

- ATHENS, GREECE -- VELODROME  
Vasoflon bearings for the roof covering

Cover photo:

- U.K. -- CHANNEL TUNNEL RAIL LINK

# INTRODUCTION

## CE MARKING

**FIP Industriale** is proud to be the first Italian manufacturer of structural bearings, anti-seismic devices and expansion joints boasting a Quality Assurance System certified at the highest level - from design to customer service assistance. Certification has been achieved via rigorous evaluation by an internationally recognized Third Party Organisation, thus internationally validating the quality assurance system.

**FIP Industriale** designs and manufactures its devices in accordance with the most widely adopted and stringent international specifications: EN, AASHTO, CNR, British Standards, DIN, NF. Moreover, **FIP Industriale** meets the most recent requirements by supplying bearings and anti-seismic devices with CE marking.

The certification ISO 9001, obtained in 1992, guarantees that the same quality level is kept from the design stage through manufacture to installation, while the Certificate OHS 618800 guarantees that **FIP Industriale** operates an Occupational Health and Safety Management System which complies with the requirements of BS OHSAS 18001:2007. **FIP Industriale** quality system is also certified to perform welding activities in accordance with EN ISO 3834-2 and DIN 18800-7.



OHS 618800



## PRODUCT

**Vasoflon**<sup>®</sup> are structural pot bearings, in which the rotations about any horizontal axis are ensured by the deformability of the elastomeric pad confined in a monolithic steel pot. The elastomer behaves like a fluid that, under a tri-axial pressure, offers low resistance to deformations but high vertical stiffness.

In addition to vertical compressive loads, **Vasoflon**<sup>®</sup> bearings are capable of transferring forces and/or slide in one or more directions of the horizontal plane depending on the different bearing types.

In the sliding bearings, translational movements are achieved through the mutual sliding of two flat mating surfaces, one of stainless steel and the other of PTFE.

## CLASSIFICATION

**Vasoflon**<sup>®</sup> bearings are classified using two letters followed by two or three groups of numbers with the following meanings:

|            |    |  |
|------------|----|--|
| <b>VF</b>  | => | Vasoflon <sup>®</sup> bearing, fixed type                          |
| <b>VU</b>  | => | Vasoflon <sup>®</sup> bearing, guided type, longitudinally sliding |
| <b>VU*</b> | => | Vasoflon <sup>®</sup> bearing, guided type, transversally sliding  |
| <b>VM</b>  | => | Vasoflon <sup>®</sup> bearing, free sliding type                   |

The first group of numbers represents the vertical load in kN/10 (t); the second group represents the total movement in mm (VU, VM), or the horizontal force in (kN/10) acting in the longitudinal direction (VU\*) or in all directions (VF); the third group of numbers represents the total transverse movement in mm (VU\*, VM) or the transverse horizontal force in kN/10 (VU). The loads and forces are at the Ultimate Limit State. For example:

|                       |   |
|-----------------------|---|
| <b>VF 3000-240</b>    | Vasoflon <sup>®</sup> bearing, fixed type, with a vertical capacity of 30000 kN able to transfer both longitudinally and transversally horizontal forces of 2400 kN.  |
| <b>VU 400/100-120</b> | Vasoflon <sup>®</sup> bearing, guided type, longitudinally sliding, with a vertical capacity of 4000 kN, that permits longitudinal movements of $\pm 50$ mm and is able to transfer transversally horizontal forces of 1200 kN. |
| <b>VU* 600-180/50</b> | Vasoflon <sup>®</sup> bearing, guided type, transversally sliding, with a vertical capacity of 6000 kN able to transfer longitudinally horizontal forces of 1800 kN and permit transverse movements of $\pm 25$ mm.             |
| <b>VM 1500/550/50</b> | Vasoflon <sup>®</sup> bearing, free sliding type, with a vertical capacity of 15000 kN that permits longitudinal movements of $\pm 275$ mm and transverse movements of $\pm 25$ mm.   |

# DESCRIPTION

## VASOFLON® FIXED TYPE

This bearing comprises:

- a lower steel element with a cylindrical recess (pot);
- an elastomeric pad contained in the pot;
- an upper steel element (piston) that is inserted into the pot.



## VASOFLON® GUIDED SLIDE TYPE

This bearing comprises:

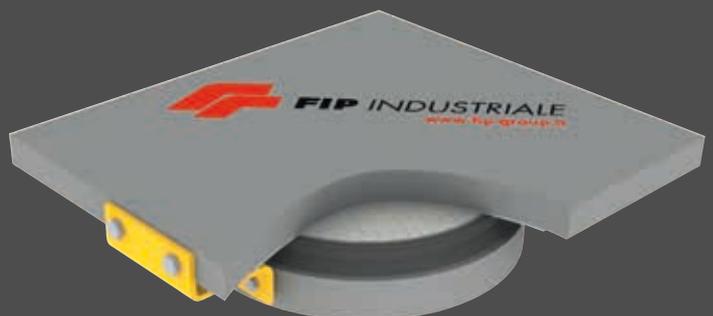
- a lower steel element with a cylindrical recess (pot);
- an elastomeric pad contained in the pot;
- an intermediate circular steel element (piston) that is inserted into the pot. Its upper side has a machined recess to house a dimpled PTFE sheet and a centrally arranged key (guide) capable of resisting forces perpendicular to it and determining the sliding direction of the bearing. Two CM1 type composite low friction material strips are bonded to the sides and screwed to the front ends of the guide to assure smooth sliding in the keyway of the upper sliding element covered with stainless steel;
- an upper sliding element, whose underside is covered with a pair of stainless steel sheets, which also cover the sides of the central keyway for the guide.



## VASOFLON® FREE SLIDING TYPE

This bearing comprises:

- a lower steel element with a cylindrical recess (pot);
- an elastomeric pad contained in the pot;
- an intermediate circular steel element (piston) that is inserted into the pot. Its upper side has a machined recess to house a dimpled PTFE sheet;
- an upper sliding element, whose underside is covered with stainless steel sheet.



# ANCHORING SYSTEMS

Applicable construction codes permitting, and if the ratio between the horizontal forces and the concurrent vertical loads is low enough, a mechanical anchoring system is not required; the friction itself is enough to secure the bearing to the the super and/or substructure. In this case, the surface of the bearing in contact with the concrete is provided with grooves to enhance bonding with epoxy resin.

It should be noted that *“In case of dynamically stressed structures where extreme load fluctuations can occur, e.g. railway bridges and earthquakes, the horizontal forces shall not be resisted by friction (EN 1337-1 §5.2)”*.

If mechanical anchoring is required in order to transfer the horizontal forces, the different types of upper and lower anchoring systems indicated below represent the most commonly adopted configurations.

## STEEL STRUCTURE

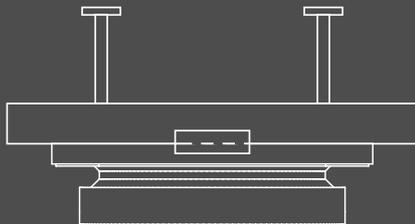
1. Shear pin in counterplate
2. Bolts connected to the structure or to counterplates

## PRECAST CONCRETE STRUCTURE

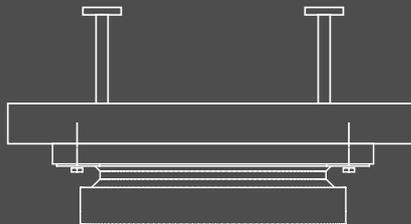
1. Shear pin in counterplate
2. Bolts connected to counterplates
3. Bolts and dowels (with pre-formed pockets in the structure)

## CAST IN SITU STRUCTURE

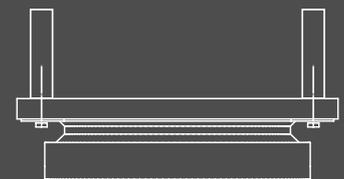
1. Shear pin in counterplate
2. Bolts connected to counterplates
3. Bolts and dowels



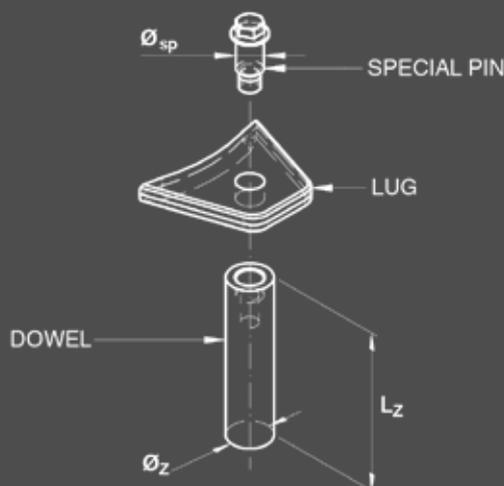
1. Shear pin in counterplate



2. Bolts connected to counterplates



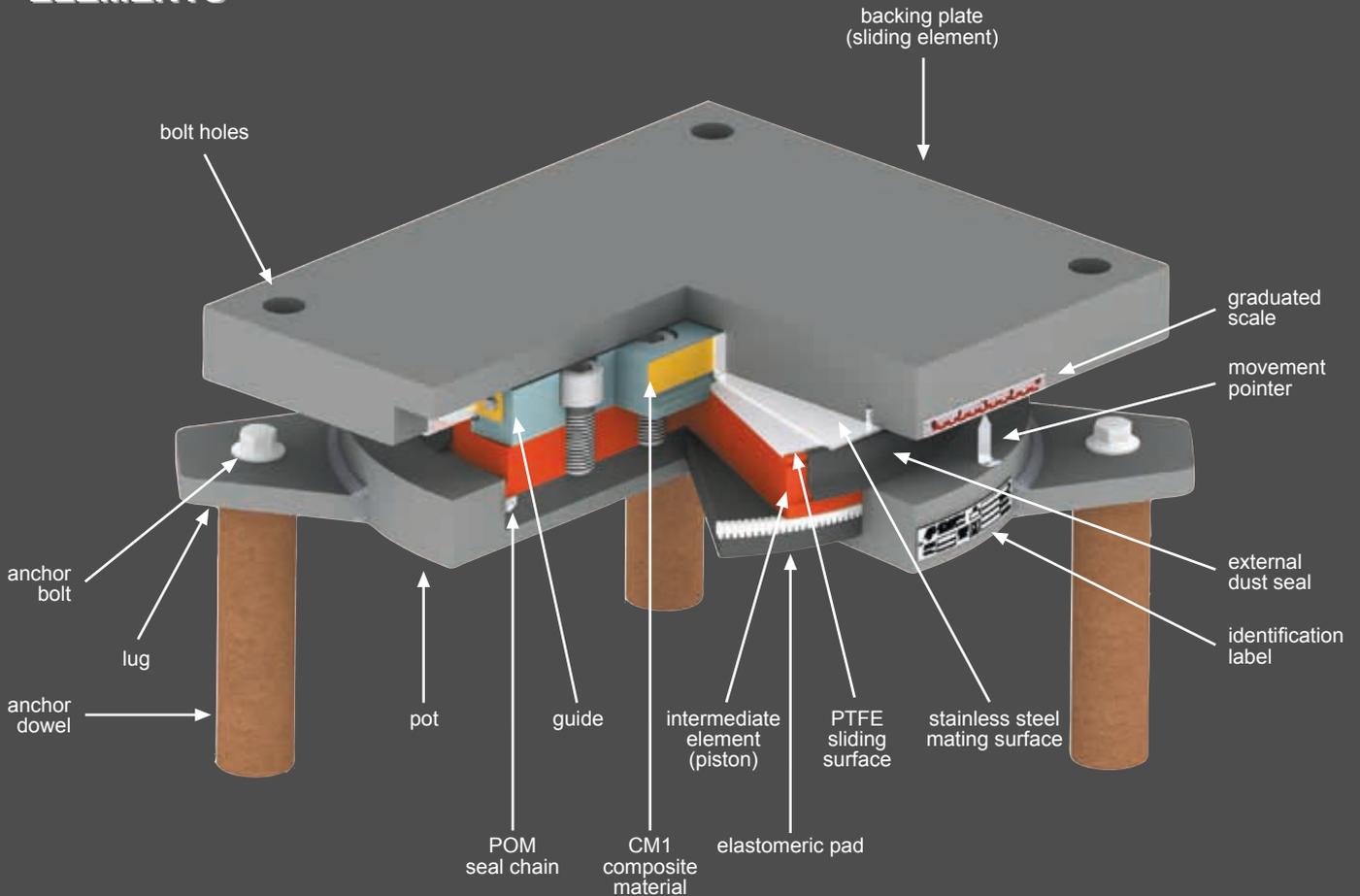
3. Bolts and dowels



| DOWEL TYPE | $\varnothing_{sp}$ (mm) | $\varnothing_z$ (mm) | $L_z$ (mm) |
|------------|-------------------------|----------------------|------------|
| 1          | 14                      | 25                   | 100        |
| 2          | 20                      | 35                   | 140        |
| 3          | 30                      | 55                   | 220        |
| 4          | 54                      | 100                  | 400        |

# BEARING COMPONENTS

## ELEMENTS



## MATERIALS

The materials used are in accordance with European standard EN 1337. In particular, the structural parts are made of S355 grade steel. Class X5CrNiMo 17-12-2 stainless steel with a minimum thickness of 2.5 mm is used for the sliding surfaces.

The elastomeric pad, with  $50 \pm 5$  Shore A hardness, has a POM (polyoxymethylene) seal chain vulcanised to its upper rim that prevents the extrusion of the elastomer from the pot, in accordance with EN 1337-5, Appendix A, section A 1.2. This makes **FIP Industriale** bearings especially suited for roadway, highway, and railway bridges (EN 1337-5 Appendix G).

The flat sliding surfaces (sliding bearings) are made of sheets of pure PTFE (polytetrafluoroethylene) free sintered without regenerated or filler materials.

The protrusion from the recess and the total thickness of the PTFE sheet, minimum 5 mm, are in compliance with EN 1337-2. Two CM1 type composite low friction material strips are bonded to the sides and screwed to the front ends of the guide in accordance with the requirements of EN 1337-2 (guided sliding bearings).

## ACCESSORIES

Every bearing is provided with an identification label showing its main technical information. Other accessories are the graduated scale and the movement pointer for the sliding bearings.

|   |                                    |  |                                |
|---|------------------------------------|--|--------------------------------|
|  <b>FIP INDUSTRIALE</b><br>via Scapacchiò 41 • Selvazzano PD • Italy • fipindustriale.it |                                    | ANNO YEAR <input type="text"/>                                 | TIPO TYPE <input type="text"/> |
| N° COMMESSA ORDER NUMBER <input type="text"/>   | SISTEMA QUALITÀ ISO 9001 / EN 3834 | CARICO VERTICALE MAX VERTICAL LOAD kN ULS <input type="text"/> |                                |
| N° SERIALE SERIAL NUMBER <input type="text"/>   | CERTIFICATO ICIM N. 0067/0941      | CARICO LATERALE MAX LATERAL LOAD kN ULS <input type="text"/>   |                                |
|       |                                    | SCORRIMENTO TOTALE MAX DISPLACEMENT mm <input type="text"/>    |                                |

# INDICATIONS

## CORROSION PROTECTION

The corrosion protection follows the indications given in EN 1337-9. The bearings are finished with a light grey (RAL 7035) unless otherwise requested. The bearing devices are supplied with an external dust seal and a dust scraper for the sliding surfaces.

## PRE-SETTING

The sliding plate of the sliding bearings can be pre-set in the workshop to cater for special construction requirements. The pre-setting values must be defined and communicated to **FIP Industriale** before the production process starts.

## HANDLING

The bearings are delivered assembled. The yellow brackets must not be removed before the device is installed and in any case not before the Engineer deems fit.

Use pallets to move the packaged bearings. They shall be properly harnessed and lifted using suitable mechanical equipment (crane, forklift). To handle the individual bearing use eyebolts to be screwed into the threaded holes on the upper side of the bearing. Dismounting the bearing device on site is not permitted for any reason.

## STORAGE

The bearing devices are delivered assembled and ready for installation. If they are not installed immediately, the Customer is responsible for ensuring that they are properly stored in order to prevent mechanical damages and harmful effects of dust, dirt, humidity, heat, pollutants, and other.

## INSTALLATION

The bearing devices are supplied with drawings and installation instructions. Customers and Engineers should feel free to contact **FIP Industriale**'s Technical Department for information on the most appropriate installation procedure based on the type of structure and its construction phases.



• U.K. -- KINCARDINE BRIDGE

# DESIGN CRITERIA

## DIMENSIONING DATA

FIP Industriale shall be provided at least with the following data to prepare an adequate technical **proposal**:

••• maximum axial force (vertical load)  $\longrightarrow$   $N_{sd, ULS}$

••• axial force (vertical load) concurrent with the maximum horizontal force

••• permanent axial force (vertical load)

••• maximum longitudinal horizontal force  $\longrightarrow$   $V_{long, ULS}$

••• maximum transverse horizontal force  $\longrightarrow$   $V_{trans, ULS}$

••• horizontal force concurrent with  $N_{sd}$

••• maximum rotation due to permanent actions

••• maximum rotation due to variable actions

••• maximum longitudinal movement in the worst Limit State condition (VU and VM bearings)

••• maximum transverse movement in the worst Limit State condition (VU\* and VM bearings)

••• type of deck (steel, cast *in situ* concrete, precast concrete)

••• characteristic compressive cylinder strength of upper concrete (for cast *in situ* or precast concrete)

••• characteristic compressive cylinder strength of lower concrete

••• longitudinal slope to be compensated for by the bearing (if any)

••• transverse slope to be compensated for by the bearing (if any)

••• type of upper anchoring system

••• type of lower anchoring system

Clarify finally whether the maximum horizontal force at ULS has to be considered seismic.

## SLIDING MOVEMENTS

Standard EN 1337 requires that the total design movement be increased by 40 mm and establishes a total minimum movement of 100 mm in the longitudinal direction. Therefore, the sliding bearings in the tables below provide the following movements:

**VU:** longitudinally = 100mm ( $\pm 50$ mm)

transversally = 0

**VU\*:** longitudinally = 0

transversally = 50mm ( $\pm 25$ mm)

**VM:** longitudinally = 100mm ( $\pm 50$ mm)

transversally = 50mm ( $\pm 25$ mm)

## ROTATIONS

Maximum design rotation due to permanent actions at ULS = 0.005 rad.

Maximum rotation due to variable actions at ULS = 0.005 rad.

Total maximum rotation, sum of the previous = 0.010 rad.

## ANCHORING SYSTEMS

The bearings listed in the tables consider the following anchoring options:

- upper anchoring system: bolts and dowels;  
epoxy resin bonding for free sliding bearings.
- lower anchoring system: bolts and dowels for fixed and guided sliding bearings;  
epoxy resin bonding for free sliding bearings.

The choice of anchoring systems other than the assumed ones might require a change in the bearing dimensions.

## SUPER AND SUBSTRUCTURE

Upper concrete class (if present)  $\geq$  C45/55

Upper concrete class (if present)  $\geq$  C35/45

$\sqrt{A_{c1}/A_{c0}}$  ratio = 2 where:

$A_{c0}$  = circular area of concrete loaded by the bearing or by the lower/upper counterplate

$A_{c1}$  =  $A_{c0}$  distribution into the upper/lower concrete

Permanent vertical load  $N_{Gd} = 0.6 N_{Sd}$

Effective temperatures between  $-5^{\circ}\text{C}$  y and  $30^{\circ}\text{C}$

No longitudinal or transverse slopes



• CROATIA -- KRKA BRIDGE  
Vasoflon bearings with fuse restraints

**FIP Industriale** also designs and manufactures non-standard CE marked bearings, based on loads other than those tabulated.

In order to easily select the most appropriate bearings for a correct restraint system for the different types of structures, you can consult the following tables covering the “standard” fixed, longitudinally guided sliding, transversally guided sliding, and free sliding **Vasoflon**<sup>®</sup> bearings.

The position of the anchoring elements and the final overall bearing dimensions are to be considered as indicative and have to be confirmed when defining the final bearing device. To cover the greatest number of cases, the two bearing types that transmit horizontal forces have further been divided into **Normal** and **High**, which differ for the lower or higher horizontal forces resisted.

# TABLES VASOFLO<sup>®</sup> FIXED TYPE

## VF NORMAL

| BEARING TYPE | DESIGN VERTICAL<br>LOAD<br>$N_{sd}$<br>ULS<br>kN | MAXIMUM<br>HORIZONTAL<br>LOAD<br>$V_{ULS}$<br>kN | BASE ELEMENT<br>DIAMETER<br>$D_o$<br>mm | DOWELS<br>(UPPER/LOWER) |      | UPPER ELEMENT<br>DIAMETER<br>$B$<br>mm | UPPER OVERALL<br>DIMENSIONS |                           | LOWER OVERALL<br>DIMENSIONS |                           | BEARING TOTAL<br>HEIGHT<br>$H_{tot}$<br>mm | BEARING WEIGHT<br>(EXCEPT<br>ANCHORINGS)<br>$W$<br>kg |
|--------------|--|--|---|-------------------------|------|--|-----------------------------|---------------------------|-----------------------------|---------------------------|--|---|
|              |  |  |   | $n$                     | type |  | TRANSVERSAL<br>$C$<br>mm    | LONGITUDINAL<br>$D$<br>mm | TRANSVERSAL<br>$G$<br>mm    | LONGITUDINAL<br>$F$<br>mm |  |   |
| VF 50-5      | 500  | 50   | 160                                     | 2/2                     | 1    | 150                                    | 150                         | 250                       | 160                         | 270                       | 69   | 9   |
| VF 100-10    | 1.000  | 100  | 210                                     | 4/4                     | 1    | 200                                    | 250                         | 250                       | 250                         | 250                       | 69   | 15  |
| VF 150-15    | 1.500  | 150  | 245                                     | 4/4                     | 1    | 235                                    | 270                         | 270                       | 280                         | 280                       | 73   | 22  |
| VF 200-20    | 2.000  | 200  | 285                                     | 4/4                     | 1    | 265                                    | 290                         | 290                       | 310                         | 310                       | 73   | 28  |
| VF 250-25    | 2.500  | 250  | 320                                     | 4/4                     | 1    | 295                                    | 320                         | 320                       | 330                         | 330                       | 77   | 38  |
| VF 300-30    | 3.000  | 300  | 350                                     | 4/4                     | 2    | 320                                    | 380                         | 380                       | 400                         | 400                       | 81   | 47  |
| VF 350-35    | 3.500  | 350  | 380                                     | 4/4                     | 2    | 345                                    | 400                         | 400                       | 420                         | 420                       | 86   | 59  |
| VF 400-40    | 4.000  | 400  | 405                                     | 4/4                     | 2    | 365                                    | 410                         | 410                       | 440                         | 440                       | 85   | 65  |
| VF 450-45    | 4.500  | 450  | 430                                     | 4/4                     | 2    | 385                                    | 430                         | 430                       | 460                         | 460                       | 89   | 77  |
| VF 500-50    | 5.000  | 500  | 455                                     | 4/4                     | 2    | 405                                    | 440                         | 440                       | 480                         | 480                       | 89   | 85  |
| VF 600-60    | 6.000  | 600  | 495                                     | 2/2                     | 3    | 440                                    | 500                         | 730                       | 440                         | 670                       | 103  | 116   |
| VF 700-70    | 7.000  | 700  | 535                                     | 4/4                     | 3    | 470                                    | 550                         | 550                       | 600                         | 600                       | 102  | 131   |
| VF 800-80    | 8.000  | 800  | 580                                     | 4/4                     | 3    | 510                                    | 580                         | 580                       | 630                         | 630                       | 106  | 171   |
| VF 900-90    | 9.000  | 900  | 610                                     | 4/4                     | 3    | 530                                    | 590                         | 590                       | 650                         | 650                       | 110  | 185   |
| VF 1000-100  | 10.000   | 1.000  | 640                                     | 4/4                     | 3    | 560                                    | 620                         | 620                       | 680                         | 680                       | 118  | 206   |
| VF 1100-110  | 11.000   | 1.100  | 675                                     | 4/4                     | 3    | 595                                    | 640                         | 640                       | 700                         | 700                       | 118  | 229   |
| VF 1200-120  | 12.000   | 1.200  | 705                                     | 4/4                     | 3    | 620                                    | 660                         | 660                       | 720                         | 720                       | 122  | 274   |
| VF 1300-130  | 13.000   | 1.300  | 735                                     | 4/4                     | 3    | 650                                    | 680                         | 680                       | 750                         | 750                       | 131  | 295   |
| VF 1400-140  | 14.000   | 1.400  | 765                                     | 6/6                     | 3    | 680                                    | 830                         | 920                       | 910                         | 1.010                     | 130  | 314   |
| VF 1500-150  | 15.000   | 1.500  | 790                                     | 6/6                     | 3    | 705                                    | 850                         | 950                       | 930                         | 1.040                     | 135  | 348   |
| VF 1600-160  | 16.000   | 1.600  | 815                                     | 6/6                     | 3    | 735                                    | 880                         | 980                       | 950                         | 1.060                     | 134  | 406   |
| VF 1700-170  | 17.000   | 1.700  | 840                                     | 6/6                     | 3    | 755                                    | 900                         | 1.000                     | 970                         | 1.090                     | 143  | 425   |
| VF 1800-180  | 18.000   | 1.800  | 865                                     | 6/6                     | 3    | 780                                    | 920                         | 1.020                     | 1.000                       | 1.110                     | 143  | 448   |
| VF 1900-190  | 19.000   | 1.900  | 885                                     | 6/6                     | 3    | 805                                    | 940                         | 1.050                     | 1.010                       | 1.130                     | 142  | 461   |
| VF 2000-200  | 20.000   | 2.000  | 910                                     | 8/8                     | 3    | 825                                    | 1.010                       | 1.010                     | 1.090                       | 1.090                     | 146  | 499   |
| VF 2250-210  | 22.500   | 2.100  | 970                                     | 8/8                     | 3    | 890                                    | 1.070                       | 1.070                     | 1.150                       | 1.150                     | 155  | 615   |
| VF 2500-220  | 25.000   | 2.200  | 1.020                                   | 8/8                     | 3    | 945                                    | 1.130                       | 1.130                     | 1.200                       | 1.200                     | 153  | 667   |
| VF 2750-230  | 27.500   | 2.300  | 1.065                                   | 8/8                     | 3    | 985                                    | 1.160                       | 1.160                     | 1.240                       | 1.240                     | 166  | 800   |
| VF 3000-240  | 30.000   | 2.400  | 1.105                                   | 8/8                     | 3    | 1.030                                  | 1.200                       | 1.200                     | 1.280                       | 1.280                     | 175  | 848   |
| VF 3250-250  | 32.500   | 2.500  | 1.150                                   | 8/8                     | 3    | 1.070                                  | 1.240                       | 1.240                     | 1.320                       | 1.320                     | 184  | 965   |
| VF 3500-260  | 35.000   | 2.600  | 1.190                                   | 8/8                     | 3    | 1.115                                  | 1.280                       | 1.280                     | 1.360                       | 1.360                     | 183  | 1.104   |
| VF 3750-270  | 37.500   | 2.700  | 1.230                                   | 12/12                   | 3    | 1.190                                  | 1.190                       | 1.390                     | 1.450                       | 1.230                     | 192  | 1.179   |
| VF 4000-280  | 40.000   | 2.800  | 1.270                                   | 12/12                   | 3    | 1.230                                  | 1.230                       | 1.430                     | 1.490                       | 1.270                     | 190  | 1.218   |
| VF 4500-320  | 45.000   | 3.200  | 1.345                                   | 12/12                   | 3    | 1.305                                  | 1.310                       | 1.510                     | 1.570                       | 1.350                     | 199  | 1.445   |
| VF 5000-350  | 50.000   | 3.500  | 1.425                                   | 12/12                   | 3    | 1.355                                  | 1.360                       | 1.580                     | 1.650                       | 1.430                     | 208  | 1.571   |
| VF 5500-390  | 55.000   | 3.900  | 1.500                                   | 4/4                     | 4    | 1.375                                  | 1.380                       | 1.380                     | 1.500                       | 1.500                     | 237  | 2.157   |
| VF 6000-420  | 60.000   | 4.200  | 1.565                                   | 4/4                     | 4    | 1.440                                  | 1.440                       | 1.440                     | 1.570                       | 1.570                     | 245  | 2.301   |
| VF 6500-460  | 65.000   | 4.600  | 1.630                                   | 6/6                     | 4    | 1.500                                  | 1.700                       | 1.900                     | 1.810                       | 2.030                     | 254  | 2.610   |
| VF 7000-490  | 70.000   | 4.900  | 1.690                                   | 6/6                     | 4    | 1.560                                  | 1.740                       | 1.960                     | 1.860                       | 2.100                     | 253  | 2.768   |
| VF 7500-530  | 75.000   | 5.300  | 1.755                                   | 6/6                     | 4    | 1.630                                  | 1.810                       | 2.030                     | 1.920                       | 2.160                     | 262  | 3.145   |
| VF 8000-560  | 80.000   | 5.600  | 1.820                                   | 6/6                     | 4    | 1.690                                  | 1.860                       | 2.090                     | 1.970                       | 2.230                     | 261  | 3.314   |
| VF 9000-630  | 90.000   | 6.300  | 1.925                                   | 6/6                     | 4    | 1.790                                  | 1.950                       | 2.190                     | 2.070                       | 2.330                     | 269  | 3.839   |
| VF 10000-700 | 100.000  | 7.000  | 2.040                                   | 8/8                     | 4    | 1.915                                  | 2.180                       | 2.180                     | 2.290                       | 2.290                     | 277  | 4.500   |

# VF HIGH

| BEARING TYPE  | DESIGN VERTICAL<br>LOAD<br>$N_{sd}$<br>kN | MAXIMUM<br>HORIZONTAL LOAD<br>$V_{ULS}$<br>kN | BASE ELEMENT<br>DIAMETER<br>$D_o$<br>mm | DOWELS<br>(UPPER/LOWER)<br>$n_b$<br>n type | UPPER ELEMENT<br>DIAMETER<br>$B$<br>mm | UPPER OVERALL<br>DIMENSIONS |                           | LOWER OVERALL<br>DIMENSIONS |                           | BEARING TOTAL<br>HEIGHT<br>$H_{tot}$<br>mm | BEARING WEIGHT<br>(EXCEPT<br>ANCHORINGS)<br>$W$<br>kg |
|---------------|---|---|---|--|--|-----------------------------|---------------------------|-----------------------------|---------------------------|--|---|
|               |   |   |   |  |  | TRANSVERSAL<br>$C$<br>mm    | LONGITUDINAL<br>$D$<br>mm | TRANSVERSAL<br>$G$<br>mm    | LONGITUDINAL<br>$F$<br>mm |  |   |
| VF 50-15      | 500                                       | 150   | 160                                     | 4/4 1                                      | 150                                    | 210                         | 210                       | 220                         | 220                       | 69   | 8   |
| VF 100-30     | 1.000                                     | 300   | 225                                     | 4/4 2                                      | 200                                    | 280                         | 280                       | 300                         | 300                       | 77   | 19  |
| VF 150-45     | 1.500                                     | 450   | 280                                     | 4/4 2                                      | 255                                    | 320                         | 320                       | 350                         | 350                       | 76   | 29  |
| VF 200-60     | 2.000                                     | 600   | 325                                     | 4/4 3                                      | 265                                    | 380                         | 380                       | 440                         | 440                       | 90   | 41  |
| VF 250-75     | 2.500                                     | 750   | 365                                     | 4/4 3                                      | 315                                    | 530                         | 530                       | 470                         | 470                       | 89   | 53  |
| VF 300-90     | 3.000                                     | 900   | 400                                     | 4/4 3                                      | 350                                    | 570                         | 570                       | 500                         | 500                       | 93   | 71  |
| VF 350-105    | 3.500                                     | 1.050   | 440                                     | 4/4 3                                      | 385                                    | 600                         | 600                       | 530                         | 530                       | 92   | 85  |
| VF 400-120    | 4.000                                     | 1.200   | 465                                     | 4/4 3                                      | 405                                    | 630                         | 630                       | 550                         | 550                       | 97   | 100   |
| VF 450-135    | 4.500                                     | 1.350   | 495                                     | 6/6 3                                      | 425                                    | 600                         | 650                       | 670                         | 730                       | 96   | 110   |
| VF 500-150    | 5.000                                     | 1.500   | 520                                     | 6/6 3                                      | 450                                    | 620                         | 680                       | 690                         | 760                       | 100  | 129   |
| VF 600-180    | 6.000                                     | 1.800   | 570                                     | 6/6 3                                      | 500                                    | 670                         | 730                       | 730                         | 810                       | 108  | 178   |
| VF 700-210    | 7.000                                     | 2.100   | 620                                     | 8/8 3                                      | 580                                    | 580                         | 760                       | 800                         | 620                       | 112  | 215   |
| VF 800-240    | 8.000                                     | 2.400   | 670                                     | 8/8 3                                      | 630                                    | 630                         | 810                       | 850                         | 670                       | 111  | 246   |
| VF 900-270    | 9.000                                     | 2.700   | 705                                     | 12/12 3                                    | 645                                    | 650                         | 870                       | 930                         | 710                       | 119  | 304   |
| VF 1000-300   | 10.000                                    | 3.000   | 740                                     | 12/12 3                                    | 680                                    | 700                         | 900                       | 960                         | 740                       | 123  | 330   |
| VF 1100-330   | 11.000                                    | 3.300   | 785                                     | 12/12 3                                    | 720                                    | 950                         | 720                       | 990                         | 790                       | 132  | 367   |
| VF 1200-360   | 12.000                                    | 3.600   | 815                                     | 12/12 3                                    | 780                                    | 980                         | 780                       | 1.020                       | 820                       | 135  | 411   |
| VF 1300-390   | 13.000                                    | 3.900   | 850                                     | 12/12 3                                    | 815                                    | 1.030                       | 820                       | 1.050                       | 850                       | 134  | 487   |
| VF 1400-420   | 14.000                                    | 4.200   | 885                                     | 16/16 3                                    | 850                                    | 1.070                       | 850                       | 1.110                       | 890                       | 144  | 524   |
| VF 1500-450   | 15.000                                    | 4.500   | 920                                     | 16/16 3                                    | 920                                    | 1.140                       | 920                       | 1.140                       | 920                       | 143  | 573   |
| VF 1600-480   | 16.000                                    | 4.800   | 940                                     | 6/6 4                                      | 830                                    | 1.210                       | 1.090                     | 1.200                       | 1.330                     | 167  | 654   |
| VF 1700-510   | 17.000                                    | 5.100   | 985                                     | 6/6 4                                      | 875                                    | 1.250                       | 1.130                     | 1.240                       | 1.380                     | 175  | 776   |
| VF 1800-540   | 18.000                                    | 5.400   | 1.020                                   | 6/6 4                                      | 910                                    | 1.290                       | 1.160                     | 1.270                       | 1.410                     | 174  | 833   |
| VF 1900-570   | 19.000                                    | 5.700   | 1.045                                   | 6/6 4                                      | 935                                    | 1.320                       | 1.190                     | 1.290                       | 1.440                     | 173  | 867   |
| VF 2000-600   | 20.000                                    | 6.000   | 1.075                                   | 6/6 4                                      | 965                                    | 1.350                       | 1.210                     | 1.320                       | 1.470                     | 192  | 959   |
| VF 2250-630   | 22.500                                    | 6.300   | 1.125                                   | 6/6 4                                      | 1.015                                  | 1.400                       | 1.260                     | 1.360                       | 1.520                     | 191  | 1.113   |
| VF 2500-660   | 25.000                                    | 6.600   | 1.245                                   | 8/8 4                                      | 1.135                                  | 1.440                       | 1.440                     | 1.640                       | 1.640                     | 190  | 1.363   |
| VF 2750-690   | 27.500                                    | 6.900   | 1.225                                   | 8/8 4                                      | 1.115                                  | 1.420                       | 1.420                     | 1.620                       | 1.620                     | 199  | 1.278   |
| VF 3000-720   | 30.000                                    | 7.200   | 1.265                                   | 8/8 4                                      | 1.155                                  | 1.460                       | 1.460                     | 1.660                       | 1.660                     | 197  | 1.443   |
| VF 3250-750   | 32.500                                    | 7.500   | 1.310                                   | 8/8 4                                      | 1.200                                  | 1.500                       | 1.500                     | 1.710                       | 1.710                     | 205  | 1.522   |
| VF 3500-780   | 35.000                                    | 7.800   | 1.350                                   | 8/8 4                                      | 1.240                                  | 1.540                       | 1.540                     | 1.750                       | 1.750                     | 204  | 1.713   |
| VF 3750-820   | 37.500                                    | 8.200   | 1.400                                   | 8/8 4                                      | 1.290                                  | 1.590                       | 1.590                     | 1.800                       | 1.800                     | 205  | 1.842   |
| VF 4000-860   | 40.000                                    | 8.600   | 1.440                                   | 8/8 4                                      | 1.330                                  | 1.620                       | 1.620                     | 1.840                       | 1.840                     | 225  | 2.015   |
| VF 4500-900   | 45.000                                    | 9.000   | 1.520                                   | 8/8 4                                      | 1.410                                  | 1.780                       | 1.780                     | 1.890                       | 1.890                     | 231  | 2.319   |
| VF 5000-1000  | 50.000                                    | 10.000  | 1.605                                   | 12/12 4                                    | 1.495                                  | 1.870                       | 1.870                     | 1.980                       | 1.980                     | 240  | 2.556   |
| VF 5500-1100  | 55.000                                    | 11.000  | 1.690                                   | 12/12 4                                    | 1.580                                  | 1.950                       | 1.950                     | 2.060                       | 2.060                     | 239  | 2.977   |
| VF 6000-1200  | 60.000                                    | 12.000  | 1.765                                   | 12/12 4                                    | 1.655                                  | 2.030                       | 2.030                     | 2.140                       | 2.140                     | 247  | 3.207   |
| VF 6500-1300  | 65.000                                    | 13.000  | 1.840                                   | 16/16 4                                    | 1.730                                  | 2.100                       | 2.100                     | 2.210                       | 2.210                     | 246  | 3.656   |
| VF 7000-1400  | 70.000                                    | 14.000  | 1.905                                   | 16/16 4                                    | 1.795                                  | 2.170                       | 2.170                     | 2.280                       | 2.280                     | 254  | 3.867   |
| VF 7500-1500  | 75.000                                    | 15.000  | 1.980                                   | 16/16 4                                    | 1.870                                  | 2.240                       | 2.240                     | 2.350                       | 2.350                     | 273  | 4.512   |
| VF 8000-1600  | 80.000                                    | 16.000  | 2.055                                   | 16/16 4                                    | 1.945                                  | 2.320                       | 2.320                     | 2.430                       | 2.430                     | 272  | 4.800   |
| VF 9000-1700  | 90.000                                    | 17.000  | 2.170                                   | 16/16 4                                    | 2.060                                  | 2.430                       | 2.430                     | 2.540                       | 2.540                     | 280  | 5.548   |
| VF 10000-1800 | 100.000                                   | 18.000  | 2.275                                   | 20/20 4                                    | 2.165                                  | 2.540                       | 2.540                     | 2.650                       | 2.650                     | 288  | 6.306   |

# TABLES VASOFLON® LONGITUDINALLY GUIDED SLIDING TYPE

**VU**  
**NORMAL**

| BEARING TYPE     | DESIGN VERTICAL LOAD<br>N <sub>sd</sub> ULS<br>kN | MAXIMUM HORIZONTAL LOAD<br>V <sub>ULS</sub><br>kN | BASE ELEMENT DIAMETER<br>D <sub>o</sub><br>mm | DOWELS (UPPER/LOWER) |      | UPPER OVERALL DIMENSIONS |         | LOWER OVERALL DIMENSIONS |         | BEARING TOTAL HEIGHT<br>H <sub>tot</sub><br>mm | BEARING WEIGHT (EXCEPT ANCHORINGS)<br>W<br>kg |
|------------------|---|---|---|----------------------|------|--------------------------|---------|--------------------------|---------|--|---|
|                  |   |   |   | n                    | type | C<br>mm                  | D<br>mm | G<br>mm                  | F<br>mm |  |   |
| VU 50/100-5      | 500   | 50  | 160   | 4/2                  | 1    | 270                      | 315     | 270                      | 160     | 108  | 23  |
| VU 100/100-10    | 1.000   | 100   | 245   | 4/4                  | 1    | 270                      | 335     | 280                      | 280     | 98   | 36  |
| VU 150/100-15    | 1.500   | 150   | 275   | 4/4                  | 1    | 275                      | 365     | 300                      | 300     | 97   | 44  |
| VU 200/100-20    | 2.000   | 200   | 310   | 4/4                  | 1    | 305                      | 395     | 330                      | 330     | 104  | 59  |
| VU 250/100-25    | 2.500   | 250   | 335   | 4/4                  | 1    | 320                      | 410     | 350                      | 350     | 104  | 66  |
| VU 300/100-30    | 3.000   | 300   | 370   | 4/4                  | 2    | 355                      | 445     | 420                      | 420     | 108  | 85  |
| VU 350/100-35    | 3.500   | 350   | 395   | 4/4                  | 2    | 380                      | 470     | 430                      | 430     | 111  | 97  |
| VU 400/100-40    | 4.000   | 400   | 420   | 4/4                  | 2    | 395                      | 485     | 450                      | 450     | 120  | 117   |
| VU 450/100-45    | 4.500   | 450   | 445   | 4/4                  | 2    | 415                      | 505     | 470                      | 470     | 120  | 130   |
| VU 500/100-50    | 5.000   | 500   | 480   | 4/4                  | 2    | 450                      | 540     | 500                      | 500     | 124  | 154   |
| VU 600/100-60    | 6.000   | 600   | 520   | 4/4                  | 3    | 480                      | 570     | 750                      | 520     | 123  | 180   |
| VU 700/100-70    | 7.000   | 700   | 570   | 4/4                  | 3    | 490                      | 495     | 630                      | 630     | 122  | 204   |
| VU 800/100-80    | 8.000   | 800   | 580   | 4/4                  | 3    | 525                      | 615     | 630                      | 630     | 127  | 224   |
| VU 900/100-90    | 9.000   | 900   | 610   | 4/4                  | 3    | 540                      | 630     | 650                      | 650     | 136  | 257   |
| VU 1000/100-100  | 10.000  | 1.000   | 640   | 4/4                  | 3    | 575                      | 665     | 680                      | 680     | 134  | 282   |
| VU 1100/100-110  | 11.000  | 1.100   | 675   | 4/4                  | 3    | 610                      | 700     | 700                      | 700     | 149  | 364   |
| VU 1200/100-120  | 12.000  | 1.200   | 705   | 4/4                  | 3    | 635                      | 725     | 720                      | 720     | 153  | 404   |
| VU 1300/100-130  | 13.000  | 1.300   | 735   | 4/4                  | 3    | 645                      | 735     | 750                      | 750     | 177  | 493   |
| VU 1400/100-140  | 14.000  | 1.400   | 765   | 8/8                  | 3    | 665                      | 890     | 910                      | 1.010   | 176  | 558   |
| VU 1500/100-150  | 15.000  | 1.500   | 790   | 8/8                  | 3    | 690                      | 900     | 930                      | 1.040   | 176  | 589   |
| VU 1600/100-160  | 16.000  | 1.600   | 815   | 8/8                  | 3    | 710                      | 915     | 950                      | 1.060   | 175  | 614   |
| VU 1700/100-170  | 17.000  | 1.700   | 840   | 8/8                  | 3    | 730                      | 935     | 970                      | 1.090   | 184  | 687   |
| VU 1800/100-180  | 18.000  | 1.800   | 865   | 8/8                  | 3    | 750                      | 950     | 1.000                    | 1.110   | 184  | 721   |
| VU 1900/100-190  | 19.000  | 1.900   | 885   | 8/8                  | 3    | 770                      | 955     | 1.010                    | 1.130   | 188  | 756   |
| VU 2000/100-200  | 20.000  | 2.000   | 910   | 8/8                  | 3    | 790                      | 970     | 1.090                    | 1.090   | 187  | 789   |
| VU 2250/100-210  | 22.500  | 2.100   | 970   | 8/8                  | 3    | 835                      | 1.010   | 1.150                    | 1.150   | 201  | 947   |
| VU 2500/100-220  | 25.000  | 2.200   | 1.020   | 8/8                  | 3    | 880                      | 1.035   | 1.200                    | 1.200   | 200  | 1.015   |
| VU 2750/100-230  | 27.500  | 2.300   | 1.065   | 8/8                  | 3    | 930                      | 1.050   | 1.240                    | 1.240   | 214  | 1.178   |
| VU 3000/100-240  | 30.000  | 2.400   | 1.105   | 8/8                  | 3    | 955                      | 1.080   | 1.280                    | 1.280   | 223  | 1.317   |
| VU 3250/100-250  | 32.500  | 2.500   | 1.150   | 8/8                  | 3    | 995                      | 1.095   | 1.320                    | 1.320   | 252  | 1.630   |
| VU 3500/100-260  | 35.000  | 2.600   | 1.190   | 8/8                  | 3    | 1.040                    | 1.140   | 1.360                    | 1.360   | 256  | 1.773   |
| VU 3750/100-270  | 37.500  | 2.700   | 1.230   | 12/12                | 3    | 1.065                    | 1.165   | 1.450                    | 1.230   | 265  | 1.933   |
| VU 4000/100-280  | 40.000  | 2.800   | 1.270   | 12/12                | 3    | 1.100                    | 1.200   | 1.490                    | 1.270   | 264  | 2.052   |
| VU 4500/100-320  | 45.000  | 3.200   | 1.345   | 12/12                | 3    | 1.170                    | 1.270   | 1.570                    | 1.350   | 278  | 2.425   |
| VU 5000/100-350  | 50.000  | 3.500   | 1.425   | 12/12                | 3    | 1.230                    | 1.330   | 1.670                    | 1.430   | 287  | 2.789   |
| VU 5500/100-390  | 55.000  | 3.900   | 1.500   | 4/4                  | 4    | 1.290                    | 1.380   | 1.500                    | 1.500   | 286  | 3.069   |
| VU 6000/100-420  | 60.000  | 4.200   | 1.565   | 4/4                  | 4    | 1.345                    | 1.435   | 1.570                    | 1.570   | 298  | 3.478   |
| VU 6500/100-460  | 65.000  | 4.600   | 1.630   | 8/8                  | 4    | 1.405                    | 1.695   | 1.810                    | 2.030   | 307  | 4.082   |
| VU 7000/100-490  | 70.000  | 4.900   | 1.690   | 8/8                  | 4    | 1.445                    | 1.740   | 1.860                    | 2.100   | 306  | 4.306   |
| VU 7500/100-530  | 75.000  | 5.300   | 1.755   | 8/8                  | 4    | 1.505                    | 1.770   | 1.920                    | 2.160   | 325  | 4.886   |
| VU 8000/100-560  | 80.000  | 5.600   | 1.820   | 8/8                  | 4    | 1.565                    | 1.805   | 1.970                    | 2.230   | 324  | 5.163   |
| VU 9000/100-630  | 90.000  | 6.300   | 1.925   | 8/8                  | 4    | 1.645                    | 1.870   | 2.070                    | 2.330   | 332  | 5.839   |
| VU 10000/100-700 | 100.000   | 7.000   | 2.040   | 8/8                  | 4    | 1.725                    | 1.955   | 2.290                    | 2.290   | 340  | 6.657   |

For the **transversally guided sliding type (VU\*)** the characteristics shall be taken from the tables for VU, except for the length of the upper element "D", which shall be reduced by 50 mm.

**VU  
HIGH**

| BEARING TYPE      | DESIGN VERTICAL LOAD<br>$N_{sd}$ ULS<br>kN | MAXIMUM HORIZONTAL LOAD<br>$V_{ULS}$<br>kN | BASE ELEMENT DIAMETER<br>$D_0$<br>mm | DOWELS (UPPER/LOWER)<br>$n_b$<br>n type | UPPER OVERALL DIMENSIONS |                         | LOWER OVERALL DIMENSIONS |                         | BEARING TOTAL HEIGHT<br>$H_{tot}$<br>mm | BEARING WEIGHT (EXCEPT ANCHORINGS)<br>$W$<br>kg |        |
|-------------------|--|--|--------------------------------------|---|--------------------------|-------------------------|--------------------------|-------------------------|---|---|--------|
|                   |  |  |                                      |   | TRANSVERSAL<br>C<br>mm   | LONGITUDINAL<br>D<br>mm | TRANSVERSAL<br>G<br>mm   | LONGITUDINAL<br>F<br>mm |   |   |        |
| VU 50/100-15      | 500  | 150  | 290                                  | 4/4                                     | 1                        | 305                     | 395                      | 310                     | 310                                     | 102   | 53     |
| VU 100/100-30     | 1.000                                      | 300  | 305                                  | 4/4                                     | 2                        | 300                     | 410                      | 370                     | 370                                     | 114   | 67     |
| VU 150/100-45     | 1.500                                      | 450  | 350                                  | 4/4                                     | 2                        | 355                     | 445                      | 400                     | 400                                     | 133   | 91     |
| VU 200/100-60     | 2.000                                      | 600  | 370                                  | 4/4                                     | 3                        | 375                     | 515                      | 470                     | 470                                     | 146   | 141    |
| VU 250/100-75     | 2.500                                      | 750  | 385                                  | 4/4                                     | 3                        | 355                     | 505                      | 480                     | 480                                     | 145   | 135    |
| VU 300/100-90     | 3.000                                      | 900  | 455                                  | 4/4                                     | 3                        | 415                     | 535                      | 540                     | 540                                     | 149   | 181    |
| VU 350/100-105    | 3.500                                      | 1.050                                      | 485                                  | 4/4                                     | 3                        | 415                     | 545                      | 560                     | 560                                     | 148   | 190    |
| VU 400/100-120    | 4.000                                      | 1.200                                      | 550                                  | 4/4                                     | 3                        | 490                     | 580                      | 610                     | 610                                     | 161   | 263    |
| VU 450/100-135    | 4.500                                      | 1.350                                      | 570                                  | 8/8                                     | 3                        | 510                     | 770                      | 730                     | 810                                     | 160   | 317    |
| VU 500/100-150    | 5.000                                      | 1.500                                      | 545                                  | 8/8                                     | 3                        | 510                     | 760                      | 710                     | 780                                     | 165   | 311    |
| VU 600/100-180    | 6.000                                      | 1.800                                      | 600                                  | 8/8                                     | 3                        | 535                     | 775                      | 760                     | 840                                     | 168   | 354    |
| VU 700/100-210    | 7.000                                      | 2.100                                      | 675                                  | 8/8                                     | 3                        | 565                     | 785                      | 870                     | 870                                     | 172   | 414    |
| VU 800/100-240    | 8.000                                      | 2.400                                      | 705                                  | 8/8                                     | 3                        | 595                     | 795                      | 900                     | 900                                     | 191   | 499    |
| VU 900/100-270    | 9.000                                      | 2.700                                      | 745                                  | 12/12                                   | 3                        | 610                     | 800                      | 970                     | 750                                     | 195   | 552    |
| VU 1000/100-300   | 10.000                                     | 3.000                                      | 785                                  | 12/12                                   | 3                        | 635                     | 815                      | 1.010                   | 790                                     | 214   | 673    |
| VU 1100/100-330   | 11.000                                     | 3.300                                      | 835                                  | 12/12                                   | 3                        | 680                     | 830                      | 1.060                   | 840                                     | 212   | 738    |
| VU 1200/100-360   | 12.000                                     | 3.600                                      | 850                                  | 12/12                                   | 3                        | 680                     | 830                      | 1.070                   | 850                                     | 226   | 782    |
| VU 1300/100-390   | 13.000                                     | 3.900                                      | 895                                  | 4/4                                     | 4                        | 720                     | 1.010                    | 980                     | 980                                     | 235   | 1.007  |
| VU 1400/100-420   | 14.000                                     | 4.200                                      | 930                                  | 4/4                                     | 4                        | 745                     | 1.035                    | 1.010                   | 1.010                                   | 234   | 1.071  |
| VU 1500/100-450   | 15.000                                     | 4.500                                      | 975                                  | 8/8                                     | 4                        | 780                     | 1.365                    | 1.230                   | 1.370                                   | 244   | 1.381  |
| VU 1600/100-480   | 16.000                                     | 4.800                                      | 1.020                                | 8/8                                     | 4                        | 800                     | 1.410                    | 1.270                   | 1.410                                   | 251   | 1.516  |
| VU 1700/100-510   | 17.000                                     | 5.100                                      | 1.065                                | 8/8                                     | 4                        | 845                     | 1.430                    | 1.310                   | 1.460                                   | 251   | 1.627  |
| VU 1800/100-540   | 18.000                                     | 5.400                                      | 1.115                                | 8/8                                     | 4                        | 880                     | 1.470                    | 1.350                   | 1.510                                   | 260   | 1.821  |
| VU 1900/100-570   | 19.000                                     | 5.700                                      | 1.160                                | 8/8                                     | 4                        | 920                     | 1.495                    | 1.390                   | 1.560                                   | 259   | 1.936  |
| VU 2000/100-600   | 20.000                                     | 6.000                                      | 1.200                                | 8/8                                     | 4                        | 965                     | 1.510                    | 1.430                   | 1.600                                   | 268   | 2.139  |
| VU 2250/100-630   | 22.500                                     | 6.300                                      | 1.215                                | 8/8                                     | 4                        | 965                     | 1.530                    | 1.440                   | 1.610                                   | 267   | 2.175  |
| VU 2500/100-660   | 25.000                                     | 6.600                                      | 1.260                                | 8/8                                     | 4                        | 1.005                   | 1.555                    | 1.560                   | 1.560                                   | 266   | 2.301  |
| VU 2750/100-690   | 27.500                                     | 6.900                                      | 1.305                                | 8/8                                     | 4                        | 1.040                   | 1.585                    | 1.610                   | 1.610                                   | 275   | 2.537  |
| VU 3000/100-720   | 30.000                                     | 7.200                                      | 1.315                                | 8/8                                     | 4                        | 1.030                   | 1.605                    | 1.620                   | 1.620                                   | 285   | 2.682  |
| VU 3250/100-750   | 32.500                                     | 7.500                                      | 1.330                                | 8/8                                     | 4                        | 1.030                   | 1.625                    | 1.630                   | 1.630                                   | 285   | 2.731  |
| VU 3500/100-780   | 35.000                                     | 7.800                                      | 1.375                                | 8/8                                     | 4                        | 1.075                   | 1.645                    | 1.670                   | 1.670                                   | 298   | 3.028  |
| VU 3750/100-820   | 37.500                                     | 8.200                                      | 1.400                                | 8/8                                     | 4                        | 1.085                   | 1.670                    | 1.700                   | 1.700                                   | 298   | 3.126  |
| VU 4000/100-860   | 40.000                                     | 8.600                                      | 1.440                                | 8/8                                     | 4                        | 1.135                   | 1.685                    | 1.730                   | 1.730                                   | 307   | 3.399  |
| VU 4500/100-900   | 45.000                                     | 9.000                                      | 1.570                                | 12/12                                   | 4                        | 1.230                   | 1.775                    | 1.940                   | 1.570                                   | 306   | 3.943  |
| VU 5000/100-1000  | 50.000                                     | 10.000                                     | 1.650                                | 12/12                                   | 4                        | 1.290                   | 1.830                    | 2.020                   | 1.650                                   | 333   | 4.634  |
| VU 5500/100-1100  | 55.000                                     | 11.000                                     | 1.765                                | 12/12                                   | 4                        | 1.395                   | 1.890                    | 2.140                   | 1.770                                   | 341   | 5.348  |
| VU 6000/100-1200  | 60.000                                     | 12.000                                     | 1.840                                | 12/12                                   | 4                        | 1.445                   | 1.945                    | 2.210                   | 1.840                                   | 349   | 5.912  |
| VU 6500/100-1300  | 65.000                                     | 13.000                                     | 1.910                                | 16/16                                   | 4                        | 1.495                   | 2.295                    | 2.280                   | 1.910                                   | 357   | 6.916  |
| VU 7000/100-1400  | 70.000                                     | 14.000                                     | 1.990                                | 16/16                                   | 4                        | 1.555                   | 2.350                    | 2.360                   | 1.990                                   | 376   | 7.758  |
| VU 7500/100-1500  | 75.000                                     | 15.000                                     | 2.080                                | 16/16                                   | 4                        | 1.635                   | 1.855                    | 2.450                   | 2.080                                   | 384   | 7.696  |
| VU 8000/100-1600  | 80.000                                     | 16.000                                     | 2.195                                | 16/16                                   | 4                        | 1.720                   | 1.890                    | 2.570                   | 2.200                                   | 393   | 8.659  |
| VU 9000/100-1700  | 90.000                                     | 17.000                                     | 2.355                                | 16/16                                   | 4                        | 1.855                   | 2.570                    | 2.730                   | 2.360                                   | 400   | 11.096 |
| VU 10000/100-1800 | 100.000                                    | 18.000                                     | 2.370                                | 20/20                                   | 4                        | 1.855                   | 2.890                    | 2.740                   | 2.370                                   | 409   | 12.107 |

For the **transversally guided sliding type (VU\*)** the characteristics shall be taken from the tables for VU, except for the length of the upper element "D", which shall be reduced by 50 mm.

# TABLE VASOFLON® FREE SLIDING TYPE

## VM

UPPER OVERALL  
DIMENSIONS

| BEARING TYPE    | DESIGN VERTICAL<br>LOAD | BASE ELEMENT<br>DIAMETER | TRANSVERSAL | LONGITUDINAL | BEARING TOTAL<br>HEIGHT | BEARING WEIGHT<br>(EXCEPT<br>ANCHORINGS) |
|-----------------|-------------------------|--------------------------|-------------|--------------|-------------------------|--|
|                 | $N_{sd}$ ULS<br>kN      |                          |             |              |                         |  |
| VM 50/100/50    | 500                     | 160                      | 270         | 270          | 89                      | 22                                       |
| VM 100/100/50   | 1.000                   | 210                      | 270         | 335          | 89                      | 30                                       |
| VM 150/100/50   | 1.500                   | 245                      | 295         | 360          | 93                      | 40                                       |
| VM 200/100/50   | 2.000                   | 275                      | 315         | 365          | 93                      | 48                                       |
| VM 250/100/50   | 2.500                   | 310                      | 345         | 395          | 97                      | 60                                       |
| VM 300/100/50   | 3.000                   | 330                      | 375         | 425          | 98                      | 68                                       |
| VM 350/100/50   | 3.500                   | 355                      | 395         | 445          | 97                      | 76                                       |
| VM 400/100/50   | 4.000                   | 380                      | 415         | 465          | 105                     | 90                                       |
| VM 450/100/50   | 4.500                   | 405                      | 435         | 485          | 104                     | 99                                       |
| VM 500/100/50   | 5.000                   | 425                      | 455         | 505          | 104                     | 108                                      |
| VM 600/100/50   | 6.000                   | 465                      | 490         | 540          | 108                     | 129                                      |
| VM 700/100/50   | 7.000                   | 505                      | 520         | 570          | 117                     | 165                                      |
| VM 800/100/50   | 8.000                   | 540                      | 565         | 615          | 116                     | 185                                      |
| VM 900/100/50   | 9.000                   | 570                      | 585         | 635          | 121                     | 210                                      |
| VM 1000/100/50  | 10.000                  | 600                      | 615         | 665          | 125                     | 237                                      |
| VM 1100/100/50  | 11.000                  | 630                      | 640         | 690          | 129                     | 265                                      |
| VM 1200/100/50  | 12.000                  | 660                      | 665         | 715          | 138                     | 316                                      |
| VM 1300/100/50  | 13.000                  | 685                      | 685         | 735          | 143                     | 350                                      |
| VM 1400/100/50  | 14.000                  | 710                      | 710         | 760          | 147                     | 380                                      |
| VM 1500/100/50  | 15.000                  | 735                      | 730         | 780          | 157                     | 436                                      |
| VM 1600/100/50  | 16.000                  | 760                      | 750         | 800          | 152                     | 438                                      |
| VM 1700/100/50  | 17.000                  | 780                      | 770         | 820          | 155                     | 474                                      |
| VM 1800/100/50  | 18.000                  | 805                      | 790         | 840          | 160                     | 514                                      |
| VM 1900/100/50  | 19.000                  | 825                      | 810         | 860          | 170                     | 576                                      |
| VM 2000/100/50  | 20.000                  | 850                      | 830         | 880          | 169                     | 602                                      |
| VM 2250/100/50  | 22.500                  | 900                      | 875         | 925          | 173                     | 678                                      |
| VM 2500/100/50  | 25.000                  | 955                      | 920         | 970          | 186                     | 823                                      |
| VM 2750/100/50  | 27.500                  | 1.000                    | 970         | 1.020        | 191                     | 912                                      |
| VM 3000/100/50  | 30.000                  | 1.040                    | 995         | 1.045        | 198                     | 1.022                                    |
| VM 3250/100/50  | 32.500                  | 1.085                    | 1.035       | 1.085        | 212                     | 1.206                                    |
| VM 3500/100/50  | 35.000                  | 1.125                    | 1.080       | 1.130        | 211                     | 1.284                                    |
| VM 3750/100/50  | 37.500                  | 1.165                    | 1.115       | 1.165        | 215                     | 1.387                                    |
| VM 4000/100/50  | 40.000                  | 1.210                    | 1.150       | 1.200        | 225                     | 1.562                                    |
| VM 4500/100/50  | 45.000                  | 1.280                    | 1.210       | 1.260        | 239                     | 1.869                                    |
| VM 5000/100/50  | 50.000                  | 1.355                    | 1.270       | 1.320        | 248                     | 2.157                                    |
| VM 5500/100/50  | 55.000                  | 1.425                    | 1.330       | 1.380        | 252                     | 2.409                                    |
| VM 6000/100/50  | 60.000                  | 1.485                    | 1.385       | 1.435        | 261                     | 2.711                                    |
| VM 6500/100/50  | 65.000                  | 1.545                    | 1.445       | 1.495        | 269                     | 3.007                                    |
| VM 7000/100/50  | 70.000                  | 1.605                    | 1.485       | 1.535        | 278                     | 3.339                                    |
| VM 7500/100/50  | 75.000                  | 1.660                    | 1.545       | 1.595        | 277                     | 3.538                                    |
| VM 8000/100/50  | 80.000                  | 1.730                    | 1.605       | 1.655        | 285                     | 3.933                                    |
| VM 9000/100/50  | 90.000                  | 1.825                    | 1.685       | 1.735        | 304                     | 4.669                                    |
| VM 10000/100/50 | 100.000                 | 1.935                    | 1.760       | 1.810        | 321                     | 5.533                                    |

# SPECIAL VASOFLON® BEARINGS

To meet particular functional requirements, **FIP Industriale** also manufactures **Vasoflon®** bearings integrated with special elements and/or specially shaped. The main types are listed below. For further information see **FIP Industriale's** website.

## ANTI-LIFTING VASOFLON®

Also known as “negative load” or “double-acting” bearings. These devices are capable of resisting also vertical traction loads, commonly called “uplift forces”.



## VASOFLON® LOAD MEASURING BEARINGS

They permit *in situ* measuring of vertical loads acting on the bearings. Depending on the technology used, measurements can be read on the bearing itself or at a remote location at any time during the service life of the bearing.



## VASOFLON® WITH DAMPERS

They combine a free sliding or guided sliding Vasoflon bearing and steel hysteretic (VEL, VEP) and/or fluid viscous (VOP, VOTP, VELOP, VELOTP) dampers into a single device. They are also called “flat surface sliders with dampers”.



## VASOFLON® WITH SHOCK TRANSMITTERS (VOT)

Sliding bearings coupled with shock-transmitters (also called lock-up devices). In case of sudden movements, such as seismic shocks, the shock transmitters prevent the relative movement of the bearing elements they connect, and thus temporarily transform the bearings from sliding into fixed in the direction desired.



## VASOFLON® ELASTIC REACTION BEARINGS

They are fixed or guided sliding bearings, in which an elastomeric ring is placed between the outer circumference of the intermediate element and the pot wall, to reduce the horizontal stiffness of the bearing.

## VASOFLON® FOR INCREMENTALLY LAUNCHED BRIDGES

Their design allows for the sliding of the bridge deck during launching operation by means of a supplementary special stainless steel sheet fixed to the specially shaped upper side of the bearing, which can be removed after launching completion.



## TEMPORARILY FIXED VASOFLON®

Sliding bearings with additional temporary restraints that permit them to be fixed in a first phase, e.g. during casting or launching of bridge decks, and subsequently become sliding after the removal of the temporary blocks.

## TEMPORARILY SLIDING VASOFLON®

These bearings are initially free sliding, e.g. so as not to oppose displacements generated during the construction phase, and subsequently fixed or guided sliding after the addition of supplementary restraints or guides.



**BRIDGE  
BEARINGS**



**ANTI-SEISMIC  
DEVICES**



**EXPANSION  
JOINTS**



**FITTINGS  
FOR TUNNEL**



**NOISE  
BARRIERS**



**DAMPING  
SYSTEMS**



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