish so that the level does not vary more than 2 mm from a straight edge placed in any direction across the seating. The horizontal plane of the seating should vary no more than 3 mm from the elevations shown on the plans.
2. Place the bearing in the position shown on the plans and fit formwork around the bearing.
3. Cover the joints between the bearing and formwork with polythene sheet or masking tape to prevent the ingress of concrete during the pour.
4. Pour concrete directly onto the top surface of the mild steel top attachment plate.

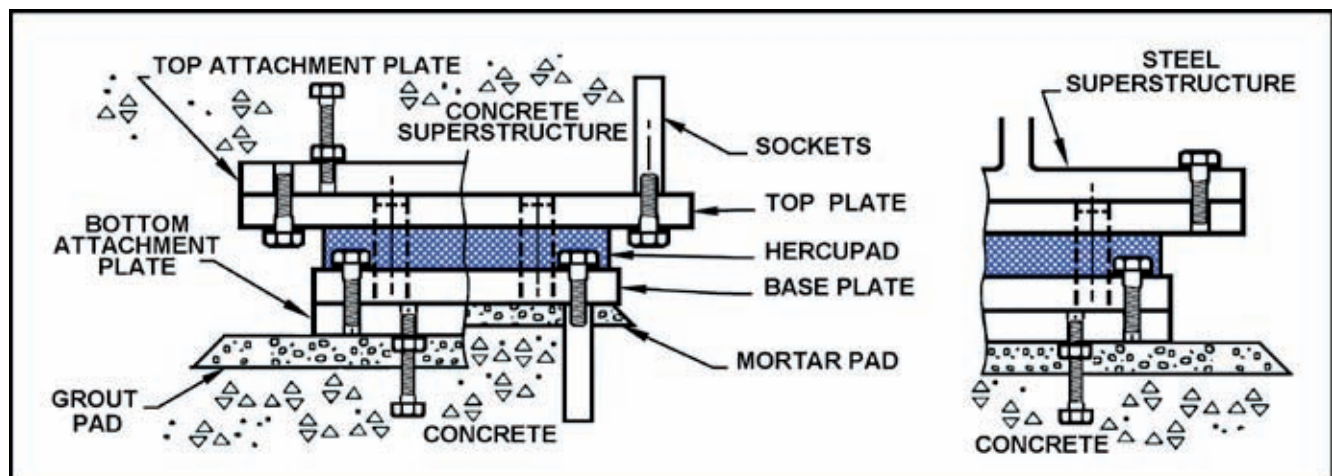


Fig 3-12 Installation of HLD/FX Bearing in a Concrete Structure

Installation

In Steel Structures

Figure 3-13 shows a *HLD/FX* bearing being installed in a steel structure. In this type of installation, bolts are provided to screw into the tapped holes in the top and base plates.

Bolted or dowelled connections are preferable to welded ones because of the possible damage to the epoxy bonds used on *Herculon* bearings. If welded connections are unavoidable then the top plate and base plate should be thicker than normal and tack welding only should be employed. Fabricated steel structures are likely to be distorted and should be checked for flatness at the bearing seats. A straight edge placed from corner to corner across the seating should show more than 0.25 mm gap along its length. If this is exceeded the seats may require machining or the bearings chocking up. Alternatively, the gap can be filled with high strength grout.

The *HLD/FX* bearing should be installed in a steel structure as shown in Fig 3-13.

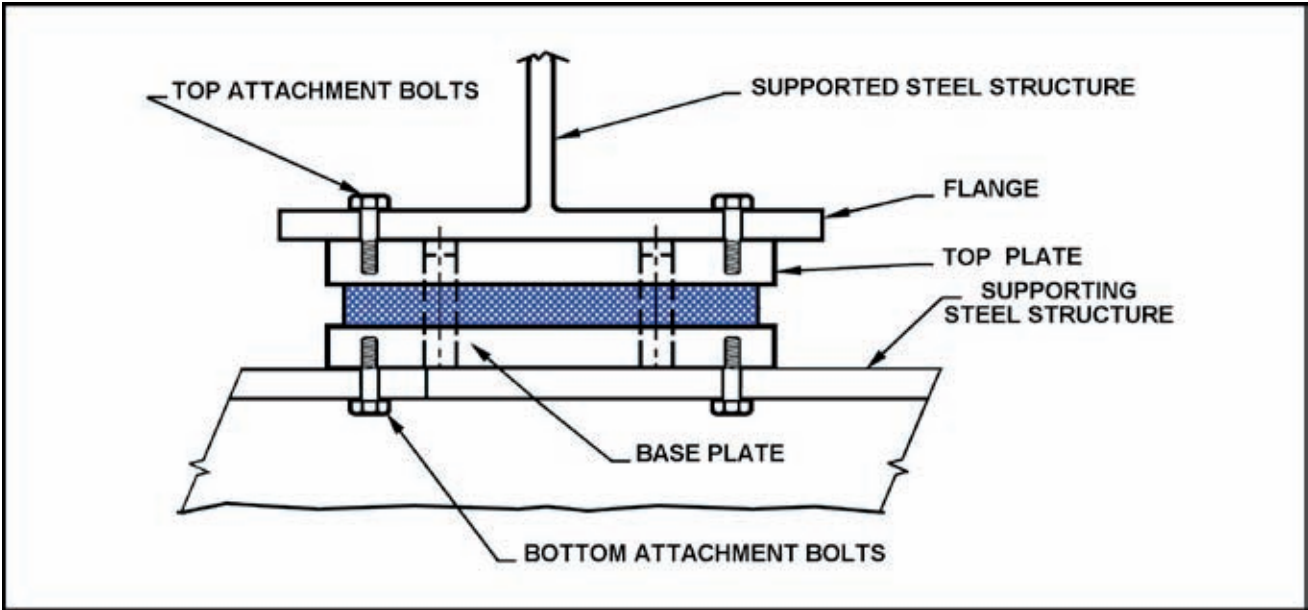


Fig 3-13 Installation of a HLD/FX Bearing in a Steel Structure

Steel Structures

Ordering

Table 3-6 details the range of sizes available for steel connections and Fig 3-14 provides the dimension reference points reflected in Table 3-6.

Table 3-6 Part Numbers for Herculon Type D Fixed Bearing (Steel Structures)

Part Number	Working Load (kN)		Top Plate C x D (mm)	Pad Dimensions 0.02 rads F x G (mm)	Base Plate Dimensions A x B (mm)	Bearing Overall Dimensions C x D x H (mm)
	Vmax	Hmax				
HLD/FX 100	100	30	90 x 150	75 x 135 x 13	90 x 150	90 x 150 x 53
HLD/FX 200	200	60	140 x 175	125 x 160 x 19	140 x 175	140 x 175 x 59
HLD/FX 300	300	90	155 x 230	140 x 215 x 19	155 x 230	155 x 230 x 59
HLD/FX 400	400	120	175 x 265	160 x 250 x 19	175 x 265	175 x 265 x 69
HLD/FX 500	500	150	190 x 305	175 x 290 x 25	190 x 305	190 x 305 x 75
HLD/FX 600	600	180	220 x 315	205 x 300 x 25	220 x 315	220 x 315 x 75

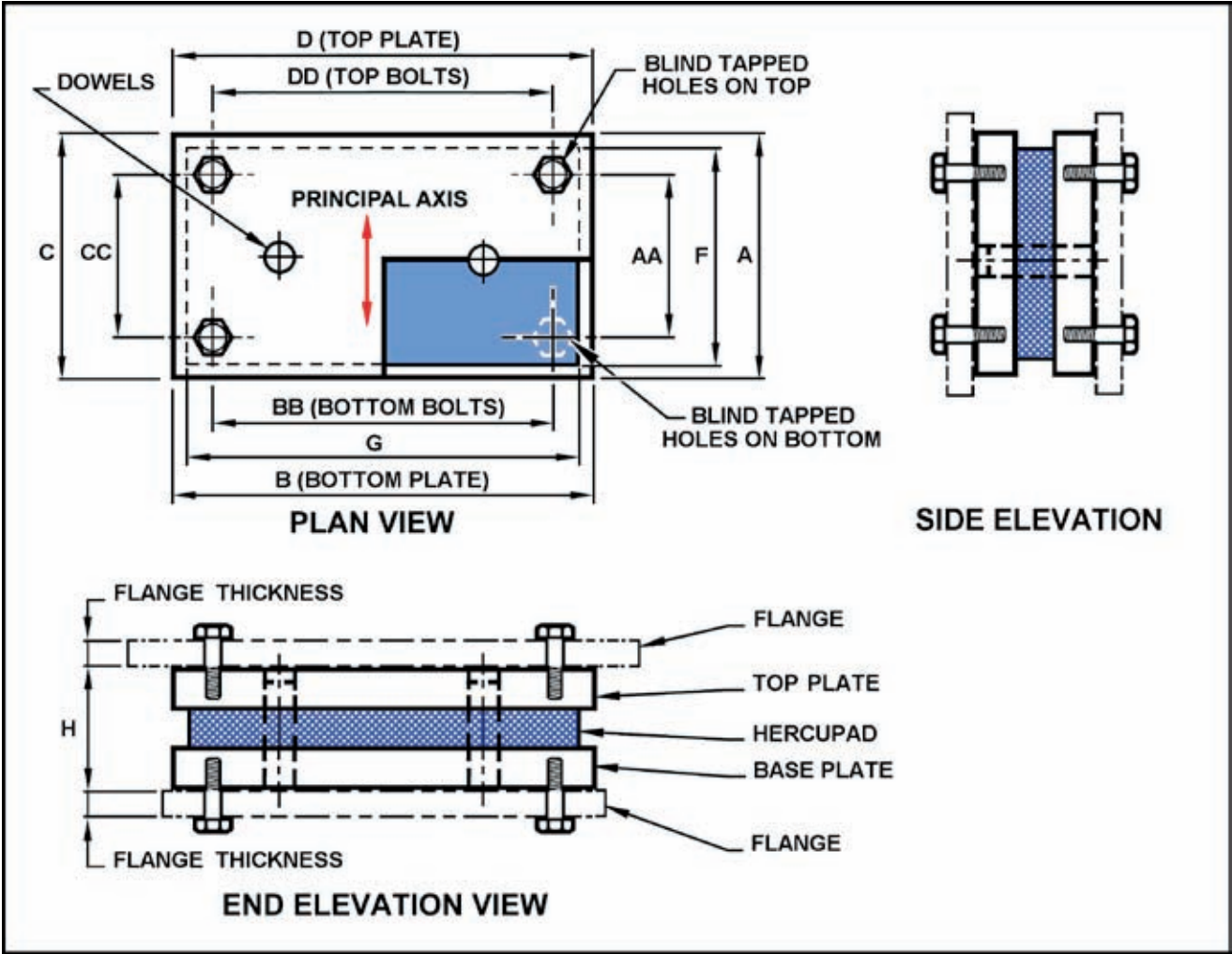


Fig 3-14 Dimension Reference Points (Steel Structures)

Concrete Structures

Table 3-7 details the part numbers of the *HLD/FX* bearings used on concrete structures. Table 3-8 details the attachment bolts that are used on the *HLD/FX* bearings when they are attached to concrete structures.

Table 3-7 Part Numbers for Herculon Type D Fixed Bearing (Concrete Structures)

Part Number	Working Load Capacity		Top Attachment Plate PC x PD x t2 (mm)	Top Plate C x D (mm)	Pad Dimensions 0.02 rads F x G (mm)	Base Plate Dimensions PA x PB (mm)	Cast-in Plate Dimensions PA x PB x t1 (mm)	Bearing Overall Dimensions PA x PD x H+t1+t2 (mm)
	Vmax (kN)	Hmax (kN)						
HLD/FX 100 (C)	100	30	90 x 240 x 20	90 x 240	75 x 135 x 13	185 x 150	185 x 150 x 20	185 x 240 x 93
HLD/FX 200 (C)	200	60	140 x 265 x 20	140 x 265	125 x 160 x 19	230 x 175	230 x 175 x 20	230 x 265 x 99
HLD/FX 300 (C)	300	90	155 x 320 x 20	155 x 320	140 x 215 x 19	245 x 230	245 x 230 x 20	245 x 320 x 99
HLD/FX 400 (C)	400	120	175 x 370 x 25	175 x 370	160 x 250 x 19	280 x 265	280 x 265 x 25	280 x 370 x 119
HLD/FX 500 (C)	500	150	190 x 410 x 25	190 x 410	175 x 290 x 25	295 x 305	295 x 305 x 25	295 x 410 x 125
HLD/FX 600 (C)	600	180	220 x 420 x 25	220 x 420	205 x 300 x 25	325 x 315	325 x 315 x 25	325 x 420 x 125

Table 3-8 Herculon Type D Fixed Bearing Attachment Bolts (Concrete Structures)

Bearing Part Number	Top & Bottom Attachment Bolts			Top & Bottom Cast-in Bolts		
	Size Grade 8.8	Centres		Size Grade 8.8 x Length	Centres	
		Top (CC x DD)	Bottom (AA x BB)		Top (PCC x PDD)	Bottom (PAA x PBB)
HLD/FX 100 (C)	M16	45 x 190	135 x 100	M16 x 120	40 x 60	70 x 40
HLD/FX 200 (C)	M16	90 x 215	180 x 125	M16 x 120	90 x 135	120 x 65
HLD/FX 300 (C)	M16	105 x 270	195 x 180	M16 x 120	105 x 160	135 x 120
HLD/FX 400 (C)	M20	115 x 310	220 x 205	M20 x 150	115 x 175	150 x 135
HLD/FX 500 (C)	M20	130 x 350	235 x 245	M20 x 150	130 x 195	165 x 175
HLD/FX 600 (C)	M20	160 x 360	265 x 255	M20 x 150	160 x 240	195 x 185

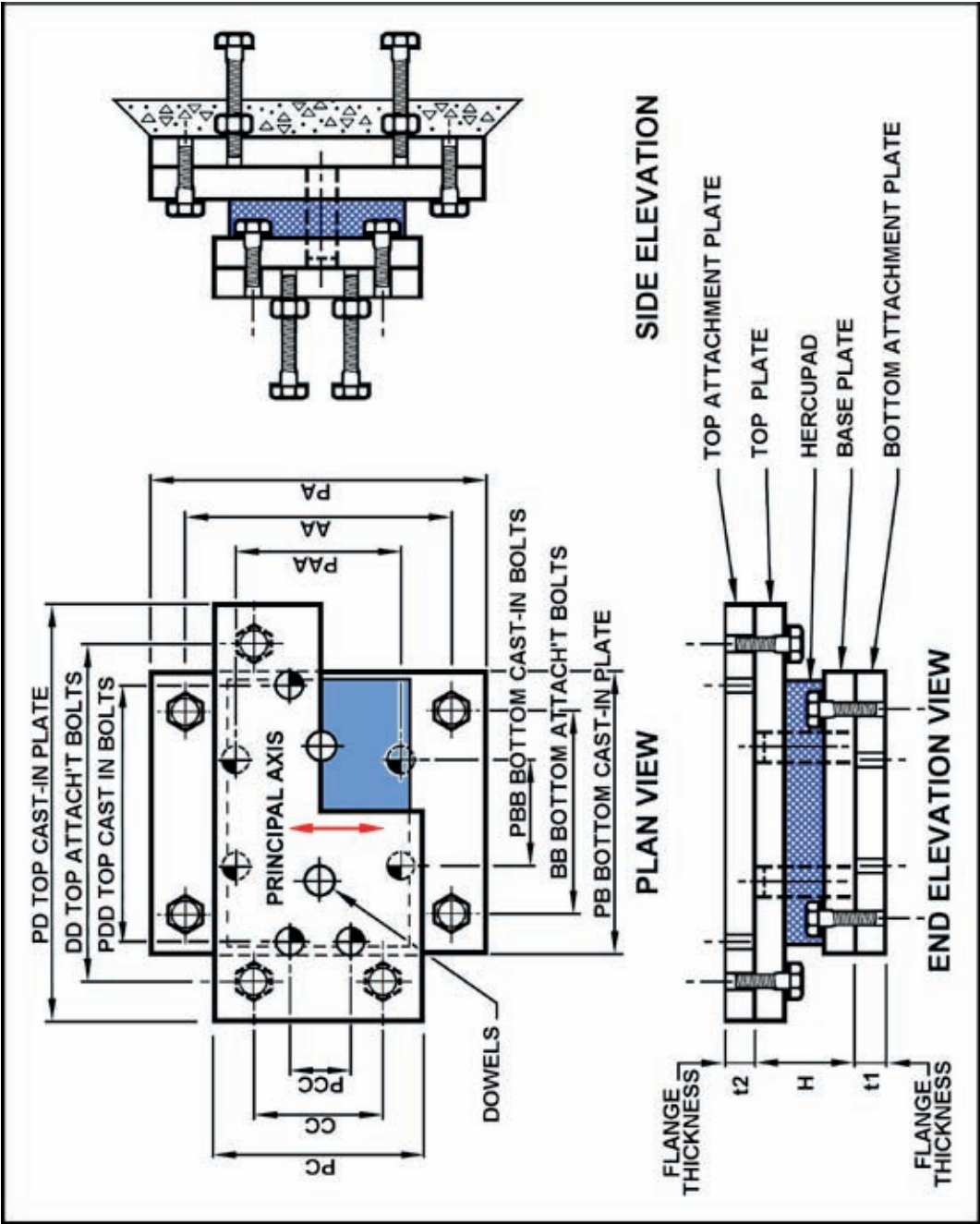


Fig 3-15 Dimension Reference Points (Concrete Structures)

The bearing part number is made up of groups of letters and numbers HLD/FX 100. This part number equates to:

HLD - *Herculon Type D*

FX - *Fixed*

100 - Capacity in kN

Table 3-9 Herculon Type D Fixed Bearing Attachment Bolts (Steel Connections)

Bearing Part Number	Top and Bottom Bolts		
	Size (Gr 8.8)	Centres	
		Top CC x DD	Bottom AA x BB
HLD/FX 100	M16	40 x 100	40 x 100
HLD/FX 200	M16	90 x 125	90 x 125
HLD/FX 300	M16	105 x 180	105 x 180
HLD/FX 400	M20	115 x 205	115 x 205
HLD/FX 500	M20	130 x 245	130 x 245
HLD/FX 600	M20	160 x 255	160 x 255

 **NOTE**

Refer to Fig 3-14 for dimension reference points (AA, BB, CC & DD)

Alternate Bottom Cast-in Bolt Detail

An alternate bottom cast-in bolt detail can be designed with a drilled hole through the bottom cast-in plate as shown in Fig 3-16.

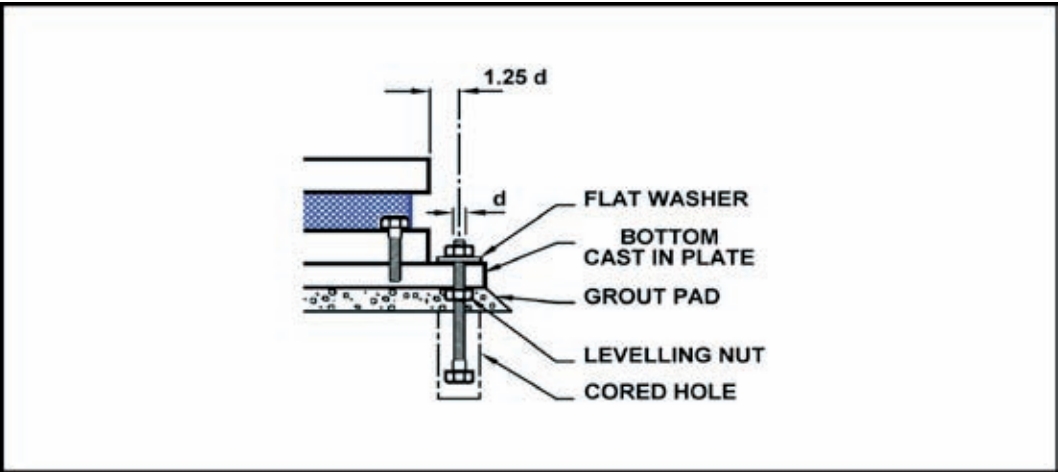


Fig 3-16 Alternate Bottom Cast-in Bolt Detail

Application

Herculon Type D Tank Top (HLD/TT) Bearings (see Fig 3-17) have been developed to fulfil the need for an easily installed low friction bearing under roof beams of water tanks. They are particularly useful where loads are small and both lateral and uplift forces need to be accommodated. They can also be used in other light structures.

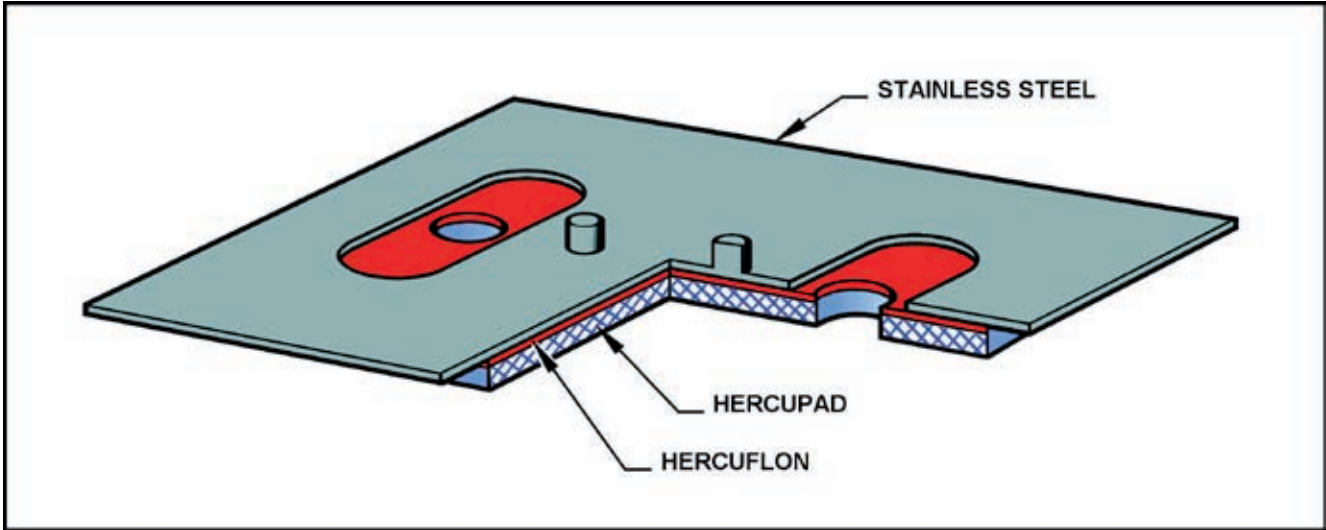


Fig 3-17 Herculon Type D Tank Top Bearing

Materials

The *HLD/TT* bearing consists of a thin stainless steel slide plate with two stainless steel studs flash welded to the upper face. The lower face is highly polished and the plate is provided with two slotted holes for uplift through-bolts. This plate slides against a *Hercuflon* coated *Hercupad* which has two clearance holes drilled in it.

Types

There is only one type of *HLD/TT* bearing available but it is available in five sizes depending upon working load requirements (see Table 3-10). Bearings having larger capacities or of different dimensions than those listed can be designed by our Technical Department.

Design

- The following design limitations are recommended:
- Coefficient of friction 0.05 - 0.08 depending on stress.
  - Expansion capacity up to ± 20 mm.
  - Maximum rotation up to 0.01 radians.
  - Maximum temperature 80°C.

Installation

Fig 3-18 shows a *HLD/TT* bearing installed on a steel or concrete water tank. Before leaving our factory, the two components are taped together to prevent damage to the low friction surfaces during transit. This tape should be removed before installation.

The *HLD/TT* bearing should be installed as shown in Fig 3-18 and in accordance with the following instructions:

- 1. Cast-in bolts or chemset anchors should be installed as required by the engineer.
- 2. Prepare a nominal 10 mm thick mortar pad such that the level does not vary more than 2 mm from a straight edge placed in any direction across the seating.
- 3. The beam flange needs to be provided with slotted holes and two 10 mm diameter through holes to locate the stainless steel studs.
- 4. The cast-in bolts should be provided with a heavy steel washer, nut and locknut. The nuts should be pulled finger tight and then locked with the locknut.

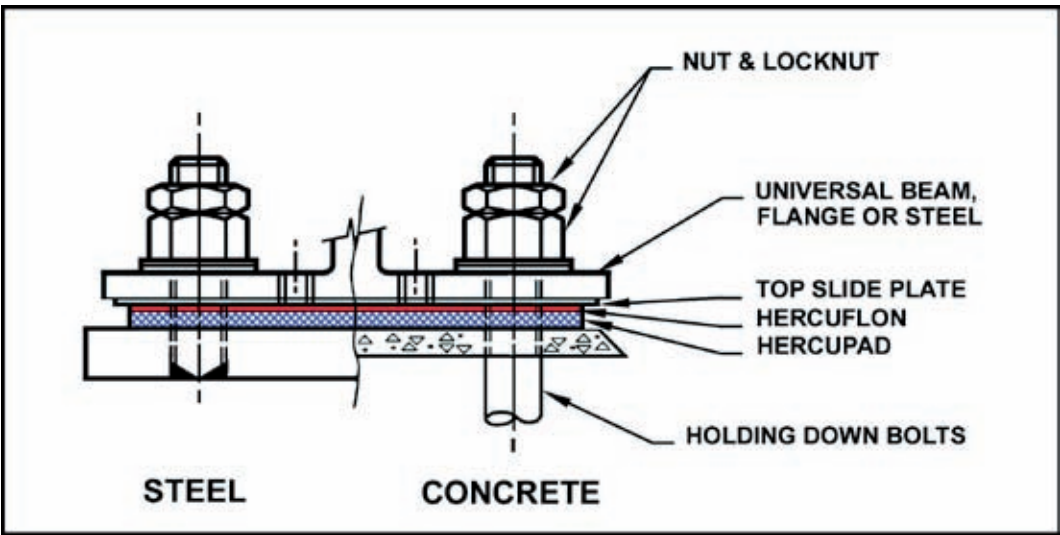


Fig 3-18 Installation of a Herculon Type D Tank Top Bearing

Ordering

Table 3-10 details the range of sizes available and Fig 3-19 provides the dimension reference points reflected in the table. These bearings are designed to fit standard UNIVERSAL BEAMS. The standard designs incorporate M20 bolts which should be adequate for most applications. Engineers should check that these bolts can accommodate the required uplift and lateral loads.

Table 3-10 Part Numbers for Herculon Type D Tank Top Bearing

Part Number	Working Load (kN)	Universal Beam		Bearing Dimensions (mm)				
		Section	Flange Width (approx mm)	Top Plate (±20 mm) C x D	Pad 0.01 rads F X G	Hole Centres H	Stud Centres E	Overall Dimensions C x D x H1
HLD/50 (TT)	50	200 UB	133	120 x 130	80 x 125 x 10	70	25	120 x 130 x 12
HLD/55 (TT)	55	250 UB	146	120 x 140	80 x 135 x 10	80	30	120 x 140 x 12
HLD/60 (TT)	60	310 UB & 360 UB	171	120 x 160	80 x 150 x 10	100	40	120 x 160 x 12
HLD/65 (TT)	65	410 UB	178	120 x 170	80 x 160 x 10	110	50	120 x 170 x 12
HLD/70 (TT)	70	460 UB	190	120 x 180	80 x 170 x 10	120	50	120 x 180 x 12

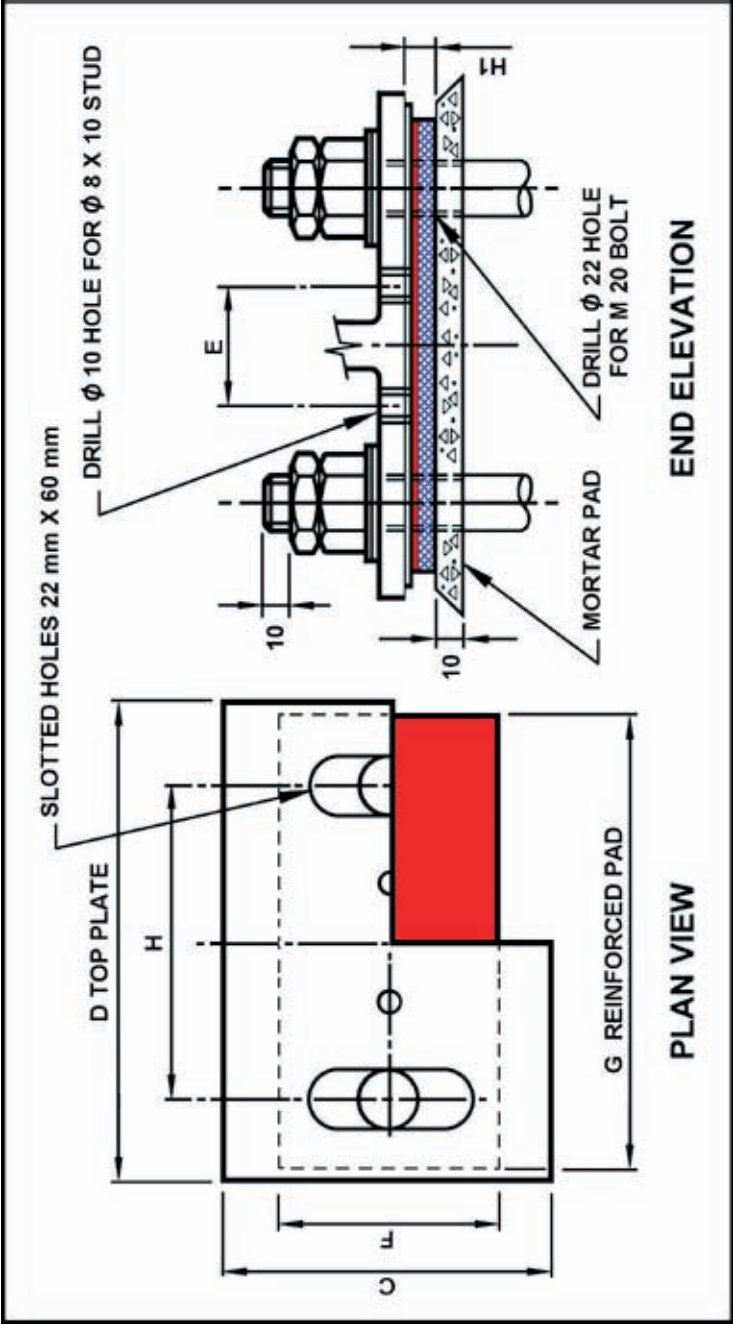


Fig 3-19 Dimension Reference Points

Table 3-11 Weight Range of Herculon Type D Free Float Bearings

Part Number	Weight Range (kg)	Part Number	Weight Range (kg)	Part Number	Weight Range (kg)
HLD/FF 75	1.5 - 2.5	HLD/FF 275	5.0 - 6.5	HLD/FF 475	8.5 - 11.0
HLD/FF 100	2.0 - 3.0	HLD/FF 300	5.5 - 7.0	HLD/FF 500	9.0 - 11.5
HLD/FF 125	2.5 - 3.5	HLD/FF 325	6.0 - 7.5	HLD/FF 525	9.0 - 12.0
HLD/FF 150	3.0 - 4.0	HLD/FF 350	6.0 - 8.0	HLD/FF 550	9.5 - 12.5
HLD/FF 175	3.5 - 4.5	HLD/FF 375	6.5 - 8.5	HLD/FF 575	10.0 - 13.0
HLD/FF 200	3.5 - 5.0	HLD/FF 400	7.0 - 9.0	HLD/FF 600	10.5 - 13.5
HLD/FF 225	4.0 - 5.5	HLD/FF 425	7.5 - 9.5	-	-
HLD/FF 250	4.5 - 6.0	HLD/FF 450	8.0 - 10.5	-	-

Table 3-12 Weights of HLD/SG and HLD/FX Bearings Used in Steel Structures

Sliding Guided Bearings - HLD/SG				Fixed Bearings - HLD/FX			
Part Number	Brg Wt (kg)	Part Number	Brg Wt (kg)	Part Number	Brg Wt (kg)	Part Number	Brg Wt (kg)
HLD/SG 100	11	HLD/SG 400	35	HLD/FX 100	5	HLD/FX 400	20
HLD/SG 200	17	HLD/SG 500	41	HLD/FX 200	9	HLD/FX 500	25
HLD/SG 300	23	HLD/SG 600	50	HLD/FX 300	13	HLD/FX 600	30

Table 3-13 Weights of HLD/SG and HLD/FX Bearings Used in Concrete Structures

Sliding Guided Bearings - HLD/SG (C)					Fixed Bearings - HLD/FX (C)				
Part Number	Brg Wt (kg)	Btm Att. PI (kg)	Top Att. PI (kg)	Total Wt (kg)	Part Number	Brg Wt (kg)	Btm Att. PI (kg)	Top Att. PI (kg)	Total Wt (kg)
HLD/SG 100 (C)	14	5	10	29	HLD/FX 100 (C)	9	5	5	19
HLD/SG 200 (C)	20	8	13	41	HLD/FX 200 (C)	14	8	7	29
HLD/SG 300 (C)	26	10	16	52	HLD/FX 300 (C)	18	10	9	37
HLD/SG 400 (C)	43	17	27	87	HLD/FX 400 (C)	29	17	15	61
HLD/SG 500 (C)	50	20	31	101	HLD/FX 500 (C)	35	20	17	72
HLD/SG 600 (C)	61	22	39	122	HLD/FX 600 (C)	41	22	20	83

Table 3-14 Herculon Type D Tank Top Bearing Weights

Part Number	Weight (kg)	Part Number	Weight (kg)	Part Number	Weight (kg)
HLD/50 (TT)	0.2	HLD/60 (TT)	0.4	HLD/70 (TT)	0.6
HLD/55 (TT)	0.3	HLD/65 (TT)	0.5	-	