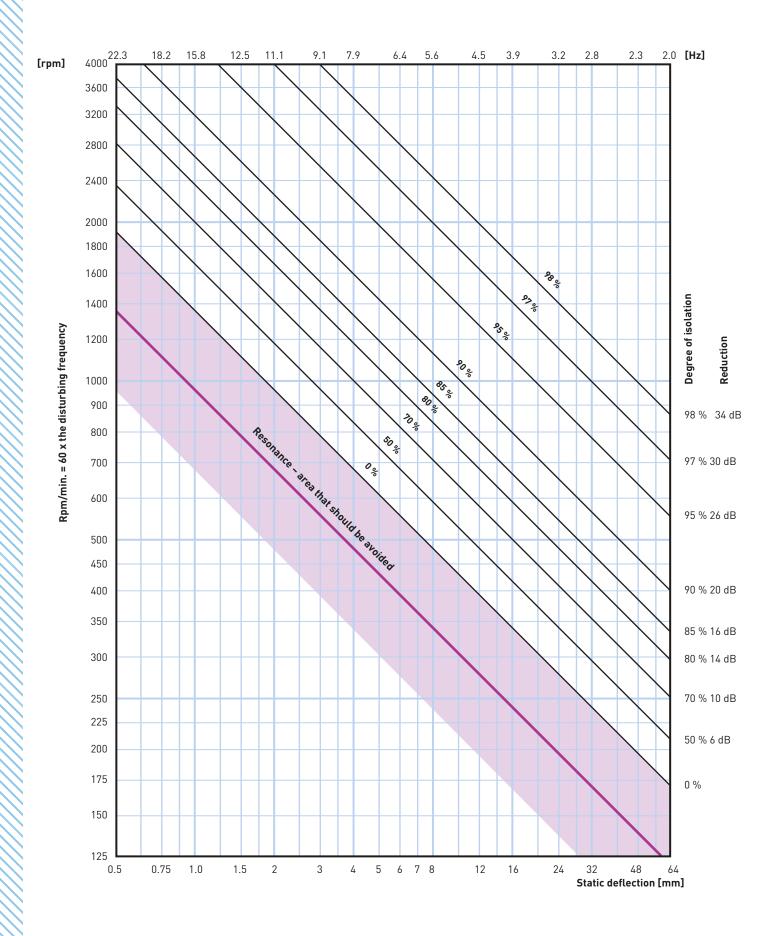


# Determination of deflection and the degree of isolation



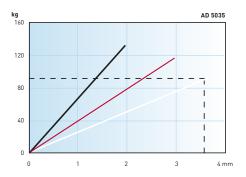
### Calculation examples

### Example 1

A fan is mounted on a frame with a total weight of 360 kg. The fan's speed is 1400 rpm, and the desired degree of isolation is  $85\,\%$ .

As shown in the diagram, this requires a static deflection of  $3.5\,\mathrm{mm}$ . So in this case, an anti-vibration mount type AD is a suitable isolator. When the fan is placed on four anti-vibration mounts, the mount will provide  $3.5\,\mathrm{mm}$  of deflection at 90 kg. This indicates that the anti-vibration mount type AD 5035 White can be used.

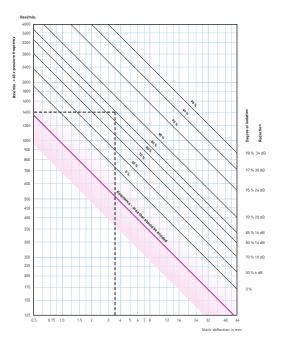
### Example 2

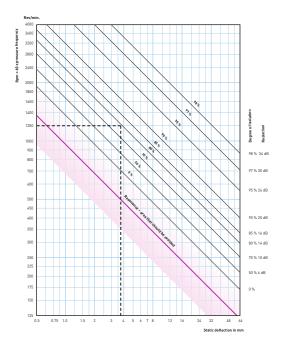


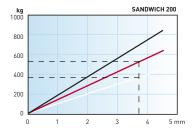
A motor of 640 kg, 2800 rpm powers a machine (2210 kg, 1200 rpm). The goal is to reduce the transmitted force to 20 % of the applied force. The motor and machine are mounted on a base frame with a mass of 1,680 kg, which means that the system has a total mass of 4530 kg.

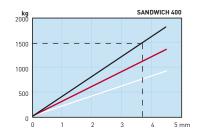
The base frame has four supporting points, and it has been calculated that the stresses at each point are 350 kg, 520 kg, 2200 kg and 1460 kg.

As can be seen in the diagram, an 80 % degree of isolation (corresponding to 20 % of transmitted force) at 1200 rpm (dimensioning according to the unit with the lowest rpm) requires a deflection of 3.7 mm. As the load is unevenly distributed, different anti-vibration mounts must be used. As can be seen in the curves about VIKAS sandwich mounts, 200 white, 200 red, 500 red and 400 black can be used.











# **NOTES**



# **VIBRATION MOUNTS - PAGE 17**

# Cylindrical anti-vibration mounts -







Pages 20 - 33 -

ADSL/RADSL



SDH



SDRV

### Rubber and PUR buffers



РΒ



GB



GBC



GBB



Pages 34 – 44



GBKS



GBF



GBR



GBK



GBT



GBTM

### Machine feet -



NF/NFR



ADF/ADM/ADP



MSL

# Pages 45 - 47 -

# **VIBRATION MOUNTS** [CONTINUED]

# Cone and sandwich mounts, etc.

Pages 48 - 60 -







FAV







ВА



VIKASH



VIKAS 100-700/HMA

DUA

**Captive mounts** 



CFM



SCM





GS1

СМН



VS/VM/VB/VX



SCH



Pages 61 - 81



BRB/BRBX



VS/VM AISI 316



SCB



CML



 $\mathsf{CMA}$ 



RP



BSB



СНМ



GS



# **VIBRATION MOUNTS** [CONTINUED]

### Flexible bushes -









Conical mounts -

Pages 85 - 91 -







Pages 92 - 111



















FD052



**FDHH** 

FDA-316



FDA1

FDA1-316

FDA2-9



FDH1-4

FDS1-4

Ceiling hangers and wall mounts -

Pages 112 - 118











VTOE-VTN





CH1

CHSR

RAHBEK

# **VIBRATION MOUNTS** [CONTINUED]

# Anti-vibration plates -

Pages 119 - 120 -





RG8/RG10

### **SHOCK MOUNTS - PAGE 122**

Pages 122 - 123 -











HELICAL

X-MOUNT

POLYCAL

PD-MOUNT

BF

Pages 126 - 129 -

# FLOOR PADS, WALL MOUNTS AND CEILING HANGERS - PAGE 125

Floor pads -







JACK-UP MOUNT

VIKAFOAM

Wall mount -







RR



۷B

Ceiling hangers



LOH



CHCE



CHCS



- Pages 133 - 135

- Pages 130 - 133

### **VIBRATION-DAMPING SHEETS - PAGE 139**

— Pages 140 - 185 -







# **SOUNDPROOFING AND DAMPING SHEETS - PAGE 189**



Sound absorbers -



IKALON 135 ALU/MK



IKALON MF-MK



IKALON PROFILE/MK



— Pages 190 – 197 -

LA SE



IKALON 135 MK

LA V2



**PYRAMID** 



LABYRINTH

# Vibration-damping sheets and other materials ———— Pages 198 – 205





**AVP** 



MX5



**IKANET** 



AVF



BM



LD13



D1D



MPM



DC NOBELL V1

# Soundproof materials —





BMJ



SMTG

— Pages 206 – 208 –

# Possible applications

	al mount	wich	oration le foot	mount	Spring mount	mount	buffer	ves	Dev	ice mo	unts	Miscellane- ous mounts	damping tes
Fields of application	Cylindrical mount	Sandwich	Anti-vibration machine foot	Captive mount	Spring	Shock mount	Rubber buffer	Sleeves	ВСН	FAV	Rabek	Hangers	Vibration-damping plates
Fixture	Х									Х	Х	Х	
Buildings							Х					Х	Х
Electric motors	Х		Х	Х		Х			Х				
Combustion engines				Х		Х							
Generators	Х			Х		Х							
Domestic appliances									Х	Х	Х		
Office machines	Х								Х	Х	Х		
Compressors	Х	Х	Х	Х	Х	Х							
Grinders		Х		Х	Х								Х
Cooling equipment	Х	Х	Х	Х	Х	Х			Х	Х	Х		
Linkages							Х	Х					
Mobile constructions		Х		Х		Х	Х	Х					Х
Sheet metal cutter			Х	Х									Х
Presses			Х	Х		Х							Х
Pumps	Х	Х	Х	Х	Х	Х			Х				
Pipe systems		Х				Х							
Punches			Х	Х		Х							Х
Printing machines			Х	Х		Х							
Woodwork	Х		Х	Х									
Rolling mills		Х											Х
Pipe systems for heating				Х								Х	
Fans	Х	Х	Х	Х	Х				Х	Х			Х
Machine tools	Х	Х	Х	Х								Х	Х

The diagram is for information purposes only.



### Vibrations and vibration damping

#### Introduction

The requirements for quiet machines and their surroundings continue to become stricter, but a large number of noise and vibration problems in industrial facilities, offices, homes, vehicles, etc. can be remedied by using anti-vibration mounts

Unbalanced machinery generates vibrations which are transferred to the underlay and from there further propagate as noise (structure noise).

The purpose of vibration isolation is to reduce vibrations transmitted from the machine to the underlay. A corrctly sized anti-vibration mount can reduce vibrations by more than 90 %, but never by 100 %. (90 % isolation means that only 10 % of the vibratory force is transferred).

A machine set up on anti-vibration mounts constitutes an oscillating system with at least one natural frequency. If the disturbing frequency (e.g. the machine's rpm) falls with the natural frequency, vibrations are amplified.

The best isolation is achieved when the disturbing frequency is considerably higher than the natural frequency.

Most machines are difficult to counterbalance completely, and imbalances can, for example, be solved through vibration isolation.

When a number of assumptions are made about the oscillating system, the dimensioning procedure is relatively simple.

### Types of rubber

Rubber is produced in a variety of types which have specific properties.

IACs own brand of anti-vibration mounts are normally made from one of the types of rubber shown on the next page, al-though other types of rubber are available:

### **Material properties**

#### Hardness

Rubber Quality	Rubber Colour	Hardness Sh(A)				
Soft	White	45 ± 5				
Medium	Red	55 ± 5				
Hard	Black	65 ± 5				

In order to best utilise the rubber's properties, IAC own brand of anti-vibration mounts are made in different hardnesses.

Since the rubber cannot be compressed, spring action can only be achieved when the rubber is under a load and can "bulge" out.

The deflection of the rubber is determined by its size, shape and hardness. The hardness of the rubber indicates its resistance to deformation under pressure. Rubber can withstand large compressive loads with a deflection of approximately 20 % of the unloaded height.

Cross-load, or "shear" can normally take up to 20 % of the pressure load. The rubber should ideally not be subjected to tensile loads, as these significantly reduce the rubber's service life.



# Rubber qualities

Type>	Natural rub- ber (NR) *	Chloroprene CR (Neoprene)	Nitrile rub- ber (NBR)	EPDM rubber	Silicone (MVQ/SI)	Polyurethane (PUR)
Properties	Nat be	S CFI	N Sit	EPD	υ <u>ς</u>	Poty
Temperature range	-40-+80 °C	-30-+120 °C	-40-+140 °C	-40-+150 °C	-70-+180 °C	-30-+80 °C
Short-term max. temperature	100 °C	150 °C	160 °C	180 °C	225 °C	100 °C
Tensile strength	25 N/mm²	25 N/mm²	25 N/mm²	20 N/mm²	8 N/mm²	30 N/mm²
Tensile elongation %	800 %	450 %	500 %	450 %	250 %	500 %
Elongation/tensile strength	5	3	3	3	1	5
Wear resistance	3	3	4	3	2	5
Resistant to tearing	4	4	4	3	1	5
Bending ability	3	4	2	4	1	
Flexibility	5	3	5	3	3	3
Damping						
UV-resistance	1	4	1	5	5	3
Resistant to oxidation	2	3	2	5	4	3
Resistant to ozone	2	4	2	5	5	3
Climate impact	3	4	2	5	5	5
Lye*	3	4	3	5	X	X
Petrol*	Х	2	5	Х	Х	4
Benzene*	Х	1	Х	Х	Х	Х
Oil*	Х	3	5	1	3	4
Acid*	Conditional	3	Conditional	4	Conditional	Conditional
Water*	4	4	3	4	3	4

<sup>\*</sup>The condition is that they are immersed in the liquid; if the impact is short-lived nothing will happen to the rubber

Х	Not suitable
	Not tested
1	Bad
2	Moderate
3	Good
4	Very good
5	Excellent



### Dimensioning rules

### **Prerequisites**

The information contained in the following design procedure is a practical and useful tool, but is not complete. However, it is sufficient for use in the vast majority of designs, when:

- anti-vibration mounts are significantly softer than the underlay and the machine base.
- the vibratory force passes approximately through the centre of gravity.
- the distance between the anti-vibration mounts is greater than the vertical distance between the plane of the anti-vibration mount and the centre of gravity.
- the dimensioning does not readily take place at a degree of isolation lower than 70 %.

A low rpm requires a very large deflection to achieve high isolation, but as a large deflection may produce an unstable setup, hard VIKAS anti-vibration mounts are often chosen, as the resonance frequency becomes higher than the disturbing frequency. This provides no isolation of the fundamental frequency but dampens shock and high frequency vibrations, which are often the troublesome parts.

#### **Foundations**

If the machinery is made up of multiple devices, these should be mounted on a common base frame, after which the anti-vibration mounts are placed between the frame and the underlay. If each device has a different rpm, isolation must be done according to the lowest RPM.

A heavy base frame which significantly increases the weight of the machine acts to stabilise the setup. If the vibratory force is large and/or the RPM is low, an additional mass of the following size is recommended (m is the machine's mass in kg):

RPM	Weight of additional mass (kg)
<800	1.5–2.0 x m
800–1200	1.0−1.5 x m
>1200	0.0–1.0 x m

### The underlay

A seemingly correct vibration isolation can fail if the underlay does not have sufficient mass and stiffness. The following table shows guiding values for the amount of machine mass that can be set up on a concrete deck of a given thickness. If the deck rests directly on the ground, twice the mass can be allowed.

Thickness of concrete (mm)	Max. permissible machine mass (kg)
150	1000
200	2000
300	5000
400	8000
600	10000

### Impact forces

When selecting anti-vibration mounts for mobile equipment, the dimensioning must take into account shocks – i.e., the anti-vibration mounts must, in addition to the machine's mass and vibration forces, be able to absorb impact forces. It is recommended that you count on additional shock of 50–100 %. Furthermore, it is recommended to use an anti-vibration mount with a stop device or a custom design, such as the captive mounts.

#### Flexible connectors

When a machine is mounted on anti-vibration mounts, it must be ensured that the vibrations are not transferred via other rigid connections. Flexible connecting links (e.g. rubber hoses or compensators) are inserted in pipelines. Cables must be bendable and flexible couplings must be used for shaft connections.

#### Location of anti-vibration mounts

Ideally, the anti-vibration mounts should be placed symmetrically around, and on the same plane as, the centre of gravity.

If the load on the anti-vibration mounts is not equal, use different anti-vibration mounts so that the deflection is the same on all the mounts.

In practical terms it may be difficult to position the antivibration mounts on the same horizontal plane as the centre of gravity. If this is the case, the distance between the anti-vibration mounts should be greater than the vertical distance between the plane of the anti-vibration mounts and the centre of gravity.



### Technical and practical

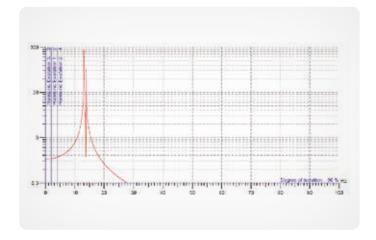
#### Calculation

The calculation of the vibration isolation can sometimes be more complicated than in normal cases, when you can quickly find the right product or solution.

IAC Nordic has skills and tools that we use when a simple selection of anti-vibration mounts is not enough. When required, we can assist with what we call "vibration engineering", which covers:

- Development of customs products.
- Advanced calculations in 6DoF.
- · Control by means of vibration meters.
- The installation of anti-vibration mounts and projects focusing on damping structure-borne noise. Complete process incl. assembly by our experienced fitters.
- · Problem-solving for existing constructions.

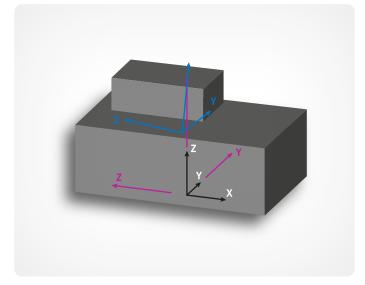
An increased focus on sound comfort in homes which are, for example, located close to transport systems, has meant increasing activity in vibration isolation in new buildings.



For this, we use VIKAFOAM, which is available in sheet sizes up to  $500 \ \text{X} \ 2000 \ \text{mm}.$ 

It is possible to set up entire buildings, the load-bearing structures or just individual building elements on VIKAFOAM. The material is often used under floating floors, stairs, driving ramps and below foundations which are cast to give oscillation systems additional mass.









### Technical and practical

We can perform virtually all kinds of dimensioning of oscillation isolation.

In recent years, IAC has seen growing interest in the major custom projects, particularly within the isolation of large foundations.

To the right we have chosen to show some examples of the special types of task that we are involved in. They range from floating platforms for box in box systems to vibration isolation of heavy foundations (typically 20–500 tonnes) to advanced mount constructions with viscous damping.

The isolation of concrete foundations can be done by placing PUR sheets over the whole floor area, or as point supports. In solutions where the entire area is covered by PUR sheets, the concrete can be cast directly onto the PUR sheets.





### Assembly example 1

Vibration isolation using PUR sheets in a carpettype design, of box in box constructed semi-anechoic chamber.

IAC delivery of a semianechoic chamber with a high dynamic loading of the concrete deck from 24t forklift.



#### IAC delivery:

- Calculation of the natural frequency of the system
- Dimensioning of the concrete deck with a stress analysis
- Delivery and assembly

### Assembly example 2

Subsequent mounting of spring mounts for district heating pumps when rubber mounts, installed by others, did not provide enough vibration isolation.



- Calculation of natural frequencies
- Design of vibration isolation
- Delivery and assembly





### Assembly example 3

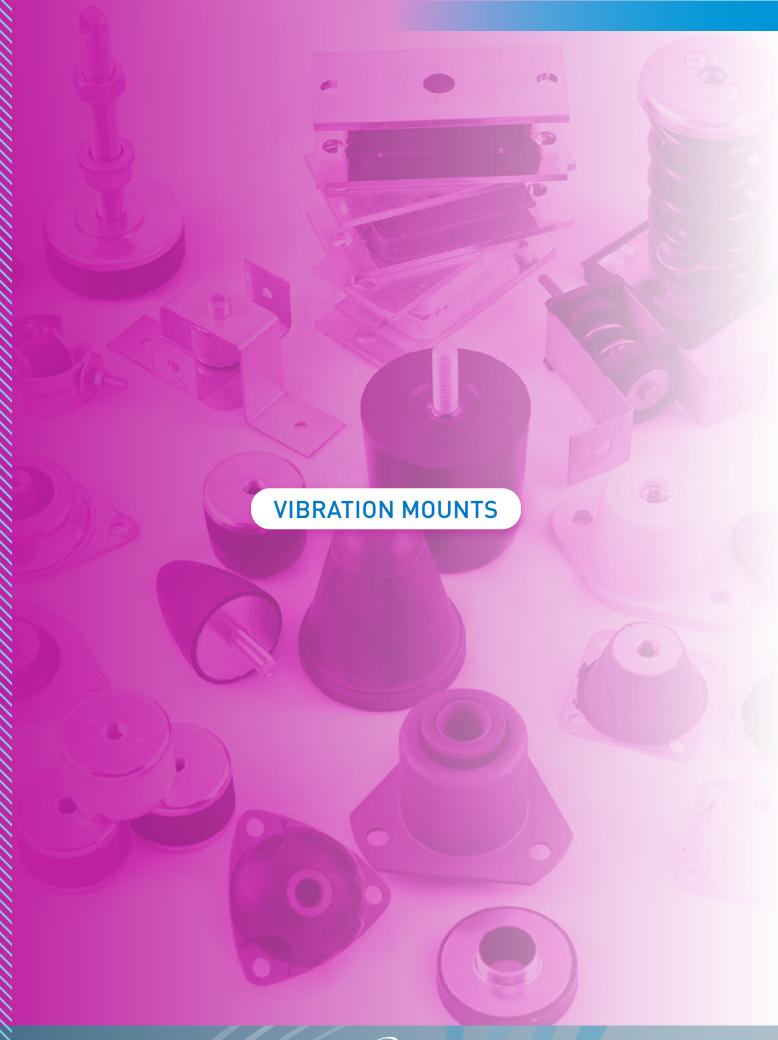
Subsequent mounting of spring mounts to refrigeration equipment where rubber mounts, installed by others, did not provide enough vibration isolation.

#### IAC delivery

- Calculation of natural frequencies
- Design of vibration isolation
- Delivery and assembly







# Contents

# Cylindrical anti-vibration mounts —



AD/RAD



ADSL



SD



SDW



Pages 20 - 33 -

SDS

# Rubber and PUR buffers



SDH

РΒ



SDRV

GB



GBC



GBB



Pages 34 – 44

GBS



GBKS



GBF



GBR



GBK



GBT



GBTM

# Machine feet



NF/NFR



ADF/ADM/ADP



Pages 45 – 47

# Cone and Sandwich mounts, etc. ——



FΑ



DU





FAV



ВА





HYDRO-MOUNT



Pages 48 - 60 -



VIKASH

# Captive mounts

VIKAS 100-700/HMA



CFM

SCM



GMS



СМН



VS/VM/VB/VX



SCH

GS2



BRB/BRBX



VS/VM AISI 316



SCB



CML



СМА







BSB



СНМ



GS

# Flexible bushings



GS1

VPP



— Pages 82 – 84 –

# **Contents**

### Conical mounts -





Pages 85 - 91 -

Spring mounts



FDHL



FDHH



ES



FD040



Pages 92 - 111 -

FD074



FD052



FDA



FDA-316



FDA1



FDA1-316



FDA2-FDA9



FDR2-4



FDH1-4



FDS1-4

# Ceiling hangers and wall mounts —————



VTOE-VTN



CH2



CH1



CHH1

Pages 119 – 120



Pages 112 - 118 -

CHSR



CHJ



Anti-vibration plates —









# **VIKAS** anti-vibration mounts

### **Product description**

Cylindrical mounts made from NR/SBR, which is vulcanised to two galvanised steel disks with a threaded hole. The mount comes in three rubber hardnesses and the colour of the rubber indicates the hardness.

Rubber Colour	Hardness Sh(A)	Comment
White	45 ± 5	As per FDA specifications
Red	55 ± 5	As per FDA specifications
Black	65 ± 5	

The mount is also made from stainless steel (AISI 316) with the designation RAD. Can also be made in neoprene rubber for use in oil-containing environments.

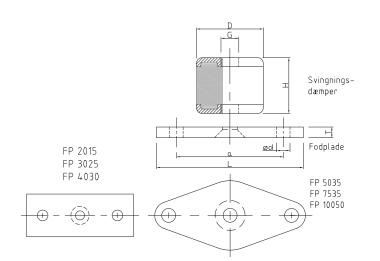
### **Application**

The Cylindrical mounts are used for damping noise and vibrations, which come from stationary machine installations, such as fans, pumps, electric motors, converters and compressors.

Type AD is preferably used for the isolation of machinery which has a rotational speed greater than 1200 rpm and is designed for compressive loads, but can withstand minor shear forces. Type RAD (stainless AD) is used in special environments, such as in the food industry.

#### **Accessories**

Base plate in galvanised steel for mounting on floors etc., not available in stainless steel. Comes with a countersunk screw.

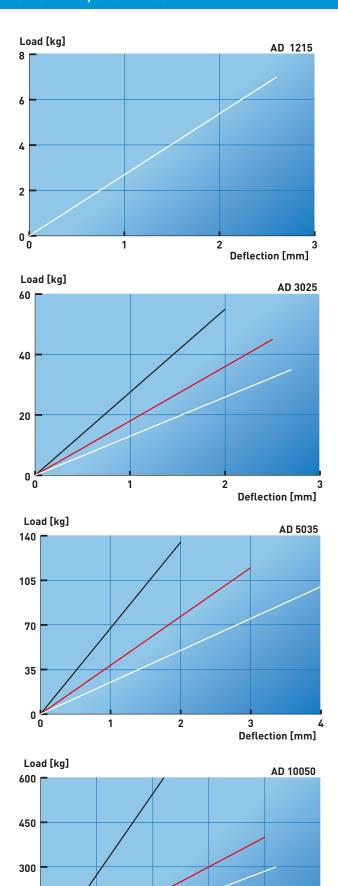


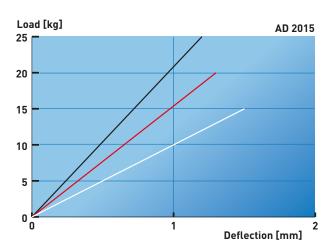
### **ALSO AVAILABLE IN STAINLESS**

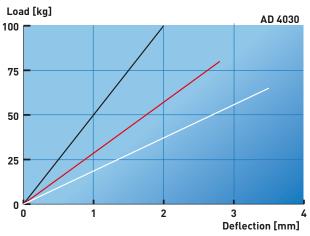
Туре	Hardness Rubber colour	Load	Static deflection		-vibration (		Mount weight	Base plate dimension [mm]					
	Rubber colour	[kg]	[mm]	D	Н	G	[g]	L	Width	Т	ød		
AD 1215	White	7	2.6	12	15	М3	5	-	-	-	-	-	
	White	15	1.5										
AD 2015	Red	20	1.3	20	15	M6	15	60	20	4	7.5	40	
	Black	25	1.2										
	White	35	2.7			M8		90					
AD 3025	Red	45	2.5	30	25		50		30	6	10	60	
	Black	55	2.0										
	White	65	3.5		40 30						10		
AD 4030	Red	80	2.8	40		M8	90	100	40	6		70	
	Black	100	2.0										
	White	100	4.0				170	100			10		
AD 5035	Red	115	3.0	50	35	M10			45	8		80	
	Black	135	2.0										
	White	225	2.8										
AD 7535	Red	300	2.7	75	35	M12	370	145	65	8	13	115	
	Black	400	2.2										
	White	300	4.2										
AD 10050	Red	400	4.0	100	50	M12	800	170	90	8	13	145	
	Black	600	2.2										

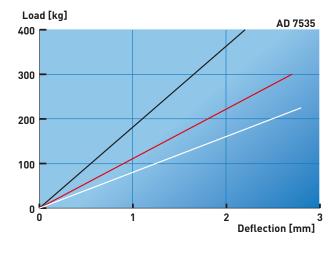
stanti-vibration mounts are available in electro-galvanised and stainless-steel AISI 316.











2

3

4 Deflection [mm]

150

0

### VIKAS waisted mounts

### **Product description**

Waisted cylindrical anti-vibration mount which can be tuned to a specific natural frequency. Manufactured according to customer needs.

By grinding the diameter smaller in the centre "waist", the mount's stiffness can be controlled very accurately. During production, the grinding depth is tested in order to ensure that the stiffness is maintained for each item.

The mount is the same type as our AD/RAD mount, and all types of AD/RAD can be made with a waist.

### **Application**

Anti-vibration mounts with a waist are used for, among other things, equipment mounted on machines/motors with high amplitude vibrations of known frequency ranges. This can also be passive isolation of electrical installations on the motors or vibrators, and active isolation of stationary machine installations such as fans, pumps, electric motors, converters and compressors in sound-susceptible areas.

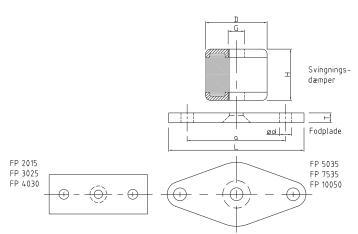
Also used in special environments such as in the food industry.

#### Accessories

Base plate in galvanised steel for mounting on floors etc., Countersunk screw included. Baseplate is not available in stainless steel.

### **ALSO AVAILABLE IN STAINLESS**





Туре	Hardness Rubber colour	Load	Static deflection		-vibration ( nension [m		Base plate dimension [mm]					
	Rubbei Cotoui	[kg]	[mm]	D	Н		L	Width	Т	ød		
	White	1–15										
ADSL 2015	Red	1.5-20		20	15	M6	60	20	4	7.5	40	
	Black	2-25										
	White	3–35					90					
ADSL 3025	Red	4-45	, ts	30	25	M8		30	6	10	60	
	Black	5-55	wai									
ADSL 4030	White	10-65	the							10		
	Red	15-80	Depending on the depth of the waist	40	30	М8	100	40	6		70	
	Black	20-100										
	White	20-100	the						8	10		
ADSL 5035	Red	25-115	uo fi	50	35	M10	100	45			80	
	Black	30-135	ding									
	White	50-225	bec									
ADSL 7535	Red	60-300	ă	75	35	M12	145	65	8	13	115	
	Black	80-400										
	White	100-300										
ADSL 10050	Red	125-400		100	50	M12	170	90	8	13	145	
	Black	150-600										

### Cylindrical anti-vibration mounts

### **Product description**

Cylindrical anti-vibration mounts where the rubber is vulcanised on a galvanised steel washer(s).

Available in different hardnesses and many kinds of thread, rubber type and colour and in different steels; see the list below.

### **Application**

The anti-vibration mounts are used for damping noise and vibrations from stationary machine installations such as fans, pumps, electric motors, converters, compressors, heat pumps and many others.

### The following options are offered on SD mounts

#### Standard version of the SD mount is:

- Natural rubber (NR) hardness 45, 55 or 65 Sh(A)
- Electro-galvanised surface Fe/Zn12/1A

#### Can also be ordered as follows:

- NR hardness 30–35 or 20–30 Sh(A)
- Rubber type CR, NBR, EPDM & silicone
- The rubber is available in grey, as well as other colours
- Steel AISI 304 or 316
- Embossing of letters or numbers on the steel part
- Colour labelling of the rubber or steel part

### Deeper threads:

- M5 max. 14 mm open threaded hole
- M6 max. 14 mm closed threaded hole
- M8 max. 16 mm closed threaded hole
- M10 max. 20 mm closed threaded hole
   M12 max. 24 mm closed threaded hole



### The following thread lengths are offered:

Thread/Length [mm]	6	8	10	12	15	17	18	20	22	23	25	27	28	33	36	37	38	41	46	47
М3	Х	Х	А	А	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
M4	Х	Х	Х	Х	Х	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M5	А	Х	Х	Х	Х	-	Α	Х	-	-	-	-	-	-	-	-	-	-	-	-
M6	А	Х	Х	Х	Х	-	Х	Х	-	Х	А	-	Х	А	А	А	А	-	-	А
M8	-	А	Х	Х	Х	-	Х	Х	-	Х	А	-	Х	Х	А	А	А	-	-	А
M10	-	А	Х	Х	Х	-	Х	Х	-	Х	Х	-	Х	Х	-	-	Х	-	-	А
M12	-	-	Х	А	-	Х	-	-	Х	-	-	Х	-	-	-	Х	-	А	-	Х
M16	-	-	-	-	-	-	-	-	Α	-	-	Х	-	-	Х	-	-	Х	Х	-
M20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Х	Х	-

X: Standard lengths

0: On request

# Max. load/Deflection

B: .		Static	Data app	lies to all 5 ty	pes of SD
Diameter [mm]	Height [mm]	deflection [mm]	45 Sh(A)	55 Sh(A)	65 Sh(A)
6	7	1.4	[kg]	[kg] 2.9	[kg] 4.1
6	8	1.6	1.8	2.8	4.0
-					
6	10	2.1	1.6	2.5	3.7
6	13	2.7	1.5	2.3	3.5
8	5	0.8	3.7	5.3	7.6
8	8	1.6	3.6	5.3	7.7
8	10	2.0	3.2	4.9	7.1
8	13	2.6	2.9	4.5	6.5
8	15	3.0	2.8	4.3	6.3
9	12	2.5	4.0	6.0	8.8
10	6	1.0	5.8	8.4	11.9
10	8	1.4	5.5	8.2	11.8
10	10	2.0	5.5	8.3	12.0
10	15	3.0	4.6	7.1	10.5
10	17	3.4	4.4	6.9	10.1
10	18	3.7	4.4	6.8	10.0
10	20	4.0	4.2	6.6	9.8
10	30	6.1	3.9	6.1	9.1
11	11	2.2	6.7	10.0	14.6
12	10	1.8	8.0	11.7	17.0
13	26	5.3	7.1	11.2	16.5
15	4	0.5	25	30	36
15	5	0.7	20	25	34
15	6	0.8	17	22	31
15	7	1.0	15	20	29
15	8	1.2	14	19	28
15	9	1.4	13	19	27
15	10	1.7	13	18	27
15	12	2.2	12	18	27
15	13	2.4	12	18	27
15	15	3.0	12	19	27
15	20	4.0	11	17	24
15	25	5.0	10	16	23
15	30	6.1	9.5	15	22
16	18	3.6	13	20	29
18	6	0.8	28	36	50
18	8	1.2	22	30	42
18	10	1.6	19	27	39
18	13	2.2	18	26	38
18	15	2.8	18	26	38
20	5	0.6	48	57	64
20	8	1.1	30	39	55
20	10	1.5	25	35	50
20	11	1.7	24	34	49
20	12	1.9	23	33	48
20	13	2.1	23	33	47
20	15	2.6	22	33	47
20	17	3.2	22	33	47

		Static	Data app	lies to all 5 ty	pes of SD
Diameter [mm]	Height [mm]	deflection [mm]	45 Sh(A) [kg]	55 Sh(A) [kg]	65 Sh(A) [kg]
20	20	4.0	22	33	48
20	23	4.6	20	31	45
20	25	5.0	20	30	44
20	30	6.0	18	28	42
25	8	1.1	57	72	98
25	10	1.4	46	61	86
25	12	1.8	40	55	79
25	13	2.0	38	54	77
25	14	2.2	37	53	75
25	15	2.4	36	52	75
25	17	2.9	35	51	74
25	18	3.1	35	51	73
25	19	3.4	35	51	73
25	20	3.6	34	51	73
25	22	4.1	34	51	74
25	25	5.0	34	52	75
25	27	5.4	33	50	73
25	28	5.6	32	49	72
25	30	6.0	31	48	70
26	22	4.1	37	55	80
30	8	1.0	100	120	144
30	10	1.3	79	100	138
30	12	1.7	66	88	124
30	13	1.9	62	84	119
30	15	2.3	56	78	112
30	17	2.7	53	76	108
30	18	2.9	52	75	107
30	20	3.3	51	74	106
30	22	3.8	50	73	106
30	25	4.6	49	73	106
30	30	6.0	49	74	108
30	35	7.0	46	70	102
30	45	9.0	41	64	94
30	40	8.0	43	66	97
40	10	1.3	191	227	256
40	15	2.1	125	164	228
40	20	3.0	99	139	198
40	25	4.1	92	132	190
40	27	4.5	90	131	188
40	28	4.8	90	131	188
40	30	5.3	89	130	188
40	35	6.6	88	130	189
40	38	7.4	88	131	191
40	40	8.0	88	132	192
40	45	9.0	83	126	183
40	50	10.0	79	121	176
50	15	2.0	243	302	400
50	17	2.3	214	274	377

# SDA/SDB/SDC/SDD/SDE

			Data applies to all 5 types of SD		
Diameter	Height	Static deflection	45 Sh(A)	55 Sh(A)	65 Sh(A)
[mm]	[mm]	[mm]	[kg]	[kg]	[kg]
50	20	2.8	184	246	343
50	21	3.0	177	239	335
50	25	3.8	154	217	310
50	27	4.2	150	213	304
50	28	4.4	148	211	302
50	30	4.8	145	208	298
50	35	6.0	140	204	294
50	37	6.4	139	203	293
50	40	7.2	138	203	294
50	42	7.7	137	203	294
50	45	8.6	137	204	296
50	50	10.0	137	206	300
50	60	12.0	125	192	280
50	80	16.0	112	174	256
60	15	1.9	430	511	576
60	16	2.0	399	481	576
60	20	2.7	314	401	551
60	25	3.5	256	345	484
60	30	4.5	222	313	447
60	35	5.5	210	301	431
60	40	6.7	203	295	424
60	45	7.9	199	293	422
60	50	9.2	198	293	424
60	60	12.0	197	297	432
65	35	5.4	253	360	514
70	20	2.6	502	617	785
70	25	3.4	400	519	717
70	30	4.3	341	462	649
70	35	5.3	302	426	608
70	40	6.3	288	412	589
70	45	7.4	279	403	579
70	50	8.6	273	399	575
70	53	9.3	271	398	575
70	55	9.8	270	398	575
70	60	11.1	269	399	578
70	70	14.0	269	404	588
75	20	2.5	623	752	901
75	25	3.3	491	626	860
75	30	4.2	415	553	772
75	35	5.1	365	506	717
75	40	6.1	338	480	686
75	45	7.2	326	468	671
75	50	8.3	318	461	663
75	55	9.5	313	458	660
75	60	10.8	310	457	660
75	70	13.5	308	461	669
75	100	20.0	270	415	607
80	30	4.1	500	656	910

Diameter	Height	Static			pes of SD
[mm]	[mm]	deflection [mm]	45 Sh(A) [kg]	55 Sh(A) [kg]	65 Sh(A) [kg]
80	40	6.0	394	556	794
80	50	8.1	367	529	759
80	55	9.3	359	523	752
80	60	10.5	355	520	751
80	65	11.8	352	520	752
80	70	13.1	350	522	756
80	75	14.5	350	524	761
80	80	16.0	351	528	769
90	50	7.8	480	685	979
90	55	8.9	467	672	963
90	60	10.0	458	664	954
90	100	20.0	421	639	932
100	25	3.1	1196	1419	1601
100	30	3.9	972	1209	1601
100	35	4.7	833	1075	1482
100	40	5.6	737	983	1372
100	45	6.5	668	918	1295
100	50	7.5	616	869	1240
100	55	8.5	595	847	1211
100	60	9.6	579	832	1192
100	65	10.7	568	822	1180
100	70	11.9	560	816	1175
100	75	13.1	554	813	1173
100	80	14.4	550	813	1174
100	90	17.1	547	817	1184
100	100	20.0	548	825	1201
120	80	13.3	813	1181	1696
120	100	18.3	790	1171	1694
120	120	24.0	789	1188	1729
125	40	5.3	1421	1794	2456
125	55	7.9	1063	1452	2045
125	60	8.9	993	1386	1969
125	70	10.9	924	1318	1885
125	75	12.0	905	1300	1862
125	90	15.5	871	1273	1833
125	95	16.7	864	1270	1832
125	100	18.0	860	1270	1835
125	125	25.0	856	1290	1876
125	190	38.0	712	1106	1622
140	48	6.4	1665	2138	2943
140	60	8.6	1363	1849	2597
150	50	6.7	1964	2505	3441
150	55	7.5	1793	2341	3241
150	60	8.4	1659	2212	3087
150	75	14	1150	4070	5040
164	75	11	1775	2450	3450
200	100	18	1850	4070	8470

				ung Sun			
Diameter [mm]	Height [mm]	SDA	SDB	SDC	SDD	SDE	
6	7						
6	8	Mari	M2:1 /M2		MONT	142	
6	10	- M3xL	M3xL/M3	M3	M3xL	М3	
6	13			IMO			
8	5	_					
8	8	M3xL	M3xL/M3	M3	M3xL	M3	
8	10		,				
8	13	M3xL M4xL	M3xL/M3	M3 M4	M3xL M4xL	M3 M4	
8	15	M5xL	M4xL/M4	IVI4	M5xL	M5	
9	12	M3xL M4xL M5xL	M3xL/M3 M4xL/M4	M3 M4	M3xL M4xL M5xL	M3 M4 M5	
10	6		M3xL/M3		M3xL	M3	
10	8		M3xL/M3	M3			
10	10	_	M4xL/M4	IMO			
10	15	M3xL M4xL M5xL			M3xL	M3	
10	17		M3xL/M3	M3	M4xL M5xL	M4 M5	
10	18		M4xL/M4 M5xL/M5	M4 M5			
10	20	-					
10	30	MOST			MONT	N2	
11	11	M3xL M4xL M5xL	M3xL/M3 M4xL/M4	M3 M4	M3xL M4xL M5xL	M3 M4 M5	
12	10	M3xL M4xL M5xL	M3xL/M3 M4xL/M4	M3	M3xL M4xL M5xL	M3 M4 M5	
13	26	M4xL M5xL	M4xL/M4 M5xL/M5 M6xL/M6	M3 M4 M5	M4xL M5xL M6xL	M3 M4	
15	4				N47 ml		
15	5				M4xL		
15	6						
15	7						
15	8	_	M4xL/M4				
15	9	_		M3		MЗ	
15	10	M/vI			M/vI	M3 M4	
15	12	M4xL M5xL		M3 M4	M4xL M5xL		
15	13	-	M4xL/M4	. 1=	-		
15	15	_	M4xL/M4 M5xL/M5	M3		M3	
15 15	20 25	-		M3 M4 M5		M3 M4 M5	
15	30	-		CINI		M5	
16	18	M4xL M5xL	M4xL/M4 M5xL/M5	M3 M4 M5	M4xL M5xL	M3 M4 M5	
10	18	M5xL	M5xL/M5	M5	M5xL	M5	

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Diameter [mm]	Height [mm]	SDA	SDB	SDC	SDD	SDE	
18	6						
18	8.5						
18	10	M6xL			M6xL		
18	13		M6xL/M6	M6		M6	
18	15			1410			
20	5				M5xL		
20	8	M5xL			M6xL	M5	
20	10	M6xL M8xL	M5xL/M5 M6xL/M6		M8xL	M6	
20	11		MEVL/ME				
20	12		M5xL/M5 M6xL/M6				
20	13	-			_		
20	15	M5xL		M5 M6	M5xL/M5 M6xL/M6	M5 M6 M8	
20	17	M6xL M8xL		INIO	M6xL/M6 M8L/M8		
20	20		M5xL/M5 M6xL/M6 M8L/M8	ME			
20	23		M8L/M8	M5 M6 M8			
20	25			M8			
20	30						
25	8	M6xL					
25	10			-		M6	
25	12	-					
25	13	_					
25	14	_					
25	15	-					
25	17	_		M6	M6xL		
25 25	18	M6xL	M6xL/M6		M8xL	M6	
25	20	M8xL	M6xL/M6 M8xL/M8		-	M6 M8	
25	22	-					
25	25	-		147			
25	27	1		M6 M8			
25	28	1					
25	30	1					
26	22	M6xL M8xL	M6xL/M6 M8xL/M8	M6 M8	M6xL M8xL	M6 M8	
30	8						
30	10					M6	
30	12	M6xL	MAVI /MA				
30	13	1	M6xL/M6 M8xL/M8		M6xL M8xL	M6 M8	
30	15				M10xL		
30	17	- M6xL M8xL - M10xL	M6xL/M6 M8xL/M8 M10xL/M10	M6		M6 M8 M10	
30	18	M10xL	M10xL/M10			M10	

Diameter [mm]	M6 M8 M10 M6
30 22 30 30 30 30 30 30 30 35 35 30 45 30 30 45 30 40 10 40 15 40 20 40 25 40 25 40 40 35 40 40 40 40 40 40 40 40 40 40 40 40 40	M6
30 25 30 30 30 30 30 30 30 35 30 35 30 40 30 45 30 40 40 40 40 40 40 25 40 40 35 40 40 40 40 40 40 40 40 40 40 40 40 40	M6
30 30 30 M8xL M8xL/M8 M8xL/M8 M10xL/M10 M8xL M8xL/M8 M10xL/M10 M8xL M8xL/M8 M10xL/M10 M8xL M10xL	M6
M10xL   M10xL/M10   M8	M6
M10	M6
30	M6
Mode	M6
M6	M6
M6	M6 M8 M10
40 25 40 27 40 28 M6xL M8xL M8xL M8xL M10xL/M10  M6 M8 M10xL M6xL/M6 M8xL M8xL M10xL M6xL M8xL M10xL M6xL M8xL M10xL M8xL M10xL M10xL M8xL M10xL M10xL	M6 M8 M10
40 27 40 28 M6xL M8xL M8xL/M6 40 30 M10xL M10xL M6xL/M10 M6 M8xL M10xL	M6 M8 M10
MoxL	M6 M8 M10
Maximum	M6 M8 M10
40 35 M6 M8 M10 M10 M6 M8 M10 M10 M6 M8 M10 M10 M10 M6 M8 M10	M10
40 40 40 40 45 45 40 40 45 40 40 50 50 50 50 50 7 50 9 M8xL M10xL 50 12 50 15	
40 40 40 40 45 45 40 40 45 40 40 45 40 40 50 50 50 50 50 50 50 50 50 50 50 50 50	
40 45 40 50	
40     50       50     7       50     9       50     12       50     15	
50 7 M8xL M10xL 50 12 M8xL 50 15	
50 9 M8xL 50 12	
50 12 M8xL 50 15	
50 15	
	M8
50 17 M8xL/M8	
50 20	
50 21 M8	
50 25	
50 27 M8 M10	
50 28 M8vI	
50 26 M8xL 50 30 M8xL M10xL M10xL M10xL M12xL M12xL	M8
50 30 M8xL M10xL M10xL/M10 M10xL/M10	M8 M10 M12
50 37 M12xL/M12	IVI I Z
50 40	
50 42 M8 M10 M12	
50 45	
50 50	
50 60	
50 80	
60 15 M8xL/M8	MO
60 16 M8xL M10xL M8xL/M8 M9xL M12xL	M10
60 20 M10xL M8xL/M8 M10xL/M10 M8	M8 M10 M8 M10 M12

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Diameter [mm]	Height [mm]	SDA	SDB	SDC	SDD	SDE
60	25			M8		
60	30					
60	35	M8xL	M8xL/M8		M8xL	M8
60	40	M8xL M10xL M12xL	M8xL/M8 M10xL/M10 M12xL/M12	M8 M10	M8xL M10xL M12xL	M8 M10 M12
60	45	HITZAL	INTEXE, INTE	M12	MITERE	1112
60	50					
60	60					
65	35	M12xL	M12xL/M12	M12	M12xL	M12
70	20		M10xL/M10			
70	25					
70	30					
70	35				M10xL	
70	40	M10xL				M10 M12
70	50	M12xL	M10xL/M10 M12xL/M12	M10	M12xL	
70	53			M12		
70	55					
70	60					
70	70					
75	20		M10xL/M10			
75	25					
75	30				M10xL M12xL	
75	35					
75	40					
75	45	M10xL M12xL	M10xL/M10			M10 M12
75	50		M12xL/M12	M10 M12		
75	55					
75	60					
75	70					
75	100					
80	17					M10 M12
80	18		M10xL/M10			IVI I Z
80	30			M10		
80	40	M10√I		M10 M12 M14	M10xL	
80	50	M10xL M12xL	M10vl /M10		M12xL	M10
80	55	M14xL M16xL	M10xL/M10 M12xL/M12 M14xL/M16		M14xL M16xL	M10 M12
80	60		M14xL/M16 M16xL/M16	M10		M14 M16
80	65			M12 M14		
80	70			M16		
80	75					
80	80					

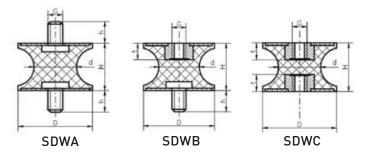
					enn lann		
Diameter [mm]	Height [mm]	SDA	SDB	SDC	SDD	SDE	
90	50						
90	55	M12xL	M12xL/M12	M12	M12xL	M12	
90	60	M16xL	M16xL/M16	M16	M16xL	M16	
90	100						
100	25						
100	30						
100	35						
100	40						
100	45						
100	50						
100	55	M12xL			M12xL	M12	
100	60	M16xL	M12xL/M12		M16xL	M16	
100	65		M16xL/M16	M12 M16			
100	70						
100	75						
100	80						
100	90						
100	100						
120	80						
120	100	M12xL M16xL	M12xL/M12 M16xL/M16	M12 M16	M12xL M16xL	M12 M16	
120	120						
125	40						
125	55						
125	60						
125	70						
125	75	M12xL	M12xL/M12	M12	M12xL	M12	
125	90	M16xL	M16xL/M16	M16	M16xL	M16	
125	95						
125	100						
125	125						
125	190						
140	48	M20xL	M20xL/M20	M20	M20xL	M20	
140	60	I-12UAL	INZUNE/ INZU	1.120	I-12UAL	1-120	
150	50						
150	55	M16xL M20xL	M16xL/M16 M20xL/M20	M16 M20	M16xL M20xL	M16 M20	
150	60	M20xL	M20xL/M20	M20	M20xL	M20	
150	75						
164	75	M16xL	M16xL/M16	M16	M16xL	M16	
200	100	M20xL	M20xL/M20	M20	M20xL	M20	

# Waisted cylindrical mounts

### **Product description**

Cylindrical anti-vibration mounts with waists. The standard version is made from natural rubber with an electro-galvanised surface. Can also be ordered as follows:

- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber types CR, EPDM & silicone
- The rubber can be coulered
- AISI 316





Туре	Diameter D [mm]	Small diameter d [mm]	Height H [mm]	Thread G Metric	Length h [mm]	h [mm]	SDWA	SDWB	SDWC
1008-04	10	4.5	8	М3	6	3	•		
1010-08	10	8	10	M4	10	4	•	•	
1515-08	15	8.5	15	M4	10	4	•	•	•
1515-12	15	12	15	M4	10	4	•	•	•
2030-12	20	12	30	M6	18	6	•	•	•
2015-14	20	14	15	M6	18	6	•	•	•
2019-14	20	14	19	M4	10	4	•	•	•
2030-14	20	14	30	M4	10	4	•	•	•
2020-16	20	16	20	M6	18	6	•	•	•
2122-16	21	16	22	M6	18	6	•	•	•
2520-18	25	18	20	M8	23	8	•	•	•
2520–20	25	20	20	M6	10	6	•	•	•
3020-22	30	22	20	M8	23	8	•	•	•
3020-25	30	25	20	M8	23	8	•	•	•
3025-18	30	18	25	M8	20	6	•	•	•
3041-19	30	19.5	41	M8	20	8	•	•	•
3534-25	35	25	34	M8	20	8	•	•	•
3515-31	35	31	15	M8	20	8	•	•	
4030-25	40	25	30	M8	23	8	•	•	•
4030-33	40	33	30	M8	23	8	•	•	•
4050-20	40	20	50	M8	23	8	•	•	•
4030-33	40	33	30	M8	23	8	•	•	•
5050-35	50	35	50	M10	28	10	•	•	•
5030-42	50	42	30	M10	28	10	•	•	•
5015-46	50	46	15	M10	28	10	•		
5545-44	55	44	45	M8	28	8	•	•	•
5744-25	57	25	44	M10	28	10	•	•	•
5745-44	57	44	45	M10	28	10	•	•	•
5745-25	57	25	45	M8	20	8	•	•	•
6060-49	60	49	60	M10	28	10	•	•	•
7053-45	70	45	53	M12	28	12	•	•	•
7253-64	72	64	53	M12	37	12	•	•	•
7540-60	75	60	40	M12	37	12	•	•	•
9575-80	95	80	75	M16	41	16	•	•	•
18075-148	180	148	75	M20	34	20	•	•	•
18075-150	180	150	75	M20	45	20	•	•	•

# Cylindrical mounts

### **Product description**

Cylindrical anti-vibration mounts with a narrow centrepiece.

The standard version is made from natural rubber and has an electro-galvanised surface. Can also be ordered as follows:

- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber types CR, EPDM & Silicone
- The rubber can be stained
- AISI 316



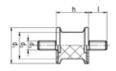




SDSA

SDSB

SDSC





Type + D1H-d2	d, [mm]	H [mm]	d <sub>2</sub> [mm]	d <sub>3</sub> Thread Metric	l [mm]	h [mm]
2030-15	20	30	15	M6	18	6
2040-15	20	40	15	M6	18	6
2520-22	25	20	22	M8	10	8
4028-35	40	28	35	M8	23	8
4030-37	40	30	37	M8	23	8
4625-40	46	25	40	M10	28	10
5030-40	50	30	40	M10	28	10
7540-70	75	40	70	M12	37	12
10075-95	100	75	95	M16	45	16

### **Product description**

Cylindrical anti-vibration mounts with a steel washer for assembling with a hook spanner.

The standard version is made from natural rubber and has an electro-galvanised surface. Can also be ordered as follows:

- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber types CR, EPDM & silicone
- The rubber can be stained
- AISI 316



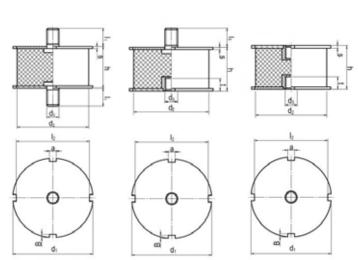




SDHA

SDHB

SDHC



Type +	d <sub>1</sub> [mm]	h [mm]	d <sub>2</sub> [mm]	d₃ Thread Metric	l <sub>1</sub> [mm]	l <sub>2</sub> [mm]	t [mm]	s [mm]	a [mm]	B [mm]
R40	105	40	94	M16	41	95.5	16	3	9	4.5
R55	105	55	94	M16	41	95.5	16	3	9	4.5

Annular mounts SDRV

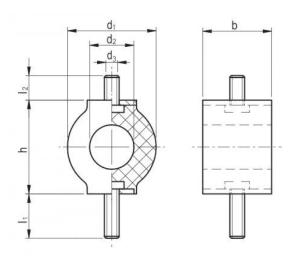
# **Product description**

Type SDRV is an annular mount where the rubber is vulcanised on electro-galvanised steel plates.

These are for low loads like for print circuits and small fans.

Can also be ordered as follows:

- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber types CR, EPDM & Silicone
- The rubber can be stained





_			d	h	h	1		Hardness 55 Sh(A)	
Туре	[mm]	Max. load. [kg]	Deflection [mm]						
SDRV1005	10.5	5.6	M4	12.5	9.5	10	10	2.5	2
SDRV1406	14	6	M4	17	13	10	10	3.5	3
SDRV2512	25	12	M5	30	20	14	14	7.5	5
SDRV3617	36	17	M10	40	26	20	20	15	5
		•	•						

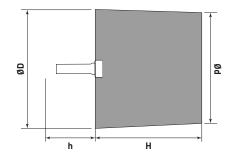
#### **Materials**

- Polyether urethane
- Hardness 65–75 Sh (A)
- Temperature range: -40 °C to + 80 °C
- Short-term temperatures up to + 110 °C
- Is resistant to oils and grease

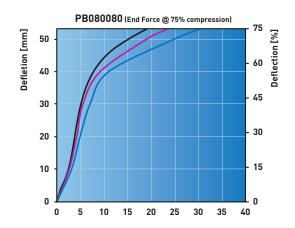
### **Application**

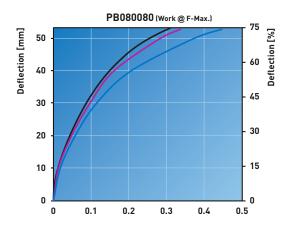
- PUR buffers are used as end stops for cranes and lifts, among other things
- Can also be used as machine feet
- The stated values apply to impacts
- The buffer has excellent shock absorption properties as it can be compressed up to 75 %
- Is less suitable for damping dynamic forces from vibrating machinery
- The maximum compression value for the different buffer types should not be exceeded
- Fix in place using a nut.

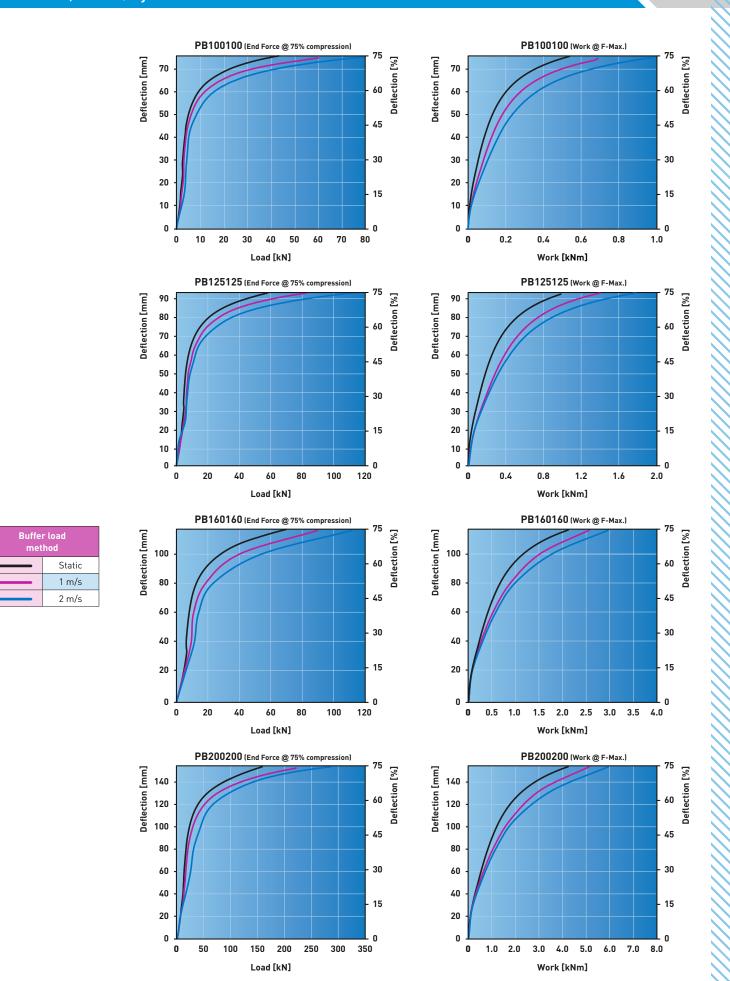




Size Ø D [mm]	Item no.	Dimensions [mm]				Thread	Compression in [mm] of	Compressi- on in [%] of	The final force in [kN] of 75 % compression			Work W [kNm] of F-Max		
		ØD	Ød	Н		External	F-max	F-max	stat.	1 m/s	2 m/s	stat.	1 m/s	2 m/s
80	PB080080	80	72	79	40	M12	approx. 53	75 %	19	23	30	0.31	0.34	0.45
100	PB100100	100	93	100	40	M12	approx. 79	75 %	39	60	76	0.51	0.69	0.94
125	PB125125	125	117	124	40	M12	approx. 94	75 %	58	82	109	0.98	1.40	1.70
160	PB160160	160	152	158	40	M12	approx. 118	75 %	85	120	150	1.17	2.56	2.97
200	PB200200	200	180	202	40	M12	approx. 158	75 %	149	220	270	4.40	6.40	7.70







### VIKAS rubber buffers

### **Product description**

Rubber vulcanised to a steel plate with a centre threaded hole or threaded pin. The standard rubber buffers are made of natural rubber with an electro-galvanised surface.

### **Application**

For the damping of all kinds of fall, impact or shock from cranes, vehicles, closing and stop devices, etc. The buffers absorb the kinetic energy so that the shock upon impact is reduced.

The rubber buffers can also be used in vibration-isolated machinery as a limiting element against excessive fluctuation (for example, for passing resonant frequencies) or as a stop against motion in unwanted directions.

### Assembly

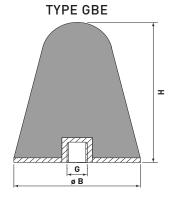
Rubber buffers can be mounted in either the fixed or the movable machine part.

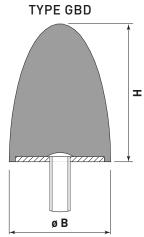
If a rubber buffer does not provide adequate spring, 2 buffers can be connected in series, and if one buffer cannot absorb the energy, two buffers can be mounted parallel to each other.

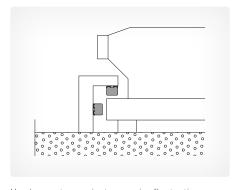
### **Options**

- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber types CR, EPDM & silicone
- The rubber can be stained
- AISI 316

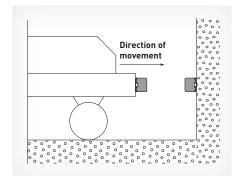




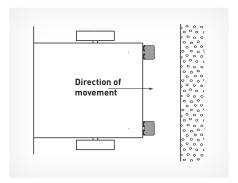




Used as a stop against excessive fluctuation



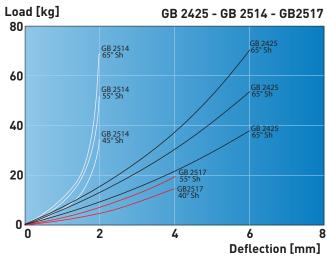
Serial connected buffers.

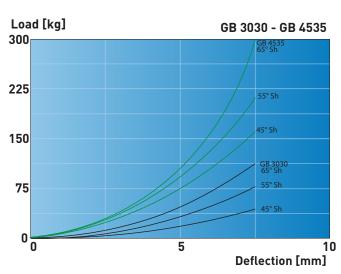


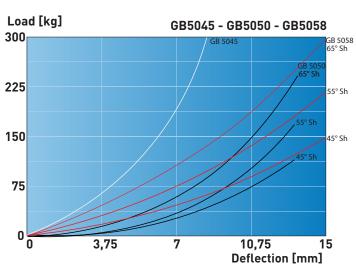
 ${\sf Parallel\ assembly\ of\ buffers}.$ 

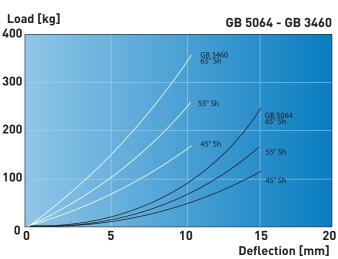
Rubber buffers GB

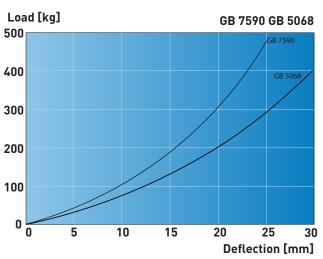
Type +	Maximum load* [kg]	Diameter B [mm]	Height H [mm]	Type GBE Threaded hole	Type GBD Threaded pin
1010		10	10	M5	M5x12
1522		15	22	M6	M6x18
2015		20	15	M6	M6x10
2024		20	24	M6	M6x18
2425	35–70	24	25	M6	M6x18
2514	35–70	25	14	M8	M8x20
2516		25	16	M6	M6x18
2520		25	20	М6	M6x18
3030		30	30	M8	M8x20
3036	80	30	36	-	M8x20
3460	178–356	34	60	M12	M12x30
3540		35	40	М8	M8x23
4535	96–190	45	35	М8	M8x23
5050	117–233	50	50	M10	M10x28
5058	147–293	50	58	М8	M8x20
5061		50	61	М8	M8x28
5064	127–253	50	64	М8	M8x35
5067	280-400	50	67	M10	M10x38
5068	400	50	68	M10	M10x28
6040	209-418	60	40	M14	M14x62
6060	195–395	60	60	M12	M12x37
7058		70	58	M12	M12x32
7060	210-419	70	60	M12	M12x35
7589		75	89	M12	M12x37
7590	480	75	90	M12	-
90110	800	90	110	M12	-
9580	407-814	95	80	M16	M16x45
10095	225–680	100	95	M12	M12x31
100100	220-600	100	100	M12	M12x31
100120	210-630	100	120	M12	M12x31
108121		108	121	M12	M12x25
11080		110	80	M12	M12x25
115136		115	136	M16	M16x41
11877		118	77	M16	M16x41

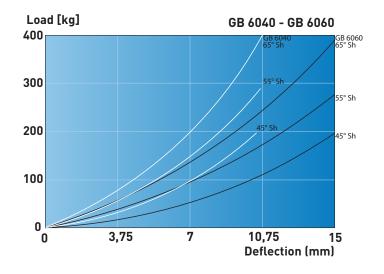


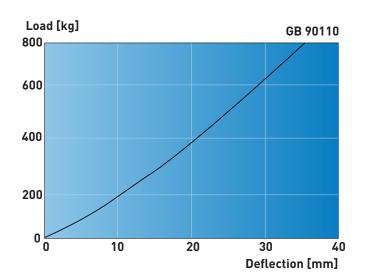


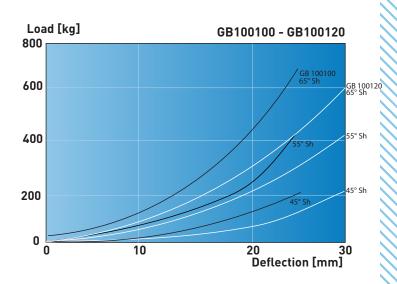


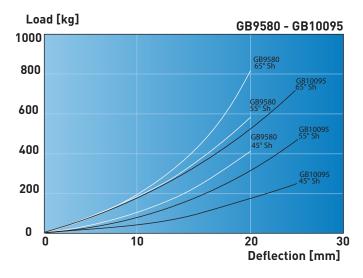






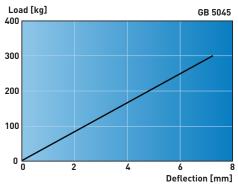


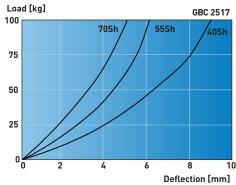


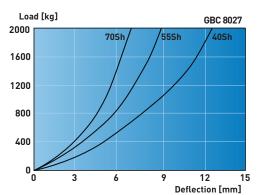


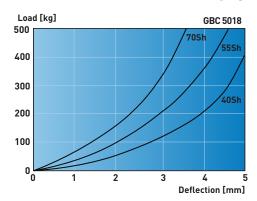
**TYPE GBCD** 

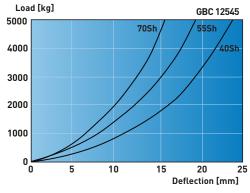
# Rubber buffer, conical





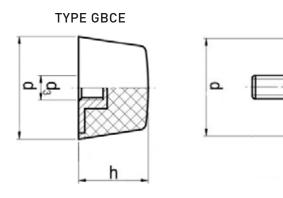






+45 36 77 88 00





Type +	Ø d [mm]	h [mm]	d <sub>3</sub> [mm]	Threaded pin
1212	12	12	M4	M4x10
1406	14	6.3	M4	M4x4
1509	15	9	M5	M5x12
1512	15	12	M5	M5x12
2014	20	14	M6	M6x18
2016	20	16	M6	M6x18
2017	20	17	M6	M6x18
2208	22	8	M6	M6x118
2212	22	12	M6	M6x18
2512	25	12	M6	M6x18
2514	25	14	M4	M4x10
2517	25	17	M6	M6x18
3222	32	22	M8	M8x23
3540	35	40	M8	M8x23
3835	38	35	M10	M10x28
4335	43	35	M10	M10x28
4350	43	50	M10	M10x28
4521	45	21	M8	M8x46
5018	50	18	M10	M10x28
5020	50x50	20	M10	M10x28
5050	50	50	M10	M10x28
6040	60	40	M10	M10x28
7025	70	25	M12	M12x37
8027	80x80	27	M12	M12x37
12545	125	45	M16	M16x45

# Rubber buffer, block

## **Product description**

Rubber block vulcanised to a steel plate with a centre threaded hole or threaded pin. Standard rubber buffers are made from natural rubber with a galvanised surface.

# **Application**

For the damping of all kinds of fall, impact or shock from cranes, vehicles, closing and stop devices, etc. The buffers absorb the kinetic energy so that the shock upon impact is reduced.

## **Assembly**

Rubber buffers can be mounted in either the fixed or the movable machine part.

If a rubber buffer does not provide adequate spring, 2 buffers can be connected in series,

and if one buffer cannot absorb the energy, two buffers can be mounted parallel to each other.

#### **Options**

- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber type NR, CR, EPDM & Silicone, etc.
- The rubber can be stained
- Steel electro-galvanised Fe/Zn12/1A or AISI 316

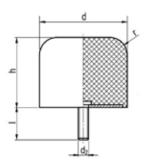




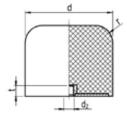




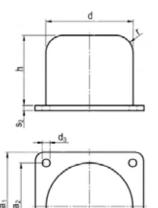
TYPE GBBD



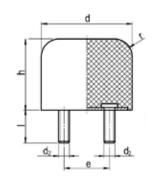




**TYPE GBBF** 



TYPE GBB2D



	<b>6</b> 4				_		_	_	o 1	_	_		Load 70 Sh(A)	
Type +	Ø d [mm]	H [mm]	d <sub>2</sub> [mm]	[mm]	[mm]	[mm]	a <sub>1</sub> [mm]	a <sub>2</sub> [mm]	Ø d <sub>3</sub> [mm]	S <sub>2</sub> [mm]	e [mm]	F [kN]	Deflection [mm]	M [1]
4032	40	32	M8	23	8	8	50	40	5.5	2		1.5	5	70
5040	50	40	M10	28	10	10	63	50	6.5	3		2.2	6	140
5045	50	45	M10			16						3.0	7	180
6350	63	50	M10	27	12	10	80	63	6.5	4		3.2	8	280
8063	80	63	M12	37	18	12	100	80	9	5		7.0	10	560
10080	100	80	M12	37	20	12	125	100	9	6	50	10	14	1120
125100	125	100	M16	36	25	16	160	125	11	6	63	15	17	2240
160125	160	125	M16	44	32	16	200	160	11	8	80	20	21	4400
200160	200	160	M20	44	40	20	260	200	13	8	100	25	26	8800

# Rubber buffer, suction cup/truncated cone

# **Product description**

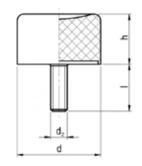
Rubber buffer/machine foot with suction cup effect. The standard version is made from natural rubber and has an electro-galvanised surface. Can also be ordered as follows:

- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber type NR, CR, EPDM & Silicone
- The rubber can be stained
- AISI 316

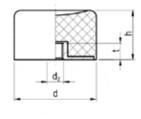
Type +	Ø d [mm]	h [mm]	d <sub>2</sub> [mm]	l [mm]	t [mm]
1514	15	14	M4	10	4
2023	20	23	M6	18	6
2518	25	18	M6	18	6
3028	30	28	M8	20	8
4028	40	28	M8	23	8
5028	50	28	M10	28	10
7043	70	43	M10	27	10
7537	75	37	M12	37	12
10050	100	50	M16	41	16



TYPE GBSD



TYPE GBSE



# **Product description**

Rubber buffer in a truncated cone shape. The standard edition is in natural rubber with an electro-galvanised surface. Can be ordered as follows:

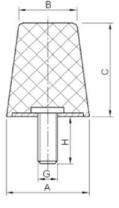
- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber type NR, CR, EPDM & Silicone, etc.
- The rubber can be stained
- AISI 316

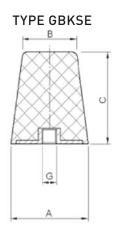
Type +	Ø A [mm]	Ø B [mm]	C [mm]	G [mm]	H [mm]
3835	38	30	35	M10	27
4335	43	30	35	M10	27
4350	43	30	50	M10	25
6350	63	57.5	50	M10	31





TYPE GBKSD





# Rubber buffer, cream puff/round/cone

# **Product description**

Rubber buffer in a cream puff shape. The standard version is in natural rubber with an electro-galvanised surface. Can also be ordered as follows:

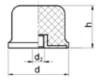
- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber type NR, CR, EPDM & Silicone
- The rubber can be stained
- AISI 316.

Type +	Ø d [mm]	h [mm]	d <sub>2</sub> [mm]	l [mm]
5035	50	35	M10	28
8060	80	60	M12	37
12590	125	90	M16	41

#### **TYPE GBFD**



**TYPE GBFE** 





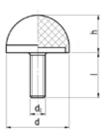
#### **Product description**

Rubber buffer in a round shape. The standard version is in natural rubber with an electro-galvanised surface. Can also be ordered as follows:

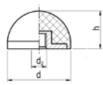
- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber type NR, CR, EPDM & Silicone
- The rubber can be stained
- AISI 316.

Type +	Ø d [mm]	h [mm]	d <sub>2</sub> [mm]	l [mm]
2513	25	13	M6	18
2515	25	15	M6	18
3026	30	26	M8	20
5030	50	30	M8	28

#### TYPE GBRD



**TYPE GBRE** 





#### **Product description**

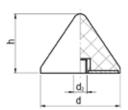
Cone-shaped rubber buffer. The standard version is in natural rubber with an electro-galvanised surface. Manufaturing options as above items.

Type +	Ø d [mm]	h [mm]	d <sub>2</sub> [mm]	l [mm]
2020	20	20	M6	18
2417	24	17	M6	18
2516	25	16	M8	25
2518	25	18	M8	25
3517	35	17	M8	25
4030	40	30	M8	28
6045	60	45	M10	28
8565	85	65	M12	37

TYPE GBKD



TYPE GBKE





# Rubber buffer, truck

# **Product description**

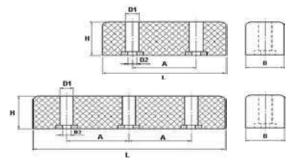
Truck buffer GBT with standard version in natural rubber. Can also be ordered as follows:

Rubber hardness: 45, 55 & 70 Sh(A)

• Rubber type CR, EPDM

Туре	L [mm]	H [mm]	B [mm]	Holes pcs.	A [mm]	D <sub>1</sub> [mm]	D <sub>2</sub> [mm]
GBT 12515	125	15	40	2	60	19.7	8
GBT 12540	125	40	40	2	60	19.8	8
GBT 12550	125	50	43	2	60	20.3	8
GBT 12570	125	70	43	2	60	19.8	8
GBT 20060	200	60	52	2	120	26	10.5
GBT 20080	200	80	52	2	120	26	10.5
GBT 30060	300	60	52	3	115	26	10.5
GBT 30080	300	80	52	3	115	26	10.5
GBT 31535	315	35	60	3	157	26	12.5
GBT 40050	400	50	50	3	165	26	10.5
GBT 40060	400	60	52	3	165	26	10.5
GBT 40080	400	80	52	3	165	26	10.5
GBT 53035	530	35	60	4	157	26	12.5





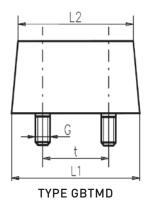
# **Product description**

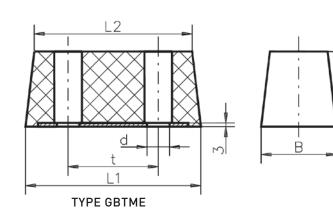
Truck buffer GBTM with metal insert. The standard version is in natural rubber, and it can also be ordered as follows:

- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber type CR, EPDM & Silicone, etc.
- The rubber can be stained



Type +	B [mm]	H [mm]	L1 [mm]	L2 [mm]	G [mm]	t [mm]	d [mm]
12515	60	60	150	136	M10x32	70	11
53035	100	100	200	168	M12x36	90	13





Machine foot NF/NFR

## **Product description**

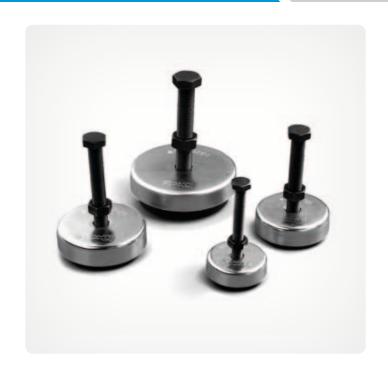
NFR/NF machine foot is used where light or heavy machinery is not going to be attached to the floor or ground. The machine foot's height adjustment can be used to adjust the machine to the required level.

NFR/NF comes with a tilt system adapted for uneven surfaces. The used elastomer is a mixture of oil-resistant nitrile rubber (NBR).

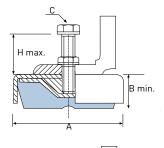
The height is adjusted by means of a screw and it can also be adjusted when the machine is set up on the machine foot. The large surface between the face of the machine and the machine foot provides good overall stability.

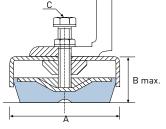
# **Application**

NFR/NF is used mainly for punch presses, milling machines, machine-scissors, lathes, grinding machines, woodworking machines, blowers, fans, compressors, converters, etc.

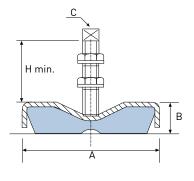


Type NF	Static load [kg]	A [mm]	B min. [mm]	B max. [mm]	С	H max. [mm]	Deflection [mm]
NF-65	320	65	27	34	M12	105	2
NF-85	650	85	33	46	M16	114	2
NF-100	980	100	35	48	M16	120	2
NF-130	2500	130	45	58	M20	130	3
NF-160	4000	160	53	66	M20	130	3
NF-200	5000	200	55	68	M24	158	3
NF-250	7000	250	67	85	M30	153	3





Type NFR	A [mm]	B [mm]	H min. [mm]	С	Static load [kg]	Deflection [mm]
NFR-85	85	33	100	M16	650	2
NFR-100	100	35	100	M16	980	2
NFR-130	130	45	130	M20	2500	3
NFR-160	160	53	130	M20	4000	3
NFR-200	200	55	140	M24	5000	3



# VIKAS machine foot

#### **Product description**

Cylindrical machine foot; type ADM/ADP is made of neoprene rubber with the rubber vulcanised to a galvanised steel washer.

Type ADF is made of red natural rubber with the rubber printed onto the metal washer.

The above machine foot is also available in stainless and acid-proof steel (AISI 316) with the designations RADF, RADM and RADP.

#### **Application**

IAC machine foot can be used to reduce noise and vibrations from machine installations.

The special design of the rubber (the trip-trap pattern) gives the machine foot a large static deflection and thus good vibration isolation.

Type ADF can be used for smaller machines, instruments and office equipment, as well as for household and hobby

Type ADM/ADP is mainly used for punch presses, milling machines, machine-scissors, lathes, grinding machines, woodworking machines, blowers, fans, compressors, converters, etc.

Type ADM/ADP can advantageously be used in places where cleaning agents are used which come into direct contact with the machine foot.

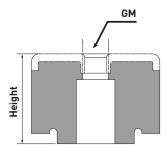
#### Accessories

Adjustable spindles and top plate is available for type ADM/ADP. The latter is used to "connect" several machine feet.

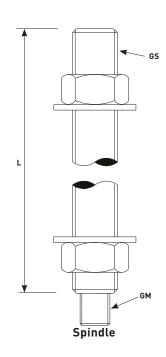
The spindle can be supplied in a galvanised version or in stainless steel type AISI 316.

#### **ALSO AVAILABLE IN STAINLESS**



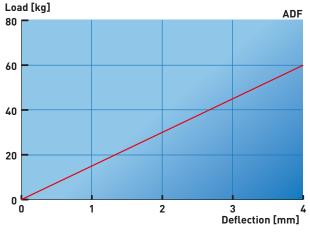


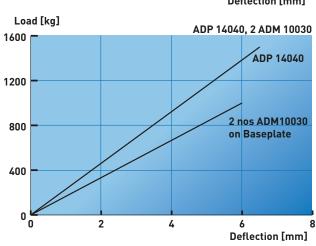


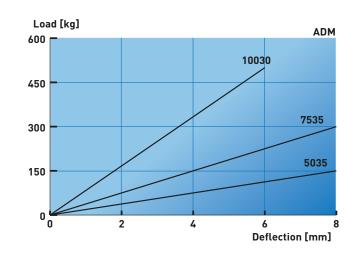


	Max. static load	Dynamic load at	Diameter	Height		Spindle for the machine foot				
Туре	[kg]	120 rpm [kg]	[mm]	[mm]	Thread GM	Article no.	Thread GS	L [mm]		
ADF 4020	60	40	40	20	Ø6.5 hole		-	-		
ADM 5035	150	100	50	35	M10	SPM12	M12	130		
ADM 7535	300	150	75	35	M12	SPM16	M16	130		
ADM 10030	500	300	100	30	M12	SPM16	M16	130		
ADP 14040	1500	1000	140	40	M16	SPM24	M24	180		

# Deflection, static load







#### FP 10030/2 Base plate



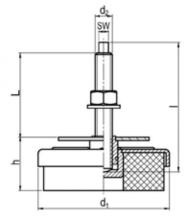
	Length [mm]	Width [mm]	Thickness [mm]	Threaded centre hole
FP 10030/2	195	80	10	M16

# **Product description**

Machine foot MSL can take a large load-to-size ratio. MSI can easily be used to make machines level by turning the threaded rod with a key around SW.

#### **Application**

Can be used for a variety of applications, including production machinery, presses, punching machines, and many others.





Туре	d1 [mm]	d2 [mm]	h [mm]	l [mm]	L [mm]	Thread SW
MSL-1	80	M12	38-48	100	75–65	8
MSL-2	120	M16	43-55	120	80-68	9
MSL-3	160	M20	48-63	170	125-110	12

Туре	Static load [kg]	Max. load at > 200 strokes/min [kg]	Max. load at 200-125 strokes/ min [kg]	Max. load at < 125 strokes/min [kg]
MSL-1	600	120	140	200
MSL-2	1500	250	350	400
MSL-3	3000	700	1000	2500

VIKAS cone mounts FA

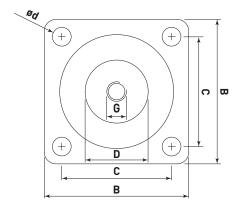
# **Product descriptions**

Rubber truncated cone vulcanised on electro-galvanised steel washers. The anti-vibration mount is made of natural rubber. In the white colour code, a hollow version is produced for smaller loads.

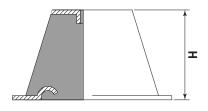
#### **Application**

The anti-vibration mount can be used for damping noise and vibrations from small machine installations, for example, small fans, pumps, motors, compressors, converters and vibration tables.

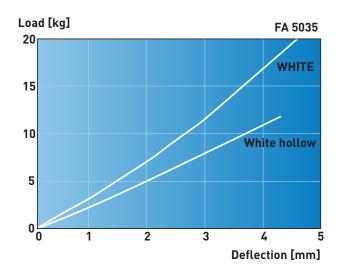
The anti-vibration mount can also be used to isolate external vibrations, for example, radio transmitters, gauges, navigation instruments and vibration isolation of equipment during transport.



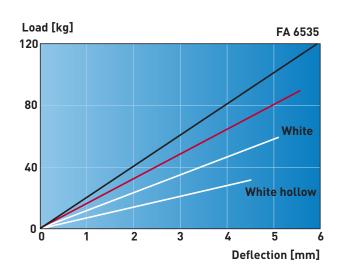




_	Hardness /	Hardness	Maximum	Static			Dimens	ions [mm]			
Туре	rubber colour	Sh(A)	load [kg]	deflection [mm]	D	н	G	В	С	ød	
FA5035	White hollow	45	12	4.3	20	35	M8	50	39	5	
FASUSS	White	White 45 20		4.6	20	35	M8	50	37	5	
	White hollow	45	30	4.5			M10				
FA / F2 F	White	45	60	5.1	32	0.5	M8/M10	65		7.5	
FA6535	Red	55	90	5.6	32	35	M10	65	48	7.5	
	Black	65	120	5.9			M10				



+45 36 77 88 00



IAC mount SD4343

#### **Product description**

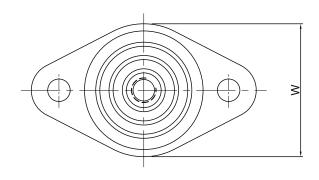
The IAC SD4343 mount is moulded from high-quality natural rubber in three different hardnesses. The mount has an internal thread centred at the top for assembling equipment. The base is reinforced with a steel plate.

If the mount ever needs replacing, the mount's unique colour code ensures that exactly the same type is ordered. The IAC name is also embedded in the rubber of the base plate of each mount.

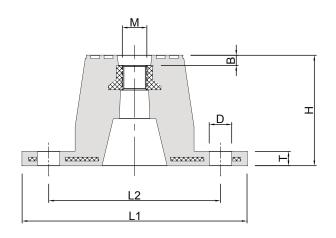
#### **Application**

Due to its geometry, IAC SD4343 provides substantial deflection and good vibration isolation, and is also used for many applications such as:

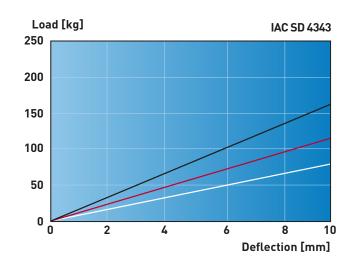
- Fans
- Refrigeration equipment
- Pumps
- Compressors
- Floating floors
- For the isolation of studios and anechoic chambers







Tuna	Colour	Hardness	Load [kg]	Deflection				Dimensions [mm]				
Туре	Cotour	Sh(A)	Loau [kg]	[mm]	L1	W	Н	L2	Т	D	<b>B</b> 5 5 5	М
IAC SD 4343H	White	40	80	10	110	65	54	84	7	11		M12
IAC SD 4343R	Red	50	115	10	110	65	54	84	7	11	5	M12
IAC SD 4343S	Black	60	165	10	110	65	54	84	7	11	l	M12



Cone mount FAV

# **Product description**

FAV cone mount provides high deflection, which results in an excellent reduction of vibrations and good shock absorbing, both horizontally and vertically.

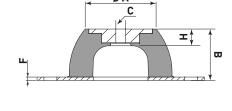
The standard version is made from natural rubber and has an electro-galvanised surface. Can also be ordered as follows:

- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber types CR, EPDM & silicone
- The rubber can be stained
- AISI 316

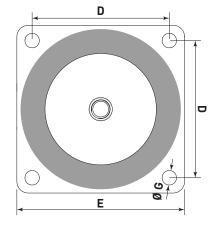
## **Application**

FAV can be used in a wide variety of devices such as fans, pumps, compressors and vibrators, etc.

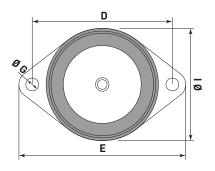
#### **ALSO AVAILABLE IN STAINLESS**



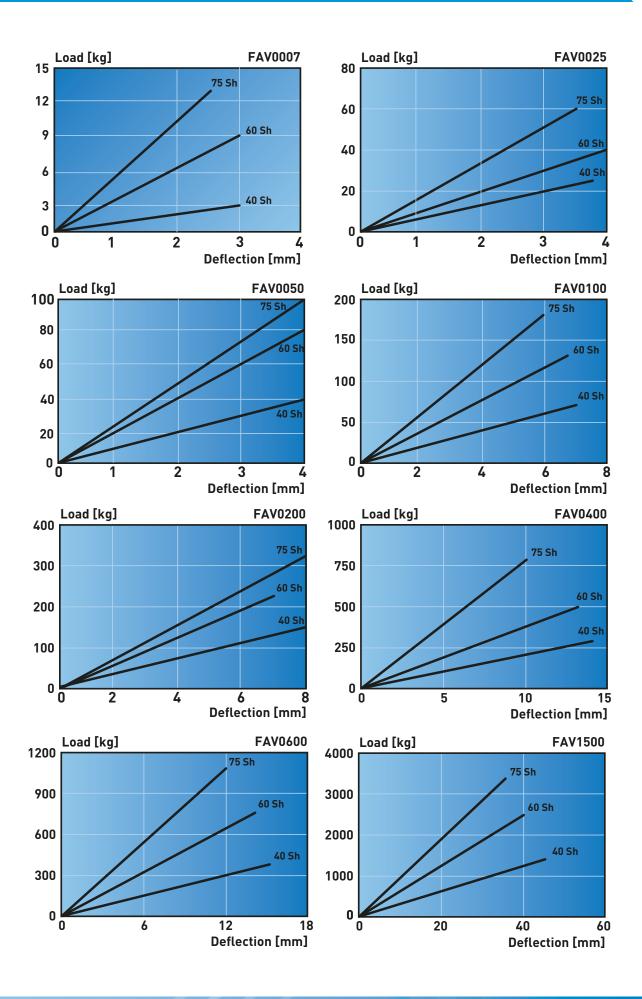
FAV0400 FAV0600 FAV1500



FAV0007 FAV0025 FAV0050 FAV0100 FAV0200



	Ø A			D	_	F	ØG		Ø1	40	Sh	60	Sh	75	Sh
Туре	[mm]	B [mm]	С	[mm]	E [mm]	[mm]	[mm]	[mm]	Ø I [mm]	Max. load [kg]	Deflection [mm]	Max. load [kg]	Deflection [mm]	Max. load [kg]	Deflection [mm]
FAV0007	18	20	M6	50	64	2	7.0	7	43	3.5	3.0	9	3.0	13	2.5
FAV0025	33	25	M8	66	85	2	8.0	11	56	25	3.7	40	4.0	60	3.5
FAV0050	45	35	M10	92	114	2	10.0	14	76	40	4.0	80	4.0	100	4.0
FAV0100	53	40	M10	110	136	2	11.5	15	96	70	7.0	130	6.7	180	6.0
FAV0200	58	45	M10	124	151	3	11.5	13	101	150	8.0	220	7.0	320	8.0
FAV0400	70	63	M12	120	150	3	14.5	18	-	280	14.0	500	13.0	800	10.0
FAV0600	100	85	M16	160	200	4	14.5	25	-	380	15.0	750	14.0	1100	12.0
FAV1500	186	160	M24	250	310	6	18.0	43	-	1400	45.0	2500	40.0	3400	35.0



V-mount V/W

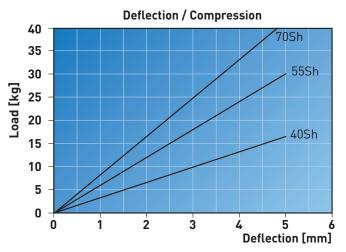
#### **Product description**

The V-mount has offset mounting holes for easy installation. The standard version is made from natural rubber and has an electro-galvanised surface. Can also be ordered as follows:

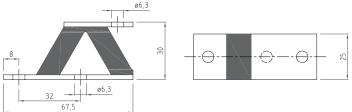
- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber type NR, CR, EPDM & Silicone
- The rubber can be stained
- AISI 316

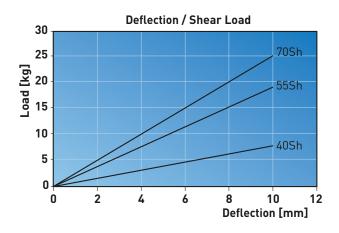
# **Application**

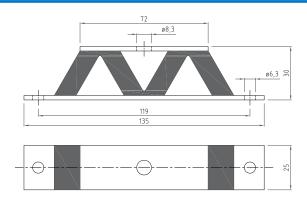
The V-mount can be used in a wide variety of devices, fans, pumps, compressors and vibrators

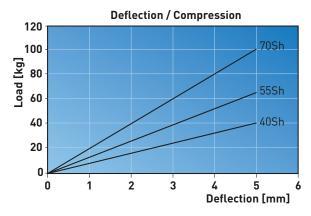




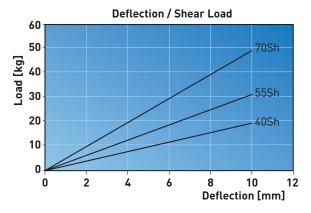














U bracket DU/DUA/BA

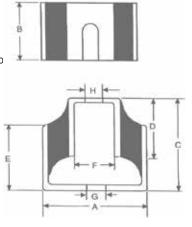
# **Product description**

The double U mount works by plane loading the rubber in two directions. It is very soft. The load compresses the rubber along the long side of the mount, and it is much mo rigid in that direction. The standard version is in natural rubber. It can also be ordered as follows:

- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber types CR, EPDM & silicone
- The rubber can be stained

# **Application**

Double U mount can be used in a wide range of devices such as fans, pumps, compressors and vibrators.

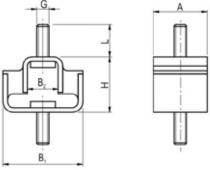


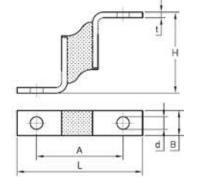


						Hardness	40 Sh(A)	Hardness 50 Sh(A)		Hardness	60 Sh(A)	Hardness 70 Sh(A)	
Туре	A [mm]	C [mm]	B [mm]	G & H [mm]	E [mm]	Max. load [kg]	Deflection [mm]						
DU06041	60	41	50	11	30	40	10	60	10	70	6		
DU07162	71	62	25	11	43	20	10	40	10	60	10	90	10
DU07978	79	78	50	13.5	56	90	10	145	10	200	10	300	10
DU087108	87	108	65	17.5	83	190	10	290	10	400	10	600	10
DU100130	100	130	80	17.5	100	250	10	425	10	620	10	950	10









Туре	B1 [mm]	H [mm]	A [mm]	B2 [mm]	L [mm]	G [mm]
DUA5220	52	36	35	20	21	М8
DUA	54	40	50	22	22	M10

Туре	A	B	L	H	d	t	Load	Deflection
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	[mm]
BA020 2A	52	20	80	57	8	4	27	6

# Mini/Small/Medium/Large

## **Product description**

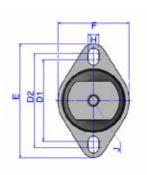
Hydromounts consist of a spring and a hydraulic shock absorber. Obtaining good isolation requires low damping, and restricting movement requires high damping. Hydromounts work with these two conflicting conditions so that the optimum ratio is obtained.

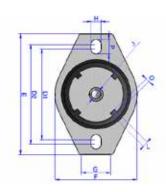
# **Application**

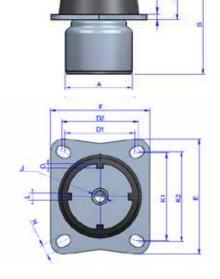
Hydromounts are primarily designed for vibration isolation and the stability of cabs in vehicles used on rough terrain, in agriculture, in forestry, etc. Besides vibration isolation and stability, the absorber also creates high operator comfort.

Hydromounts are also used under engines which run with variable speeds and have uneven operation. Examples of this could be engines with one, two or three cylinders.









Туре	A Ø [mm]	B [mm]	C [mm]	D1 [mm]	D2 [mm]	K1 [mm]	K2 [mm]	E [mm]	F [mm]	G [mm]	H [mm]	l [mm]	J [mm]	L [mm]	N [mm]	0 [mm]
Mini	45	60	30	64	73	-	-	88	90	-	8.2	3	М8	-	30	-
small	63	86	36	99	109	-	-	132	90	34	11	5	M10	5.8	45	4.2
Small Retc	63	86	36	64	70	79.5	82.5	105	90.5		10.2	5	M10	5.8	45	4.2
Medium	63	96	45	99	109	-	-	132	90	40	11	5	M12	6	60	4.2
Medium Rect.	63	96	45	64	70	79.5	82.5	102	92	-	10.2	5	M12	6	60	4.2
Medium HS 2	63	96	45	99	109	-	-	132	90	34	11	5	M12	6	75	4.2
Medium HS 4	63	96	45	64	70	79.5	82.5	102	90.5		10.2	5	M12	6	75	4.2
Large	105	115	55	130	145	-	-	180	110	49	11	5	M16	8.2	80	3.3
Large Rect.	105	115	55	110	110	110	110	130	130	-	12	5	M20	8.2	80	3.3

	40 S	h(A)	50 S	h(A)	60 S	h(A)	70 Sh(A)		
Туре	Max. load [kg]	Deflection [mm]							
Mini	20	5.8	30	5.5	50	5	70	5	
Small + Small Rect.	60	6	100	6.3	145	6.7	180	6	
Medium + Medium Rect.	100	6.7	150	8	200	8	250	8	
Medium HS 2 + HS 4	125	6.7	180	8	250	8	300	8	
Large + Large Rect.	235	7	295	6.4	345	5.4	410	3.5	

Sandwich mount VIKASH

# **Product description**

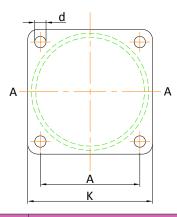
The VIKASH sandwich mount can handle high compression pressure for static loads as well as shocks. The mount also provides good insolation when subjected to a horizontal load. The mount can be mounted flat or in a "V" combination where the device is at a 45° angle towards the middle of the centre of gravity.

The mount consists of two outer mounting plates with four mounting holes in each one. Between the mounting plates there is vulcanised rubber with stabilising steel plates. Each mount is available in two rubber hardnesses, covering a wide load range between 2 and 30 tonnes.

#### **Application**

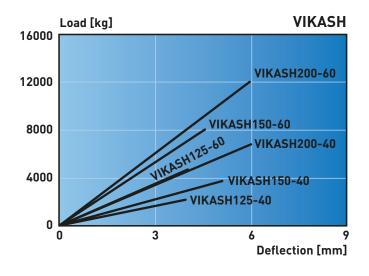
High compression, low transverse stiffness and relatively low installation height make VIKASH mounts ideal for heavy machinery.

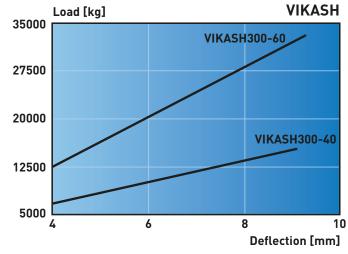




			Dimensions			Manuskansiubk	Compression 40 Sh(A)		Compression 60 Sh(A)	
Туре	H [mm]	A [mm]	0 [mm]	d [mm]	t [mm]	Mount weight (kg)	Max. load [kg]	Deflection [mm]	Max. load [kg]	Deflection [mm]
VIKASH125	52	118	148	13.5	5	2.6	2250	3.6	4500	3.5
VIKASH150	63	136	166	13.5	6	4.5	3750	4.9	7500	4.2
VIKASH200	85	184	220	17	8	9.2	6000	6.0	12000	5.9
VIKASH300	120	270	310	22	10	27	15000	9.1	30000	9.3

	Shear 4	0 Sh(A)	Shear 60 Sh(A)			
Туре	Maximum load [kg]	Deflection [mm]	Maximum load [kg]	Deflection [mm]		
VIKASH125	240	21	550	23		
VIKASH150	330	23	800	25		
VIKASH200	600	30	1200	28		
VIKASH300	1500	43	3300	45		





Sandwich mount VIKAS 100-700

# **Product description**

The sandwich-constructed anti-vibration mount is made of galvanised steel plates, between which is vulcanised natural rubber.

The anti-vibration mount is made in three rubber hardnesses. The colour of the rubber indicates its hardness.

#### **Application**

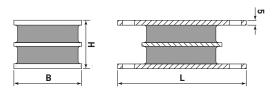
The sandwich mount can be used to reduce noise and vibrations from large stationary machine installations, such as blowers, fans, pumps, diesel generators and the like. Can also be used for vibration tables.

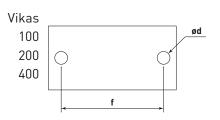
The anti-vibration mount is designed for pressure load, but can withstand minor shear forces.

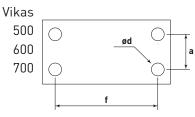
The maximum shear force and the spring constant of the load in the shear is shown in the following table.



#### **ALSO AVAILABLE IN STAINLESS**



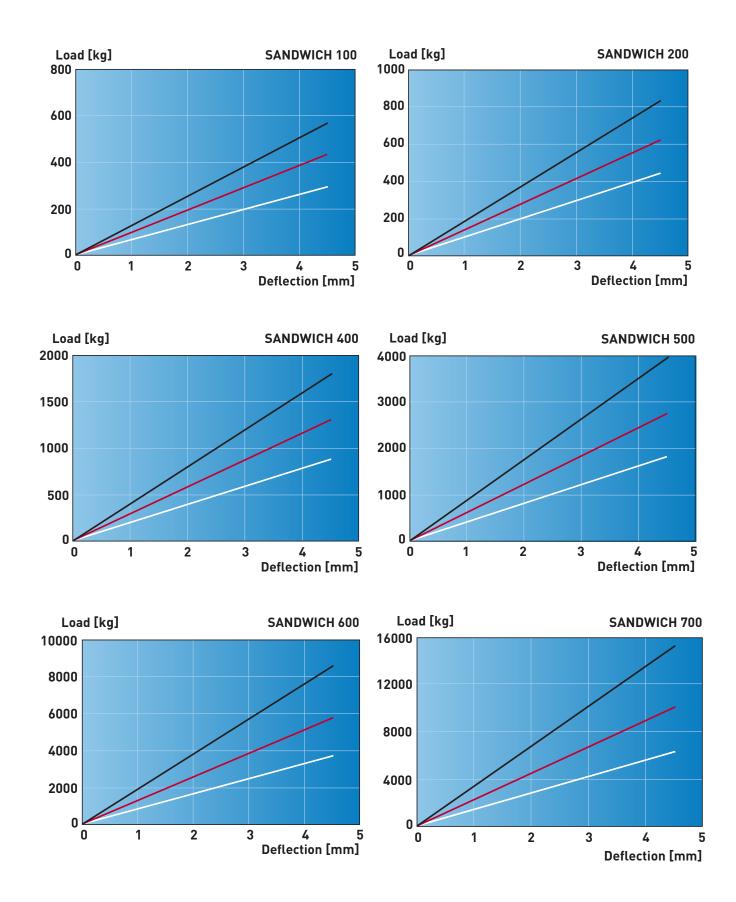




	Hardness/	Compr	ession	Sho	ear				Dimensi	ons (mm)		
Type Vikas	rubber colours	Maximum load [kg]	Static de- flection [mm]	Maximum load [kg]	Spring constant [kg/mm]	Stiffness ratio*	Н	В	L	a	f	ød
	White	300		65	3.9	1.31						
100	Red	440	4.5	110	6.4	1.32	43	57	108	-	89	11
	Black	570		155	9.6	1.53						
	White	440		85	5.5	1.31		57				
200	Red	620	4.5	140	8.5	1.32	43		127	-	108	11
	Black	830		200	12.7	1.53						
	White	850	4.5	150	9	1.31		57	168	-	146	
400	Red	1300		235	14	1.32	43					11
	Black	1800		345	21	1.53						
	White	1800		225	13	1.31		83	216	51	178	11
500	Red	2700	4.5	375	23	1.32	43					
	Black	4000		540	35	1.53						
	White	3700		420	24	1.31						
600	Red	5800	4.5	680	40	1.32	43	108	251	51	210	13
	Black	8600		935	54	1.53						
	White	6400		505	30	1.31						
700	Red	10000	4.5	855	52	1.32	43	108	302	51	260	14
	Black	15000		1180	71	1.53						

 $<sup>{}^{*}\</sup>mathsf{Stiffness}$  ratio is the ratio between the dynamic and static stiffness





Rubber metal rails GMS

#### **Product description**

The rails are made of natural rubber which is vulcanised to a single or double steel plate.

The rails come in 3 rubber hardnesses:

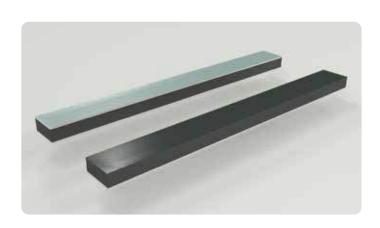
- 45 Sh(A)
- 55 Sh(A)
- 65 Sh(A)

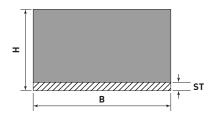
The rails can also be made in stainless steel with Neoprene rubber, for use in oil-containing and ozone-containing environments.

#### **Application**

Our rails are particularly suited to damping extra large/ heavy plants and machinery. Due to the great flexibility of the rails' design, the damping of foundations, lathes and elevators can be dimensioned individually.

It is possible to shorten the rails to the desired lengths, drill holes and cut threads in the steel parts for assembly.





GMS-1: A steel rail

Width W [mm]	Height H [mm]	Length [mm]	Steel thickness ST [mm]	Deflection S [mm] NOTE 1	45 Sh (A) Max. load [kg]	55 Sh(A) Max. load [kg]	65 Sh(A) Max. load [kg]
				1	14	31	67
25	25	2000	5*,10	3	45	100	216
				5	83	182	392
				2	20	47	103
25	30	2000	5*,10	4	44	99	217
				8	102	227	496
				2	32	71	155
30	30	2000	5*,10	4	68	152	329
				8	161	352	760
				1	88	175	364
40	20	2000	5*,10	3	313	618	1272
				5	648	1260	2573
				3	76	168	363
40	35	2000	5*,10	6	167	365	787
				9	279	604	1298
				3	49	112	246
40	45	2000	5*,10	6	105	237	517
				9	167	376	821
				3	137	293	626
50	35	2000	5*,10	6	303	644	1371
				9	515	1081	2291
				3	105	229	493
50	40	2000	5*,10	6	226	492	1058
				9	372	802	1719

Note 1
Deflection S (mm) from the test pieces with the dimensions:
[Length = 2 x width] and with the steel thickness marked with (\*)

GMS-1 (continued)

Width W [mm]	Height H [mm]	Length [mm]	Steel thickness ST [mm]	Deflection S [mm] NOTE 1	45 Sh(A) Max. Load [kg]	55 Sh(A) Max. Load [kg]	65 Sh(A) Max. Load [kg]
				3	85	188	408
50	45	2000	5*,10	6	180	398	554
				9	290	637	1378
				4	96	216	471
50	50	2000	5*,10	8	206	462	1006
				12	337	749	1625
				4	83	188	410
50	55	2000	5*,10	8	176	397	868
				12	282	635	1385
				1	168	330	677
60	30	2000	5.10*	3	573	1116	2282
				5	1110	2143	4360
				1	102	209	435
60	35	2000	5.10*,15	3	336	680	1416
				5	621	1247	2585
				4	183	398	856
60	50	2000	5.10*	8	404	871	1866
				12	681	1453	3099
				4	128	286	620
60	60	2000	5.10*,15	8	273	607	1317
				12	442	976	2112
				4	80	184	404
60	80	2000	5.10*	8	167	381	838
				12	261	596	1307

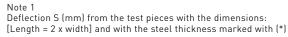
Note 1
Deflection S (mm) from the test pieces with the dimensions:
[Length = 2 x width] and with the steel thickness marked with (\*)

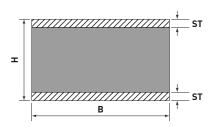


Rubber metal rail GMS

GMS-1 (continued)

JMS-1 (continued)												
Width W [mm]	Height H [mm]	Length [mm]	Steel thickness ST [mm]	Deflection S [mm] NOTE 1	45 Sh(A) Max. load [kg]	55 Sh(A) Max. load [kg]	65 Sh(A) Max. load [kg]					
				1	280	539	1095					
70	30	2000	5.10*	3	966	1842	3725					
				5	1888	3571	7186					
				2	170	355	752					
70	45	2000	5.10*	4	360	751	1585					
				8	826	1702	3573					
				2	133	283	604					
70	50	2000	5.10*	4	278	591	1259					
				8	618	1304	2766					
				4	188	413	891					
70	60	2000	5.10*	8	404	882	1900					
	00	2000	5.15	12	658	1427	3063					
				2	252	516	1081					
80	45	2000	5.10*	4	536	1095	2288					
00	45	2000	3.10									
				8	1242	2505	5206					
00	/0	2000	F 10*	4	267	576	1234					
80	60	2000	5.10*	8	577	1237	2644					
				12	945	2011	4285					
				4	156	351	764					
80	80	2000	5.10*,15	8	327	731	1591					
				12	514	1147	2492					
	45		10*,15	2	505	1000	2060					
100		2000		4	1084	2137	4391					
				8	2550	4969	10156					
				4	615	1264	2651					
100	55	2000	10*,15	8	1368	2786	5817					
				12	2318	4675	9718					
				4	497	1038	2193					
100	60	2000	10*,15	8	1084	2250	4738					
				12	1798	3699	7760					
				4	272	597	1287					
100	80	2000	5.10*,15	8	572	1249	2691					
				12	905	1969	4335					
				2	1367	2579	5185					
120	45	2000	10.15*	4	3007	5648	11324					
				8	7509	13959	27836					
				4	1081	2159	4464					
120	60	2000	10.15*	8	2426	4803	9893					
				12	4157	8152	16714					
				4	505	1069	2272					
120	80	2000	10.15*	8	1074	2263	4800					
				12	1725	3613	7644					
				4	2251	4345	8837					
150	60	60 2000	10.15*	8	5105	9751	19818					
				12	8853	16821	33936					
				4	1320	2697	5640					
200	100	2000	15*	8	2781	5659	11812					
	100	2000				8939						
200	100	2000		12	4412	8939	18618					





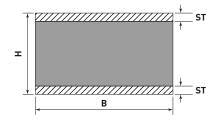
GMS-2: Two steel rails

Width W [mm]	Height H [mm]	Length [mm]	Steel thickness ST [mm]	Deflection S [mm] NOTE 1	45 Sh(A) Max. load [kg]	55 Sh(A) Max. load [kg]	65 Sh(A) Max. Load [kg]
				1	14	283	604
25	25	2000	5*,10	3	45	591	1259
				5	83	1304	2766
				2	20	47	103
25	30	2000	5*,10	4	44	99	217
				8	102	227	496
				2	32	71	155
30	30	2000	5*,10	4	68	152	329
				8	161	352	760
	20			1	88	175	364
40	20	2000	5*,10	3	313	618	1272
				5	648	1260	2573
				3	76	168	363
40	35	2000	5*,10	6	167	365	787
				9	279	604	1298
				3	49	112	246
40	45	2000	5*,10	6	105	237	517
				9	167	376	821
				3	137	293	626
50	35	2000	5*,10	6	303	644	1371
			·	9	515	1081	2291
				3	105	229	493
50	40	2000	5*,10	6	226	492	1058
				9	372	802	1719

Note 1
Deflection S (mm) from the test pieces with the dimensions:
[Length = 2 x width] and with the steel thickness marked with (\*)



Rubber metal rail GMS



GMS-2 (continued)

GMS-2	GMS-2 (continued)												
Width W [mm]	Height H [mm]	Length [mm]	Steel thickness ST [mm]	Deflection S [mm] NOTE 1	45 Sh(A) Max. load [kg]	55 Sh(A) Max. Load [kg]	65 Sh(A) Max. load [kg]						
				3	85	188	408						
50	45	2000	5*,10	6	180	398	554						
				9	290	637	1378						
				4	96	216	471						
50	50	2000	5*,10	8	206	462	1006						
				12	337	749	1625						
				4	83	188	410						
50	55	2000	5*,10	8	176	397	868						
				12	282	635	1385						
				1	168	330	677						
60	30	2000	5.10*	3	573	1116	2282						
				5	1110	2143	4360						
				1	102	209	435						
60	35	2000	5.10*,15	3	336	680	1416						
				5	621	1247	2585						
60			E 10*	4	183	398	856						
	50	2000	5.10*	8	404	871	1866						
				12	681	1453	3099						
				4	128	286	620						
60	60	2000	5.10*,15	8	273	607	1317						
				12	442	976	2112						
				4	80	184	404						
60	80	2000	5.10*	8	167	381	838						
				12	261	596	1307						
				1	280	539	1095						
70	30	2000	5.10*	3	966	1842	3725						
				5	1888	3571	7186						
				2	170	355	752						
70	45	2000	5.10*	4	360	751	1585						
				8	826	1702	3573						
				2	133	283	604						
70	50	2000	5.10*	4	278	591	1259						
				8	618	1304	2766						
				4	188	413	891						
70	60	2000	5.10*	8	404	882	1900						
				12	658	1427	3063						
				2	252	516	1081						
80	45	2000	5.10*	4	536	1095	2288						
		2000	0.10	8	1242	2505	5206						

Note 1
Deflection S (mm) from the test pieces with the dimensions:
[Length = 2 x width] and with the steel thickness marked with (\*)

GMS-2 (continued)

OM3-2 (continueu)												
Width W [mm]	Height H [mm]	Length [mm]	Steel thickness ST [mm]	Deflection S [mm] NOTE 1	45 Sh(A) Max. load [kg]	55 Sh(A) Max. load [kg]	65 Sh(A) Max. load [kg]					
				4	267	576	1234					
80	60	2000	5.10*	8	577	1237	2644					
				12	945	2011	4285					
				4	156	351	764					
80	80	2000	5.10*,15	8	327	731	1591					
				12	514	1147	2492					
				2	505	1000	2060					
100	45	2000	10*,15	4	1084	2137	4391					
				8	2550	4969	10156					
				4	156	351	764					
80	80	2000	5.10*,15	8	327	731	1591					
				12	514	1147	2492					
				2	505	1000	2060					
100	45	2000	10*,15	4	1084	2137	4391					
				8	2550	4969	10156					
			10*,15	4	615	1264	2651					
100	55	2000		8	1368	2786	5817					
				12	2318	4675	9718					
				4	497	1038	2193					
100	60	2000	10*,15	8	1084	2250	4738					
				12	1798	3699	7760					
				4	272	597	1287					
100	80	2000	5.10*,15	8	572	1249	2691					
				12	905	1969	4335					
				4	1367	2579	5185					
120	45	2000	10.15*	8	3007	5648	11324					
				12	7509	13959	27836					
				2	1081	2159	4464					
120	60	2000	10.15*	4	2426	4803	9893					
				8	4157	8152	16714					
				4	505	1069	2272					
120	80	2000	10.15*	8	1074	2263	4800					
				12	1725	3613	7644					
				4	2251	413	891					
150	60	2000		8	5105	882	1900					
				12	8853	1427	3063					
				4	1320	2697	5640					
200	100	2000	15*	8	2781	5659	11812					
			12	4412	8939	18618						

Note 1
Deflection S (mm) from the test pieces with the dimensions:
[Length = 2 x width] and with the steel thickness marked with [\*]



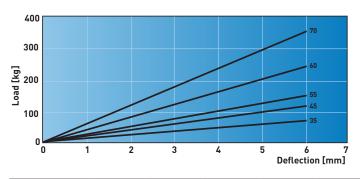
Cast foot mount CFM

# **Product description**

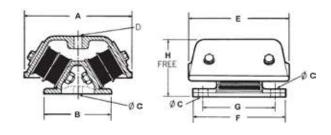
A universal mount which is popular for use in a variety of applications. The rubber is loaded in compression and shear, thereby providing a large reduction of vibrations. The steel cover protects it from UV radiation and shields the rubber from any dripping oil or fuel. Available with fastening for mobile installations

# **Application**

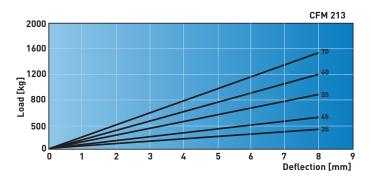
Diesel engines, generators, pumps, compressors, vehicles, marine engines and fans.

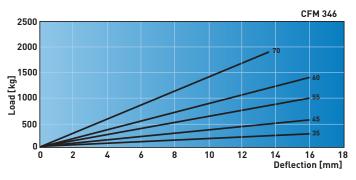




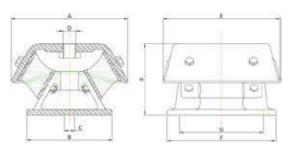


	A B C D		6	_		G	н	Stiffness ratio			
Туре	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Vertical	Longitud- inal	Across
CFM 219	132	82	13	M16	122	114	90	71.5	1.00	0.25	2.00









	Type A [mm]	B				F G			Stiffness ratio		
Туре		[mm]	Vertical	Longitud- inal	Across						
CFM 213	204	146	18	M16	230	205	165	110	1.00	0.25	2.50
CFM 346	204	146	18	M16	230	205	165	120	1.00	0.30	1.70

For freestanding installations, rubber sheets can be supplied for placing under the mount



Captive mounts CMH

## **Product description**

Captive anti-vibration mounts are designed with built-in overload protection, which controls the equipment during transport and provides complete protection in both stationary and mobile conditions.

A universal mount which is popular for use in a variety of applications. Effective mounts that are easy to install, at reasonable prices. The rubber is loaded in compression and shear and the CMH type's great height provides a large reduction of vibrations.

The steel cover protects from UV radiation and shields the rubber from any dripping oil or fuel.

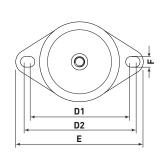
Load of 35 kg to 4000 kg

## **Application**

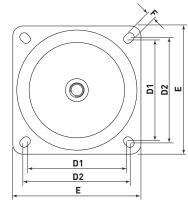
Diesel engines, generators, pumps, compressors, vehicles, marine engines, mobile installations, construction machines and fans.

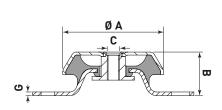


CMH060 CMH070 CMH080 CMH110 CMH150



CMH180 CMH220

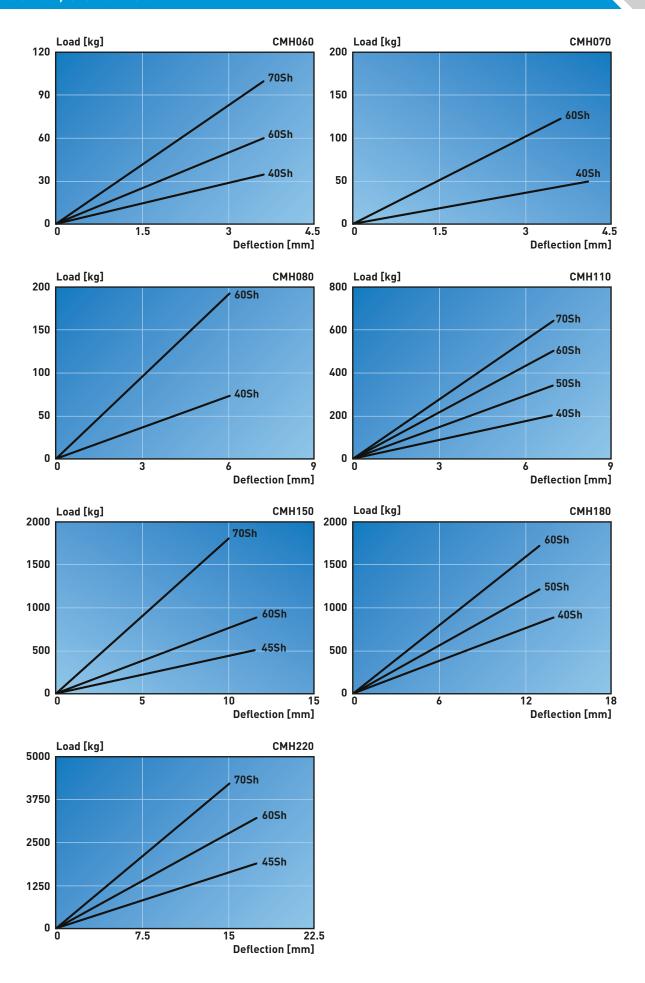




Туре	A Ø [mm]	B [mm]	С	D1 [mm]	D2 [mm]	E [mm]	F [mm]	G [mm]
CMH060	63	35	M10 & M12	76	90	110	9	2.5
CMH070	65	35	M12	100	-	120	15	3
CMH080	83	35	M10 & M12	108	110	135	11	3
CMH110	106	42	M12 & M16	138	146	171	12.5	3
CMH150	155	53	M16	176	188	216	14	4
CMH180	183	86	M20	146	-	180	14.5	5
CMH220	220	105	M24	180	-	220	17.5	6

	Hardness	40 Sh(A)	Hardness	45 Sh(A)	Hardness	s 50 Sh(A)	Hardness	60 Sh(A)	Hardness	70 Sh(A)
Туре	Max. load [kg]	Deflection [mm]								
CMH060	35	3.5	-	-	-	-	60	3.5	100	3.5
CMH070	50	4.0	-	-	-	-	120	3.5	-	-
CMH080	70	6.0	-	-	-	-	190	6.0	-	-
CMH110	200	7.0	-	-	360	7.0	500	7.0	625	7.0
CMH150	-	-	500	12	-	-	800	12.0	1800	10.0
CMH180	900	15.0	-	-	1200	14.0	1700	14.0	-	-
CMH220	-	-	1500	18.0	-	-	3000	18.0	4000	15.0





# Captive mounts

## **Product description**

The design of the BRB mount means the rubber works in both shear and compression, offering good stability as well as good vibration damping. BRB's relatively tall height means high deflection.

# Technical properties

- Certificate: "Det Norske Veritas' Rules for Classification of Ships/High Speed and Light Craft"
- The steel upper part protects the rubber from dripping liquids, as well as UV light.
- The surface of the base plate is Zi/Ni 12 % and the clock is electro-galvanised
- BRB is a captive mount whose design prevents the separation of the two metal parts, even in case of shock loads.
- Base plate marked with mount's type and hardness.

# **Application**

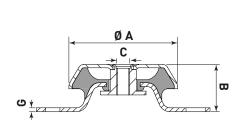
The product is suited to mobile and marine systems where high damping and good stability are required. The mount is also suitable for installations which are exposed to high wind loads, where it is very important that the mount is captive.

Pumps, compressors, marine systems, mobile units and fans.

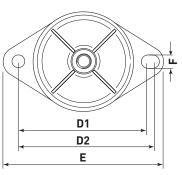


Type / Hardness	40 Sh(A) Max. load [kg]	50 Sh(A) Max. load [kg]	60 Sh(A) Max. load [kg]	70 Sh(A) Max. load [kg]	
BRB 45	12	18	25		
BRB / BRBX 50	20	40	60	80	
BRB / BRBX 60	30	45	65	75	
BRB 65	50	75	120	140	
BRB / BRBX 70	50	75	120	140	
BRB / BRBX 80	80	130	175	235	
BRB 95	150	260	330	390	
BRB / BRBX 110	200	305	420	450	
BRB 125	310	450	700	900	
BRB / BRBX 150	450	570	800	1000	
BRB / BRBX 180	875	1110	1700	2630	
BRB/ BRBX 220	1600	2400	3400	4200	

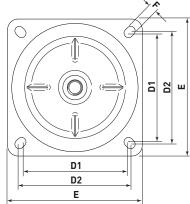
#### **ALSO IN STAINLESS STEEL AISI 304**



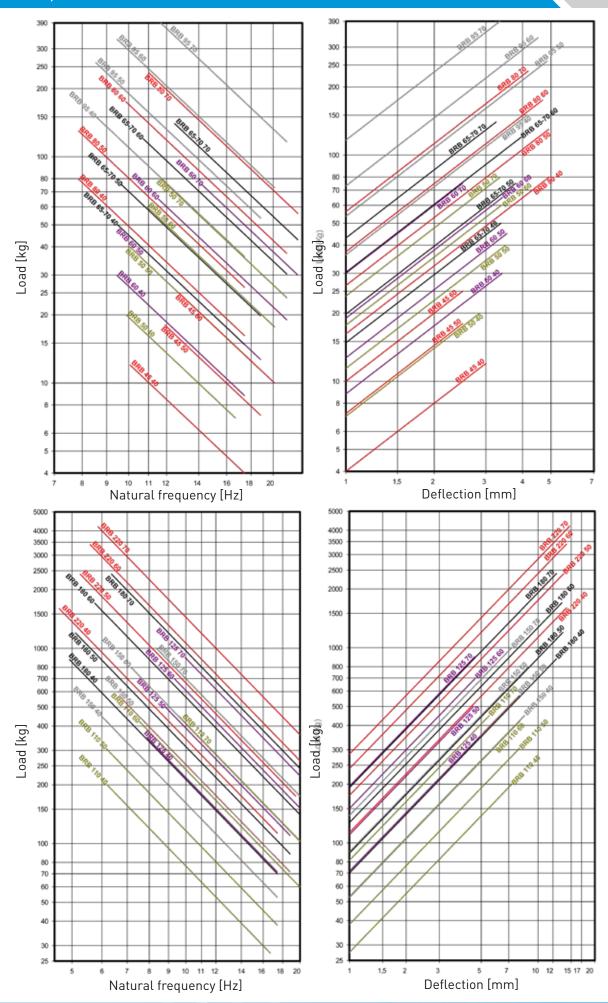
BRB045 BRB050 BRB060 BRB065 BRB070 BRB080 BRB110 BRB125 BRB150



BRB150 BRB180 BRB220



Туре	A Ø [mm]	B [mm]	С	D1 [mm]	D2 [mm]	E [mm]	F [mm]	G [mm]	Mount weight [g]
BRB 45	50	32	M8	61	70	85	6.5	2	131
BRB 50	50	25	M8	61	70	85	6.5	2	117
BRB 60	64	35	M10	76.5	90.5	110	9	2.5	225
BRB 65	64	35	M10/M12	76.5	90.5	110	9	2.5	243
BRB 70	65	35	M12	100	-	120	11	3	253
BRB 80	83	35	M10/M12	108	112	135	11	3	398
BRB 95	92	39	M10/M12	122	126.6	150	10	3	657
BRB 110	106	41	M12/M16	137	149	175	13	3	857
BRB 125	123	48	M16	154	162	190	14	4	1170
BRB 150	156	53.5	M16	176	188	218	14.5	4	1840
BRB 150 RECT	155	53.5	M16	125	132	164	14.5	4	2030
BRB 180	186	84	M20	146	150	181	14	5	3800
BRB 220	230	105	M24	180	-	220	19	6	6716



Captive mounts CML

## **Product description**

Captive anti-vibration mounts are designed with built-in overload protection, which controls the equipment during transport and provides complete protection in both stationary and mobile conditions.

A universal mount which is popular for use in a variety of applications. Effective mounts that are easy to install, at reasonable prices. The rubber is loaded in compression and shear and the CML type's low height creates a reasonable reduction in vibration with an overall low total height.

The steel cover protects from UV radiation and shields the rubber from any dripping oil or fuel.

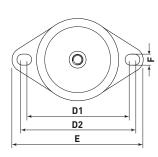
Loads from 125 kg to 5000 kg

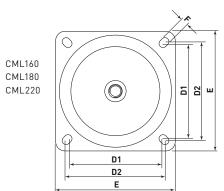
#### **Application**

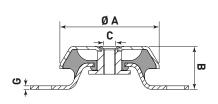
Diesel engines, generators, pumps, compressors, vehicles, marine engines, mobile installations, construction machines and fans.



CML060 CML080 CML095 CML110 CML125 CML150

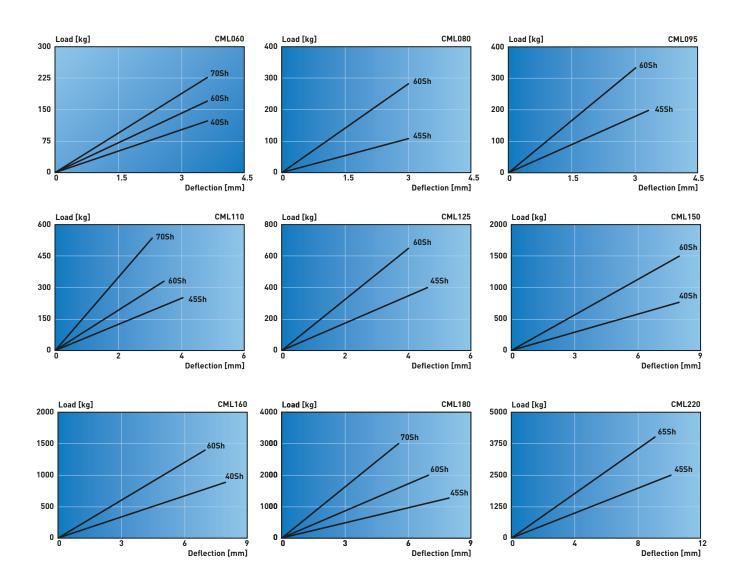






Туре	A Ø [mm]	B [mm]	С	D1 [mm]	D2 [mm]	E [mm]	F [mm]	G [mm]
CML060	63	35	M10-M12	76	90	110	9	2.5
CML080	77	30	M10-M12	108	110	135	15	3
CML095	93	35	M10-M12	122	124	144	10	2.5
CML110	106	38	M12-M16	138	146	171	12.5	3
CML125	121	42	M12-M16	156	158	190	13.5	3.3
CML150	155	48	M16	176	188	216	14	4
CML160	162	59	M20	-	140	170	14.5	4
CML180	180	66	M20	149	163	192	14.5	4
CML220	220	105	M24	-	180	220	17.5	6

**CML** 



	Hardness	s 40 Sh(A)	Hardness	45 Sh(A)	Hardness	60 Sh(A)	Hardness	65 Sh(A)	Hardness	5 70 Sh(A)
Туре	Max. load [kg]	Deflection [mm]								
CML060	125	3.5	-	-	175	3.5	-	-	225	3.5
CML080	-	-	110	3.0	280	3.0	-	-	-	-
CML095	-	-	200	3.5	320	3.0	-	-	-	-
CML110	-	-	250	4.0	325	3.5	-	-	520	3.0
CML125	-	-	400	4.5	650	4.0	-	-	-	-
CML150	750	8.0	-	-	1500	8.0	-	-	-	-
CML160	900	8.0	-	-	1400	7.0	-	-	-	-
CML180	-	-	1250	8.0	2000	7.0	-	-	3000	5.5
CML220	-	-	2500	10.0	-	-	4000	9.0	5000	7.0

#### **Product description**

The design of the BSB mount means that the rubber works in both shear and compression, which offers good stability as well as good vibration damping. The BSB mount is slightly shorter and is thus slightly more rigid than type BRB, and therefore isolates vibrations at slightly higher frequencies.

This range of mounts is used when the main priority is the installation height.

#### Technical properties

- Has been given the certificate: "Det Norske Veritas' Rules for Classification of Ships/High Speed and Light Craft"
- The steel upper part protects the rubber from dripping liquids, as well as UV light.
- The surface of the base plate is Zi/Ni 12 % and the clock is electro-galvanised
- BSB is a captive mount whose design prevents the separation of the two metal parts, even in case of shock loads.
- The base plate is marked with the mount type and hardness, making it easy to identify the product even after years of use.

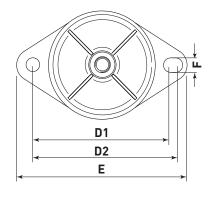
#### **Application**

The product is tailored to mobile and marine systems where high damping and stability are required. The BSB mount is also suitable for the isolation of axial and radial shock. The mount is also suitable for installations which are exposed to high wind loads, where it is very important that the mount is captive. The mount can also be used for the passive isolation of equipment which is near, or on, machines that vibrate a lot. This might be control or fuse boxes, for example, which must be vibration dampened and, at the same time, secured against falling down.

#### **Application**

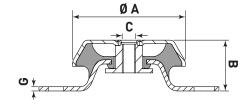
Pumps, compressors, marine systems, mobile units and fans.

BSB060 BSB080 BSB095 BSB110 BSB125 BSB150

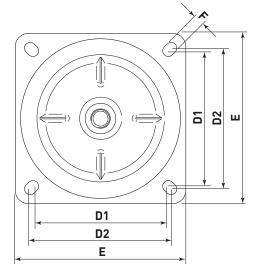


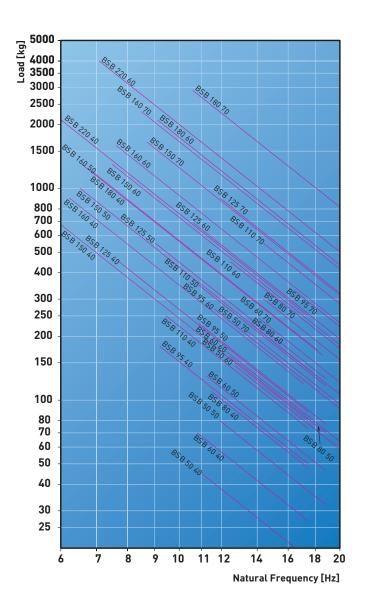


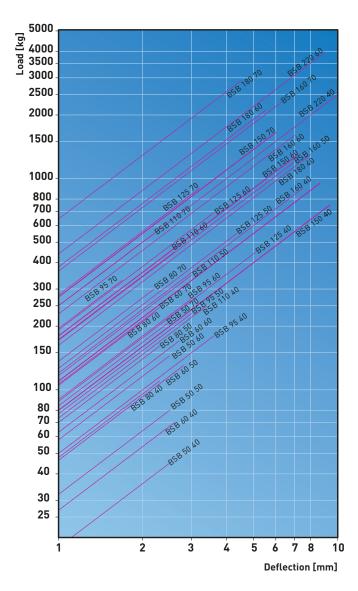
Туре	40 Sh(A) Max. load [kg]	50 Sh(A) Max. load [kg]	60 Sh(A) Max load [kg]	70 Sh(A) Max load [kg]
BSB060	70	130	170	245
BSB080	110	161	231	300
BSB095	<b>75</b> 180		270	330
BSB110	250	350	450	550
BSB125	450	550	690	900
BSB150	750	950	1300	1650
BSB160	900	1200	1600	2300
BSB180	1300	1750	2100	2900
BSB220	2500	3200	4000	5000



BSB150 BSB160 BSB180 BSB220







Туре	A Ø [mm]	B [mm]	С	D1 [mm]	D2 [mm]	E [mm]	F [mm]	G [mm]	Dead weight [g]
BSB060	64	34	M10	76.5	90.5	110	9	2.5	235
BSB080	78	31	M10/M12	108.2	111.2	130	9.2	3	355
BSB095	92	34	M10/M12	122	126.4	150	10	3	488
BSB110	106	37	M16/M12	137	150	175	13	3	785
BSB125	123	43	M16	154	162	190	14	4	1109
BSB150	156	49	M16	176	188	218	14.5	4	1818
BSB150 RECT	156	49	M16	125	132	164	14.5	4	2060
BSB160	156	57	M20	140	140	170	14.5	4	2200
BSB180	180	67	M20	149	163	192	14.5	4	3800
BSB220	230	105	M24	180	180	220	19	6	6716

# Captive anti-vibration mount

#### **Product description**

These armoured mounts are compact low-profile mountings. They are easy to install and combines 3-way control of movement with relatively large deflection in the elastomer. They combine maximum anti-shock isolation and optimum vibration control, and have been specially designed for mobile equipment applications.

The main characteristic of these isolators is to gradually increase stiffness under deflection, which prevents from any sudden bottoming.

The high-resistance steel centre bolt, mechanically joined to the outer cup, affords security against breakage. This design prevents swivelling and rotation.

#### **Application**

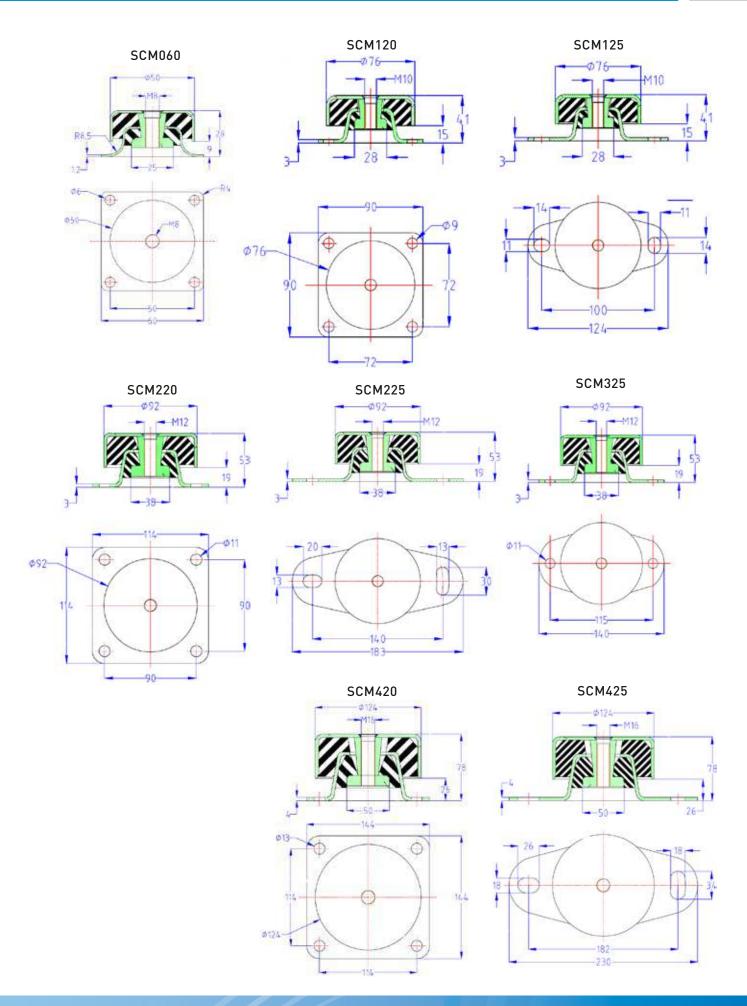
Natural rubber NR type of high quality with an operating temperature from -40°C to +70°C.

The VMQ elastomer provides the most efficient vibration damping and minimum transmissibility at resonance frequency. With an operating temperature range from  $-60^{\circ}$ C to  $+250^{\circ}$ C.

The product is tailored to mobile and marine systems where high damping and stability are required. Has the same stiffness vertically and horizontally.



	Hardness	35 Sh(A)	Hardness	45 Sh(A)	Hardness	60 Sh(A)	Hardness	75 Sh(A)
Туре	Max. Load [kg]	Deflection [mm]	Max. Load [kg]	Deflection [mm]	Max. Load [kg]	Deflection [mm]	Max. Load [kg]	Deflection [mm]
SCM060-NR	35	3 ± 0.5	60	3 ± 0.5	125	3 ± 0.5	200	3 ± 0.5
SCM060-WMQ			75	3 ± 0.5	100	3 ± 0.5	150	3 ± 0.5
SCM120/125-NR			80	3.5 ± 0.5	200	$3.5 \pm 0.5$	300	3.5 ± 0.5
SCM120/125-WMQ			80	3.5 ± 0.5	160	3.5 ± 0.5	250	3.5 ± 0.5
SCM220/225-NR	110	4.5 ± 0.5	170	4.5 ± 0.5	300	4.5 ± 0.5	450	4.5 ± 0.5
SCM220/225-WMQ			130	4.5 ± 0.5	220	4.5 ± 0.5	350	4.5 ± 0.5
SCM325-NR			120	4.5 ± 0.5	210	4.5 ± 0.5	330	4.5 ± 0.5
SCM325-WMQ			130	4.5 ± 0.5	220	4.5 ± 0.5	350	4.5 ± 0.5
SCM420/425-NR			350	6.5 ± 1.0	800	6.5 ± 1.0	1400	6.5 ± 1.0
SCM420/425-WMQ			350	6.5 ± 1.0	800	6.5 ± 1.0	1100	6.5 ± 1.0



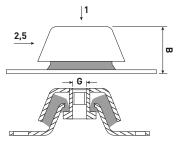
Marine mounts VS/VM/VB/VX

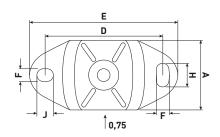
# **Product description**

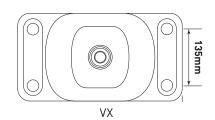
Marine mounts were originally developed for the installation of small marine engines and are designed to absorb screw pressure. The mounts therefore have different stiffnesses in the three load directions in order to optimise the reduction of the vibrations of small marine engines.

# **Application**

Small marine engines, ship-mounted installations, generators, mobile systems and the like.

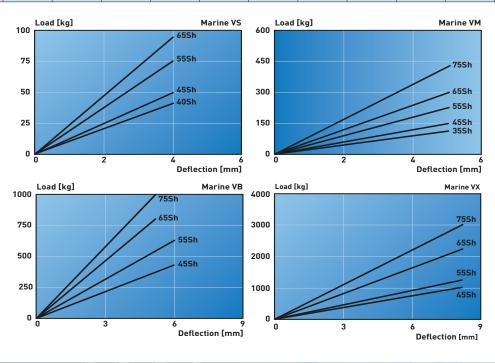






Туре	A [mm]	B [mm]	D [mm]	E [mm]	F [mm]	H [mm]	J [mm]	G
Marine VS	60	38.5	100	120	11	14	11	M12
Marine VM	75	50	140	183	13	30	20	M16
Marine VB	114	74	182	228	18	35	25	M20
Marine VX	190	112	270	330	18	18	18	M24

	Hardness 35 Sh(A)		Hardness 40 Sh(A)		Hardness 45 Sh(A)		Hardness 55 Sh(A)		Hardness 65 Sh(A)		Hardness 75 Sh(A)	
Туре	Max. load [kg]	Deflection [mm]										
Marine VS			40	4	50	4	75	4	90	4		
Marine VM	110	5			150	5	225	5	300	5	425	5
Marine VB			-	-	425	6	625	6	800	5	1000	5
Marine VX					1000	8	1300	8	2250	8	3000	8



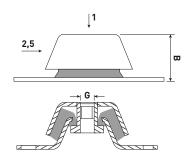
## **Product description**

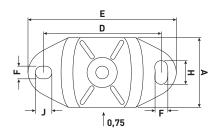
Marine mounts were originally developed for the installation of small marine engines and are therefore adapted to transfer thrust. The mounts therefore have different stiffnesses in the three load directions. In recent years, marine mounts have been popular to use in a wide range of other applications, so we now also offer them in acid-proof steel, AISI 316.

## **Application**

Small marine engines, other diesel engines and generators, vehicles, pumps and compressors. The mounts are also useful in corrosive environments such as offshore, agriculture and coastal plants.

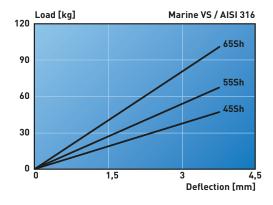


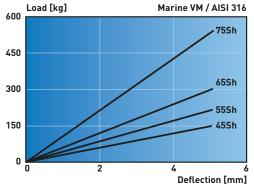




Туре	A [mm]	B [mm]	D [mm]	E [mm]	FxH [mm]	FxJ [mm]	G [mm]	Dead weight [g]
Marine VS AISI 316	60	40	100	120	11x14	11x14	M12	400
Marine VM AISI 316	75	50	140	183	13x20	13x20	M16	860

	Hardnes	Hardness 45 Sh(A)		Hardness 55 Sh(A)		65 Sh(A)	Hardness 75 Sh(A)	
Туре	Max. Load [kg]	Deflection [mm]	Max. load [kg]	Deflection [mm]	Max. load [kg]	Deflection [mm]	Max. load [kg]	Deflection [mm]
Marine VS	45	3.5	70	3.5	105	3.5		
Marine VM	150	5	225	5	300	5	500	5





# Captive anti-vibration mounts

#### **Product description**

CMA mounts have a design similar to CMH and CML. The advantage of this mount is that the rubber compound provides high internal damping.

This special rubber compound means the mount provides good vibration and stability to equipment with high-amplitude vibrations.

#### Technical properties

- The upper part protects the rubber from fuel and oil.
- The metal parts are electro-galvanised.
- The CMA mount is a secured mount whose design prevents the separation of the two metal parts, even in case of high shock loads

## **Application**

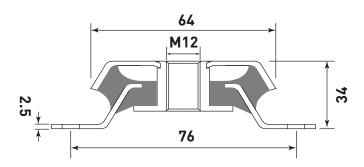
This mount is specially designed to isolate engines that produce high-amplitude vibrations.

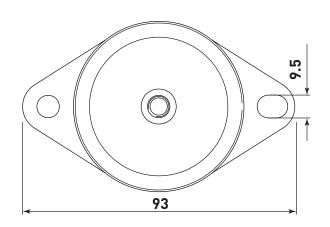
Engines with 1–3 cylinders, motor-driven pumps, generators, compressors, fans, etc.

These mounts are suitable for engines and machines that start and stop frequently. When it starts and stops the engine goes through the resonant frequency, amplifying the vibrations, which is why the CMA mount is made with a rubber compound with high internal damping. The CMA mount is also good under machines which have rpms near the system's resonance frequency.

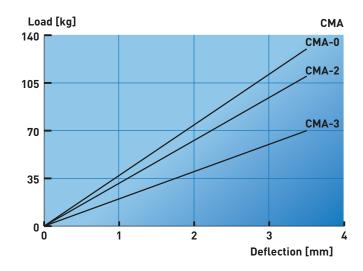
CMA mounts can advantageously be used for diesel engines with few cylinders, especially when the cylinder diameter is large and has a short stroke length. This often means that the engine generates high amplitude oscillations, and thus requires additional attenuation to stabilise.







	Dimer	nsions	Maximum load	Deflection
Туре	B [mm]	H [mm]	[kg]	[mm]
CMA-0	93	34	130	3.5
CMA-2	93	34	110	3.5
CMA-3	93	34	70	3.5



Chassis mounts CHM/TF

## **Product description**

The CHM mount consists of two rubber parts, wherein the centre of the unit contains a metal pipe in order to reduce wear on the rubber, resulting in a longer service life.

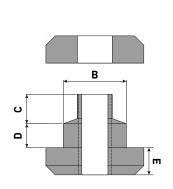
This vibration unit is ideal for use where there are large dynamic loads and where a high level of stability is required.

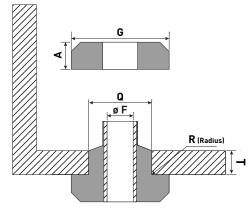
## **Application**

Machine houses, agricultural and forestry machines.



Hardness 45 Sh(A)





												Maximum	Deflection	Maximum	Deflection
Туре	A [mm]	W [mm]	C [mm]	D [mm]	E [mm]	Ø F [mm]	G [mm]	Q [mm]	T [mm]	T [mm]	R	load [kg]	[mm]	load [kg]	[mm]
CHM 30	12	20	10	9	12	10	33	20	9.5	9.5	1	40	2.0	70	2.5
CHM 50	20	31	19	10	20	14	47.5	31	14	13	2	75	3.7	125	3.5
CHM 65	23	40	24	15	23	17	64	39	22	19	3	115	4.0	250	4.0
CHM 90	25	58	27	22	25	24	89	57	28.6	25	3	250	7.0	440	6.0

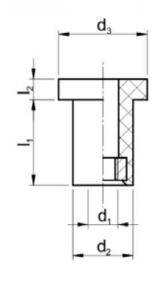
#### **Product description**

The TF rubber anchor consists of rubber bushing with a vulcanised thread. Suitable for holes with diameters such as d2. It is tightened by the threaded section being drawn toward the large flange

#### **Application**

For hanging equipment Machine houses, agricultural and forestry machines.

Туре	d2 [mm]	d3 [mm]	l1 [mm]	l2 [mm]	Thread d1
TF-1	6.6	9	9	3	М3
TF-2	8.5	12	12	3.2	M4
TF-3	10.2	15	14.5	3.5	M5
TF-4	12.7	18	17	4.3	М6
TF-5	16.0	24	22	5.3	M8





Hardness 60 Sh(A)

Chassis mounts SCH

#### **Product description**

The SCH mounts consist of two rubber parts, wherein one has a metal sleeve internally, reducing wear on the rubber and producing a longer service life.

## **Technical properties**

This vibration mount is ideal for large dynamic loads where high stability is required. This might be, for instance, in the drivers' cabs of many types of vehicle. Besides optimum stability, SCH offers good shock and vibration damping

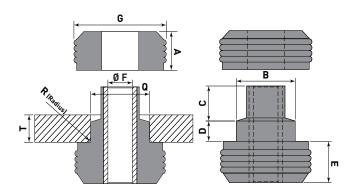
# **Application**

Machine houses, agricultural and forestry machinery.

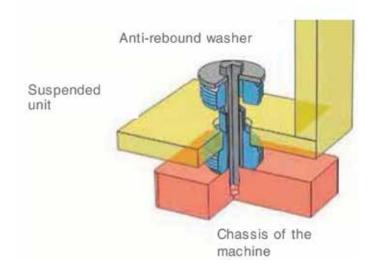
#### **Assembly instructions**

There are two assembly methods, please see "Assembly 1 & 2" at the bottom of the next page. SCH can be installed in plates of different thicknesses depending on the Tmax and Tmin values, which are listed in the table below. The mount's deflection curve will vary depending on the mounting plate's thickness.

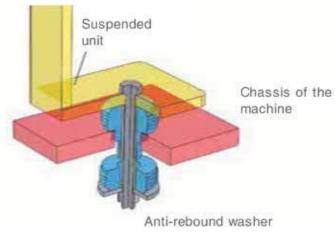




# Assembly 1

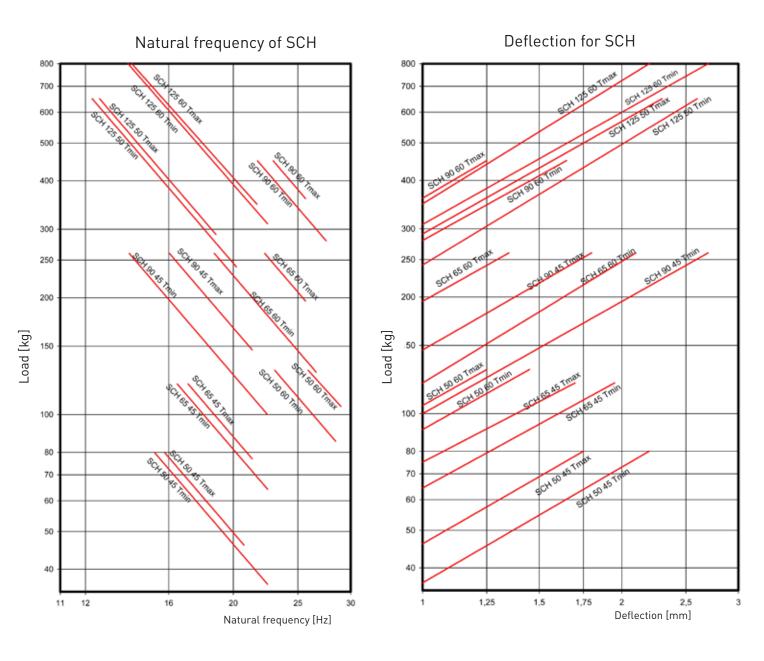


# - Assembly 2



Туре	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Ø F [mm]	G [mm]	Q [mm]	T [mm]	T [mm]	R	Mount weight [g]
SCH 50	20	31	19.5	10.5	20	13.5	49	30.5	14	12.5	1.5	153
SCH 65	23	39.5	24	15	23	17	63.5	38.5	22	19	2.5	350
SCH 90	25	58	31	17	25	23	88	57	29	25	3	675
SCH 125	32	65	33	22	32	27	126	64	32	25	3	1440

Chassis mounts SCH



	Hardness	45 Sh(A)	Hardness	50 Sh(A)	Hardness	60 Sh(A)	Hardness 75 Sh(A)	
Туре	Max. load [kg]	Deflection [mm]						
SCH 50	80	2.0			130	1.35	210	1.1
SCH 65	120	1.8			260	1.65		
SCH 90	260	2.3			450	1.4		
SCH 125			650	2.4	800	2.4		

Chassis mounts SCB

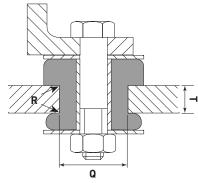
## **Product description**

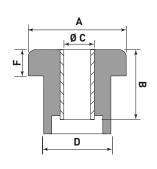
SCB mounts consist of a rubber centre with a metal pipe inside. The metal pipe reduces the wear of the rubber and extends the product's service life. The SCB mount is designed to absorb both tensile and compressive forces.

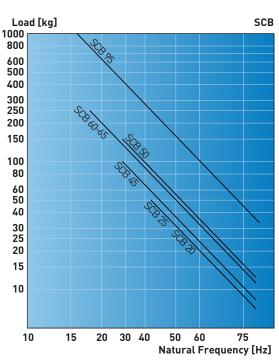
## **Advantages**

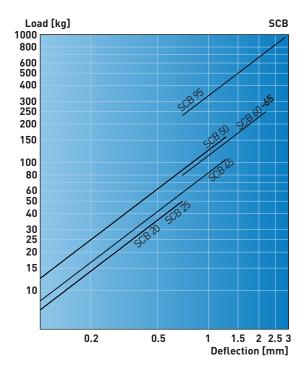
- Easy to assemble and install
- Simple and economical solution for many applications.











Туре	A [mm]	B [mm]	C Ø [mm]	D [mm]	F [mm]	R [mm]	Q [mm]	T Min. [mm]	T Max. [mm]	Load [kg]	Mount Weight [g]
SCB 20	27	15.5	10	20	6.5	1	20.5	4	5	30	20
SCB 25	27	21	10	20	6.5	1	20.5	10	11	50	20
SCB 45	42	25	13	31	10.5	1.5	31	10	11	100	56
SCB 50	49	35	13.5	34	13.5	1.5	34	16	17	200	73
SCB 60	63	31	16	41	16	3	41	9	10	250	108
SCB 65	62	44.5	16.5	40	17	3	40	19	20	250	140
SCB 95	92	51.5	20.5	56	26	3	55.5	19	20	1000	395

Washers for each can be ordered as a spare part. Please contact IAC Acoustics for further information.



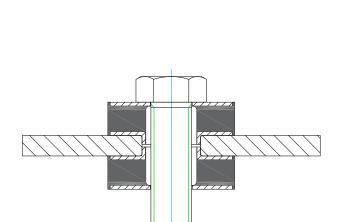
Ring puffer RP

## **Product description**

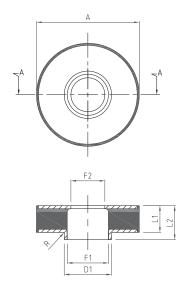
The ring puffer has rubber which is vulcanised to a steel washer and a flanged steel washer. This provides flexible and secure installation of the machinery. The mount provides good prevention of the installation short-circuiting, which means that the bolt which is installed through the mount does not stick out and touch the steel plates.

## **Application**

Can also be used for the passive isolation of equipment which is to be mounted on walls, such as electrical cabinets, monitors, etc. Used very widely in the industry.







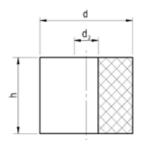
Туре	Hardness [IRHD]	A [mm]	D1 [mm]	F1 [mm]	F2 [mm]	L1 [mm]	L2 [mm]	R [mm]	Stiffness [kg/mm]	Max. load [kg]	Max. deflection [mm]	Mount Weight [g]
	45								90	81	0.9	
RP361016	60	36	20	16.5	16.5	8	10.5	0.5	150	135	0.9	20
	70								230	207	0.9	
	45								70	84	1.2	
RP361408	60	36	18	12	8.5	10	14	0.5	110	132	1.2	35
	70								170	204	1.2	
	45								80	120	1.5	
RP502216	60	50	23	20	16.5	13	22.5	1	140	210	1.5	65
	70								210	315	1.5	
	45								110	209	1.9	
RP601720	60	60	27	24	20.5	13	17	1.5	210	399	1.9	85
	70								310	589	1.9	
	45								110	209	1.9	
RP602320	60	60	27	24	20.5	13	23.5	1.5	210	399	1.9	85
	70								310	589	1.9	
RP603421	60	60	27	24	21	30	34	1.5	70	245	3.5	130

# Rubber washer

# **Product description**

Rubber washer with or without a steel insert. The standard version is in natural rubber and electro-galvanised steel. Can also be ordered as follows:

- Rubber hardness: 45, 55 & 70 Sh(A)
- Rubber type CR, EPDM & Silicone, etc.
- The rubber can be stained
- AISI 316



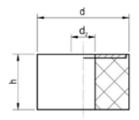


GS rubber washer

	al	h	d2			
Туре	d [mm]	h [mm]	[mm]	GS	GS1	GS2
GS 008003-03	8	3.5	3.2	*		
GS 010008-04	10	8	4.3	*		
GS 013012-06	13	12	6.5	*		
GS 015012-06	15	12	6.5	*	*	
GS 015015-06	15	15	6.5	*	*	
GS 015020-06	15	20	6.5	*	*	
GS 015025-06	15	25	6.5	*	*	*
GS 017016-09	17.5	16	9	*		
GS 019019-13	19	19	13	*		
GS 020015-08	20	15	8.5	*	*	
GS 020020-08	20	20	8.5	*	*	
GS 020025-06	20	25	6			*
GS 020025-08	20	25	8.5	*	*	
GS 020030-08	20	30	8.5	*	*	
GS 020040-08	20	40	8.5	*	*	
GS 025015-10	25	15	10.5	*		
GS 025020-06	25	20	6.6			*
GS 025020-10	25	20	10.5	*	*	
GS 025025-10	25	25	10.5	*	*	
GS 025030-10	25	30	10.5	*	*	
GS 025040-10	25	40	10.5	*	*	
GS 028016-08	28	16	8	*		
GS 028050-10	28	50	10.5	*		
GS 030015-16	30	15	16			*
GS 030030-13	30	30	13.5	*	*	
GS 030040-13	30	40	13.5	*	*	
GS 030050-13	30	50	13.5	*	*	
GS 032032-13	32	32	13.5	*		
GS 035015-19	35	15	19			*
GS 035020-13	35	20	13			*
GS 040009-17	40	9	17.5			*
GS 040010-10	40	10	10		*	
GS 040020-13	40	20	13			*
GS 040025-12	40	25	12	*		
GS 040030-01	40	30	0.9	*		
GS 040030-13	40	30	13.5	*	*	*

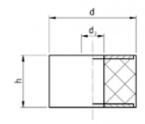
	[mm]	[mm]	[mm]	GS	GS1	GS2
GS 040030-17	40	30	17	*		
GS 040032-13	40	32	13.5	*		
GS 040035-12	40	35	12	*		
GS 040040-13	40	40	13.5	*	*	*
GS 040040-16	40	40	16	*		
GS 040050-13	40	50	13.5	*	*	
GS 040060-13	40	60	13.5	*	*	
GS 040065-12	40	65	12	*		
GS 047050-20	47	50	20	*		
GS 048100-17	48	100	17	*		
GS 050013-16	50	13	16.5			*
GS 050015-21	50	15	21			*
GS 050020-17	50	20	17			*
GS 050025-11	50	25	11			*
GS 050025-13	50	25	13			*
GS 050025-17	50	25	17	*		
GS 050030-10	50	30	10			*
GS 050030-17	50	30	17			*
GS 050030-21	50	30	21			*
GS 050032-17	50	32	17	*		
GS 050038-20	50	38	20	*		
GS 050040-17	50	40	17	*	*	*
GS 050045-10	50	45	10	*		
GS 050050-17	50	50	17	*	*	*
GS 050050-24	50	50	24	*		
GS 050050-25	50	50	24.8	*		
GS 050060-17	50	60	17	*	*	
GS 050063-17	50	63	17	*		
GS 050080-14	50	80	14	*		
GS 050080-17	50	80	17	*	*	
GS 053100-32	53	100	32.5	*		
GS 058100-17	58	100	17	*		
GS 060013-20	60	13	20.5			*
GS 060030-10	60	30	10.5			*
GS 060030-17	60	30	17	*	*	
GS 060030-18	60	30	18			*

Rubber washer GS/GS1/GS2





GS1 rubber washer with 1 steel insert





GS2 rubber washer with 2 steel inserts

Type         [mm]         [mm]         [mm]         GS           GS 060030-21         60         30         21         21           GS 060040-20         60         40         17         *           GS 060050-17         60         50         17         *           GS 060050-21         60         50         21         *           GS 062006-14         62         6         14         *           GS 075030-25         75         30         25         *           GS 075040-18         75         40         18         *           GS 080027-20         80         27         20         *           GS 080030-21         80         30         21         *           GS 080030-30         80         35         30         *           GS 080040-20         80         40         20         *           GS 080040-21         80         40         21         *           GS 080050-21         80         50         21         *           GS 080080-21         80         60         21         *           GS 080080-21         80         80         21         * <th>* * *</th> <th>* *</th>	* * *	* *
GS 060040-17         60         40         17         *           GS 060040-20         60         40         20         *           GS 060050-17         60         50         17         *           GS 060050-21         60         50         21         *           GS 062006-14         62         6         14         *           GS 075030-25         75         30         25         *           GS 075040-18         75         40         18         *           GS 080027-20         80         27         20         *           GS 080030-21         80         30         21         *           GS 080035-30         80         35         30         *           GS 080040-20         80         40         20         *           GS 080040-21         80         40         21         *           GS 080050-15         80         50         15         *           GS 080060-21         80         60         21         *	*	
GS 060040-20 60 40 20 * GS 060050-17 60 50 17 * GS 060050-21 60 50 21 GS 060060-17 60 60 17 * GS 062006-14 62 6 14 GS 070040-40 70 40 40 * GS 075030-25 75 30 25 GS 075040-18 75 40 18 * GS 075055-25 75 55 25 GS 080027-20 80 27 20 * GS 080030-21 80 30 21 * GS 080030-30 80 35 30 * GS 080040-20 80 40 20 * GS 080040-21 80 50 15 * GS 080050-21 80 50 21 * GS 080050-21 80 50 21 * GS 080050-21 80 50 21 *	*	*
GS 060050-17         60         50         17         *           GS 060050-21         60         50         21         *           GS 060060-17         60         60         17         *           GS 062006-14         62         6         14         *           GS 075030-25         75         30         25         *           GS 075040-18         75         40         18         *           GS 075055-25         75         55         25         *           GS 080027-20         80         27         20         *           GS 080030-21         80         30         21         *           GS 080030-40         80         30         40         *           GS 080040-20         80         40         20         *           GS 080040-21         80         40         21         *           GS 080050-15         80         50         15         *           GS 080060-21         80         60         21         *	*	*
GS 060050-17       60       50       21         GS 060060-17       60       60       17       *         GS 062006-14       62       6       14         GS 070040-40       70       40       40       *         GS 075030-25       75       30       25         GS 075055-25       75       55       25         GS 080027-20       80       27       20       *         GS 080030-21       80       30       21       *         GS 080035-30       80       35       30       *         GS 080040-20       80       40       20       *         GS 080040-21       80       40       21       *         GS 080050-15       80       50       15       *         GS 080060-21       80       60       21       *	*	*
GS 060060-17         60         60         17         *           GS 062006-14         62         6         14         *           GS 070040-40         70         40         40         *           GS 075030-25         75         30         25         *           GS 075040-18         75         40         18         *           GS 075055-25         75         55         25         *           GS 080027-20         80         27         20         *           GS 080030-21         80         30         21         *           GS 080030-40         80         30         40         *           GS 080035-30         80         35         30         *           GS 080040-20         80         40         20         *           GS 080040-21         80         40         21         *           GS 080050-15         80         50         15         *           GS 080060-21         80         60         21         *		*
GS 062006-14       62       6       14         GS 070040-40       70       40       40       *         GS 075030-25       75       30       25         GS 075040-18       75       40       18       *         GS 075055-25       75       55       25       *         GS 080027-20       80       27       20       *         GS 080030-21       80       30       21       *         GS 080035-30       80       35       30       *         GS 080040-20       80       40       20       *         GS 080040-21       80       40       21       *         GS 080050-15       80       50       15       *         GS 080060-21       80       60       21       *		
GS 070040-40         70         40         40         *           GS 075030-25         75         30         25           GS 075040-18         75         40         18         *           GS 075055-25         75         55         25         *           GS 080027-20         80         27         20         *           GS 080030-21         80         30         21         *           GS 080035-30         80         35         30         *           GS 080040-20         80         40         20         *           GS 080040-21         80         40         21         *           GS 080050-15         80         50         15         *           GS 080050-21         80         60         21         *	*	
GS 075030-25 75 30 25 GS 075040-18 75 40 18 * GS 075055-25 75 55 25 GS 080027-20 80 27 20 * GS 080030-21 80 30 21 * GS 080035-30 80 35 30 * GS 080040-20 80 40 20 * GS 080040-21 80 40 21 * GS 080050-15 80 50 15 * GS 080050-21 80 60 21 *		
GS 075040-18         75         40         18         *           GS 075055-25         75         55         25           GS 080027-20         80         27         20         *           GS 080030-21         80         30         21         *           GS 080030-40         80         30         40         *           GS 080035-30         80         35         30         *           GS 080040-20         80         40         20         *           GS 080040-21         80         40         21         *           GS 080040-25         80         40         25         *           GS 080050-15         80         50         15         *           GS 080060-21         80         60         21         *		
GS 075055-25		*
GS 080027-20         80         27         20         *           GS 080030-21         80         30         21         *           GS 080030-40         80         30         40         *           GS 080035-30         80         35         30         *           GS 080040-20         80         40         20         *           GS 080040-21         80         40         21         *           GS 080040-25         80         40         25         *           GS 080050-15         80         50         15         *           GS 080050-21         80         50         21         *           GS 080060-21         80         60         21         *		
GS 080030-21     80     30     21     *       GS 080030-40     80     30     40     *       GS 080035-30     80     35     30     *       GS 080040-20     80     40     20     *       GS 080040-21     80     40     21     *       GS 080040-25     80     40     25     *       GS 080050-15     80     50     15     *       GS 080050-21     80     60     21     *		*
GS 080030-21     80     30     40     *       GS 080035-30     80     35     30     *       GS 080040-20     80     40     20     *       GS 080040-21     80     40     21     *       GS 080040-25     80     40     25     *       GS 080050-15     80     50     15     *       GS 080050-21     80     50     21     *       GS 080060-21     80     60     21     *		
GS 080035-30     80     35     30     *       GS 080040-20     80     40     20     *       GS 080040-21     80     40     21     *       GS 080040-25     80     40     25     *       GS 080050-15     80     50     15     *       GS 080050-21     80     50     21     *       GS 080060-21     80     60     21     *	*	*
GS 080040-20 80 40 20 * GS 080040-21 80 40 21 * GS 080040-25 80 40 25 * GS 080050-15 80 50 15 * GS 080050-21 80 60 21 *		
GS 080040-20 80 40 21 * GS 080040-25 80 40 25 * GS 080050-15 80 50 15 * GS 080050-21 80 60 21 *		
GS 080040-21     80     40     21       GS 080040-25     80     40     25     *       GS 080050-15     80     50     15     *       GS 080050-21     80     50     21     *       GS 080060-21     80     60     21     *		
GS 080050-15 80 50 15 * GS 080050-21 80 50 21 * GS 080060-21 80 60 21 *	*	
GS 080050-21 80 50 21 * GS 080060-21 80 60 21 *		
GS 080060-21 80 60 21 *		
03 080080-21 80 80 21	*	
<b>GS 080080-21</b> 80 80 21 *	*	
	*	
<b>GS 080082-25</b> 80 82 25 *		
<b>GS 080100-21</b> 80 100 21 *		
<b>GS 090045-30</b> 90 45 30 *		
<b>GS 100019-56</b> 100 19 56	*	
<b>GS 100030-21</b> 100 30 21 *	*	
<b>GS 100030-60</b> 100 30 60	*	
<b>GS 100035-30</b> 100 35 30 *		-
<b>GS 100040-21</b> 100 40 21 *	*	*
<b>GS 100040-25</b> 100 40 25 *	*	
<b>GS 100040-26</b> 100 40 26 *		
<b>GS 100040-31</b> 100 40 31		*
<b>GS 100040-33</b> 100 40 33 *		
<b>GS 100040-70</b> 100 40 70 *		

Туре	d [mm]	h [mm]	d2 [mm]	GS	GS1	GS2
GS 100050-21	100	50	21	*	*	
GS 100060-21	100	60	21	*	*	*
GS 100070-25	100	70	25	*		
GS 100070-40	100	70	40	*		
GS 100075-33	100	75	33	*	*	*
GS 100080-21	100	80	21	*	*	
GS 100100-21	100	100	21	*	*	
GS 120030-21	120	30	21		*	
GS 120040-25	120	40	25	*	*	
GS 120040-40	120	40	40	*		
GS 120040-41	120	40	41			*
GS 120040-50	120	40	50	*		
GS 120040-51	120	40	51			*
GS 125080-35	125	80	35			*
GS 125125-35	125	125	35	*		*
GS 125125-50	125	125	50	*		
GS 150040-32	150	40	32		*	
GS 150100-51	150	100	51	*		*
GS 150180-45	150	180	45	*		
GS 160160-33	160	160	33	*		
GS 200100-32	200	100	32			*
GS 200100-61	200	100	61	*		*
GS 200200-33	200	200	33	*		
GS 250200-60	250	200	60	*		

# Flexible bushes (flexible bearings)

## **Product description**

VP Flexible Bush consists of two concentric steel tubes with a rubber layer in-between which is vulcanised to both tubes.

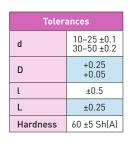
#### **Application**

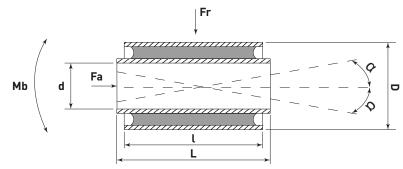
The flexible bush can advantageously be used as bearings in oscillating constructions or machine parts which must be flexible in relation to each other.

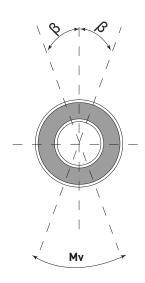
Since the rubber can absorb the movement, the bearing does not need lubrication or other regular maintenance. The bush also has good noise and vibration-isolating properties which make the construction quiet and vibration-free.

Examples of uses are linkages in cars, railway wagons, tractors, farm machinery, vibrators and many others









	Radi	al load	Axia	ıl load		Torsion			Bending		Dir	nensi	ons [m	m]
Туре	Max. Fr [kg]	Stiffness [kg/mm]	Max. Fa [kg]	Stiffness [kg/mm]	Max. Mv [Nm]	Max ß [degree]	Stiffness [Nm/degree]	Max. Mb [Nm]	Max a [grad]	Stiffness [Nm/degree]	d	D	L	ι
VP10/2525	230	200	75	17	5	15	0.3	6	8	0.7	10	25	25	20
VP10/2540	380	235	150	38	6	15	0.4	38	8	4.8	10	25	40	35
VP15/3530	350	300	150	22	9	15	0.6	12	8	1.5	15	35	30	25
VP15/3550*	600	650	250	52	15	15	1.0	120	8	15.0	15	35	30	25
VP20/4540	680	400	260	33	24	15	1.6	45	8	5.6	20	45	40	35
VP20/4575	1350	800	550	82	48	15	3.2	365	8	46.0	20	45	75	70
VP25/5045	900	450	380	45	46	14	3.3	96	8	12.0	25	50	45	40
VP25/5085	1800	1050	750	96	69	14	4.9	730	8	92.0	25	50	85	80
VP30/6055	1200	500	510	53	78	14	5.6	135	8	17.0	30	60	55	45
VP35/6560*	1600	850	660	72	93	12	7.7	180	6	23.0	35	65	60	50
VP35/65110*	3150	2940	1300	155	200	11	17.0	1560	6	260.0	35	65	110	100
VPP40/7065	1800	1800	750	90	115	10	11.5	205	5	41	40	70	65	55
VPP40/70120	3500	37800	1600	1800	198	9	22	1680	4	420	40	70	120	110
VP45/7570*	2400	2000	1000	110	240	12	20.0	320	7	45.0	45	75	70	60
VPP45/75130	3500	4200	1800	215	272	8	34	4200	5	840	45	75	130	120
VP50/8075	2850	3000	1200	135	275	11	25.0	700	7	100.0	50	80	75	65

<sup>\*</sup>Order goods

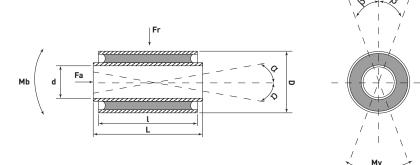
# **Product description**

The VPP Flexible Bush is like the VP bush, with a rubber layer which is vulcanised to the two concentric tubes. Its usage is the same as for VP.

Galvanised steel FE 360



Tolerances									
	8 to 15 mm	-0/+0.15							
d	16 to 25 mm	-0/+0.3							
	26 to 50 mm	-0/+0.4							
	16 to 30 mm	-0/+0.1							
D	31 to 70 mm	-0/+0.15							
	71 to 100 mm	-0/+0.2							
Stiffness	±20 %								



		D	imensi	ons (mn	n]	Radia	l load	Axial	load	Torsi	ion	Bendi	ng
Туре	Hardness Sh(A)	d	D	L	ι	Stiffness [kg/mm]	Max. deflection [mm]	Stiffness [kg/mm]	Max. deflection [mm]	Stiffness [Nm/degree]	Max ß [degree]	Stiffness [Nm/degree]	Max ɑ [degree]
VPP08.2/3223	65	8.2	32	23	18	29	1.4	8	1.0	0.19	35	0.08	6
VPP09.5/2022	65	9.5	20.6	22.2	19	217	0.5	23	0.7	0.27	25	0.53	6
VPP10/2217	65	10	22	17	15	207	0.5	22	0.5	0.32	25	0.31	6
VPP10/2541	55	10	25	41	35	1483	0.5	104	1.4	1.75	20	13.76	3
VPP10/3240	65	10	32	20	15	32	1.1	9	1.0	0.24	30	0.05	7
VPP10/3230	55	10	32	30	24	350	1.1	35	1.0	0.70	20	3.50	3
VPP12/2528	55	12	25	28	25	764	0.5	67	0.7	1.22	20	3.52	3
VPP12/3034	55	12	30	34	34	425	0.8	55	0.1	1.36	30	3.98	7
VPP12/3044	55	12	30	44	34	425	0.8	55	2.1	1.36	30	3.98	3
VPP12/3040	55	12	30	40	36	414	0.9	55	0.8	1.42	30	4.40	3
VPP12/3441	55	12	34	41	35	249	1.1	43	1.4	1.32	20	2.61	3
VPP12/5062	65	12	50	62	50	102	2.3	24	2.7	1.45	30	2.44	7
VPP12.5/7466	55	12.5	74.5	66	45	126	3.4	35	4.4	2.83	30	1.52	7
VPP13/3040	65	13	30	40	40	396	0.8	44	0.8	1.13	30	5.12	3
VPP14.5/7466	55	14.5	74.5	66	45	126	3.4	35	4.2	4.69	30	2.51	7
VPP16/3872	65	16	38	72	64	2070	0.7	127	1.6	4.90	20	67	1
VPP16/5082	55	16	50	82	60	390	1.9	68	4.5	4.43	20	12.90	3
VPP16/5147	65	16	51	47.5	38	102	2.0	23	2.0	1.65	30	1.35	7
VPP16/5153	65	16	51	53.8	44.3	128	2.0	27	2.1	1.94	30	2.31	7
VPP17/3838	55	17	38	38	33	449	1.1	60	1.2	2.63	25	3.98	3
VPP18/5772	65	18	57	72	60	159	2.4	34	2.4	3.01	30	5.51	7
VPP18/5786	55	18	57	86	70	393	2.3	73	3.3	6.72	30	17.94	7
VPP28/6669	65	28	66	69	55	234	2.1	43	2.8	5.86	20	6.43	3
VPP38/8290	65	38	82	90	70	720	2.1	89	2.8	20.40	15	30.32	1
VPP40/8290	65	40	82	90	70	732	1.1	90	4.0	20.46	15	30.80	1

# Flexible bushes (flexible bearings)

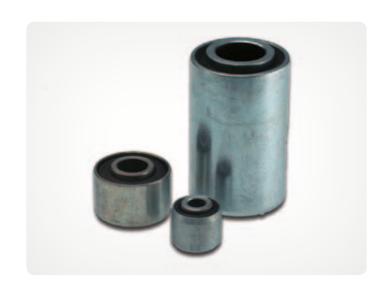
## **Product description**

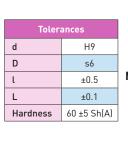
Flexible bush consisting of two concentric galvanised steel tubes, between which a rubber layer is pressed.

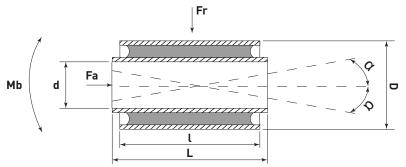
## **Application**

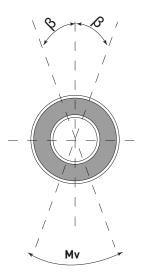
The flexible bush can advantageously be used as bearings in oscillating constructions or machine parts which must be flexible in relation to each other. Since the rubber absorbs the movement, the bearing does not requires lubrication or any other regular maintenance. The bush also has good noise and vibration-isolating properties which make the construction quiet and vibration-free.

Examples of uses are linkages in cars, railway wagons, tractors, farm machinery, vibrators and many others









	Radia	l load	Axial load		Tor	sion	Ben	ding		Dimensi	on [mm]	
Туре	Max. Fr (kg)	Stiffness (kg/mm)	Max. Fr (kg)	Stiffness (kg/mm)	Max Mv (Nm)	Max ß (degree)	Max Mb (Nm)	Max a (degree)	d	D	L	ι
GE1676	11	0.4	5	0.9	1.0	28	2.0	6	6	16	14	12
GE1462	35	0.3	25	1.0	3.5	21	4.9	2	8	16	20	18
GE1652	53	0.3	41	1.1	4.4	21	1.0	2	8	16	28	25
GE1457	95	0.3	68	1.5	9.8	18	9.8	2	10	22	33	30
GE2000	31	0.5	16	1.5	2.9	28	5.9	6	10	25	18	15
GE2104	87	0.3	80	1.5	9.8	22	8.8	4	10	25	28	25
GE1751	55	0.2	39	1.5	9.8	20	5.9	3	12	25	23	20
GE1917	125	0.1	103	1.5	16.7	20	29.4	2	12	25	38	35
GE1223B	230	0.3	284	2.5	31.4	20	61.8	2	14	27	54	50
GE2054	120	0.2	108	2.0	24.5	17	29.4	3	16	32	32	28
GE2117	300	0.3	265	2.0	45.1	17	107.9	2	16	32	54	50

CONE **Conical mounts** 

## **Product description**

In conical mounts, the rubber works in shear and compression.

The mounts consist of two parallel conical metal parts. There are two washers, one of which is the buffer and the other of which is for centring.

#### **Technical properties**

Conical mounts are secure and stable elements, as equipment which is mounted on them cannot fall over. Moreover, they are flexible enough to dampen the transmission of vibrations through the structure.

The mounts come with stop and centring washers. This means that a deflection exceeding the mount's limits is impossible, even under extreme loads.

The washer protects the rubber against ozone and aging, as well as against any blows from metal or dripping oil.

The characteristic deflection curves on the mounts which are mounted with centring washers are guite linear and increase progressively the heavier the load is. Therefore, they can dampen an overload of up to three times the maximum recommended load.

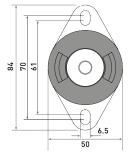
## **Application**

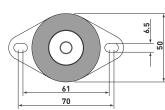
Conical mounts are specially designed for use in mobile plant and machines such as drivers' cabs, engines, suspension arms, etc.



Type 00 Cone

Ø8.2

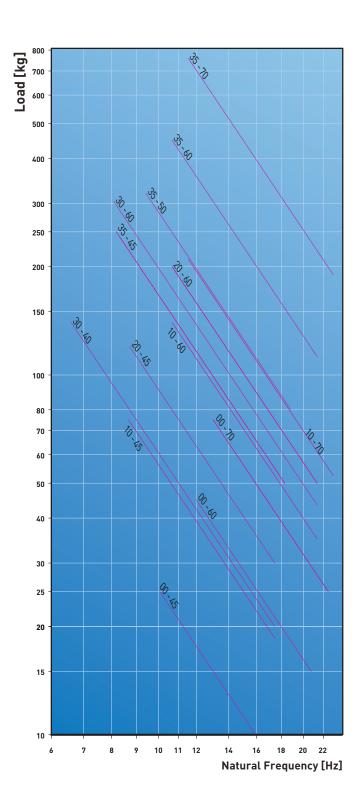


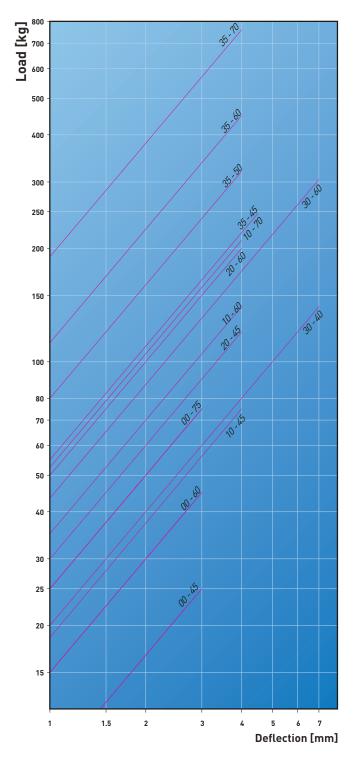


Type 01 Cone

Туре	Load [kg] 40 Sh(A)	Load [kg] 45 Sh(A)	Load [kg] 50 Sh(A)	Load [kg] 60 Sh(A)	Load [kg] 70 Sh(A)	Weight [g]
Cone 00	-	25	-	50	75	126
Cone 01	-	40	-	70	105	128
Cone 02	-	50	-	90	-	132
Cone 10	-	75	-	140	210	406
Cone 11	-	100	-	180	270	409
Cone 20	-	120	-	200	-	554
Cone 21	-	180	-	300	-	560
Cone 30	140	-	300	-	-	1167
Cone 31	-	-	310	500	960	1188
Cone 35	-	200	320	450	760	1328
Cone 36	-	400	-	700	1100	1410
Cone 40	-	420	-	690	1080	1216
Cone 60	-	900	-	1250	1560	1821
Cone 70	-	1000	-	2100	2500	3450

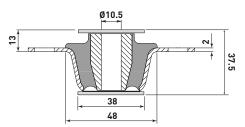
Conical mounts CONE



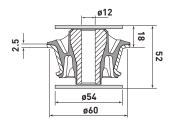


Conical mounts CONE

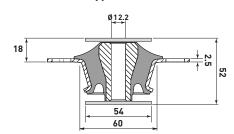
Type 02 Cone

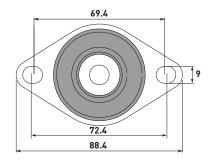


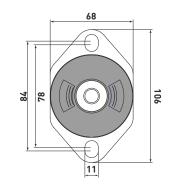
Type 10 Cone



Type 11 Cone

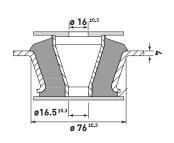




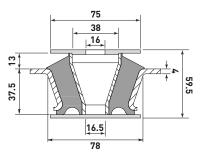


78 84 106

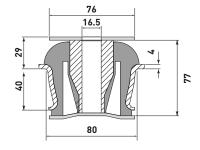
Type 20 Cone

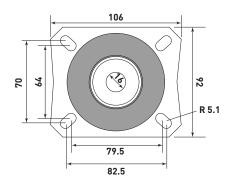


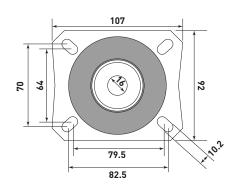
Type 21 Cone



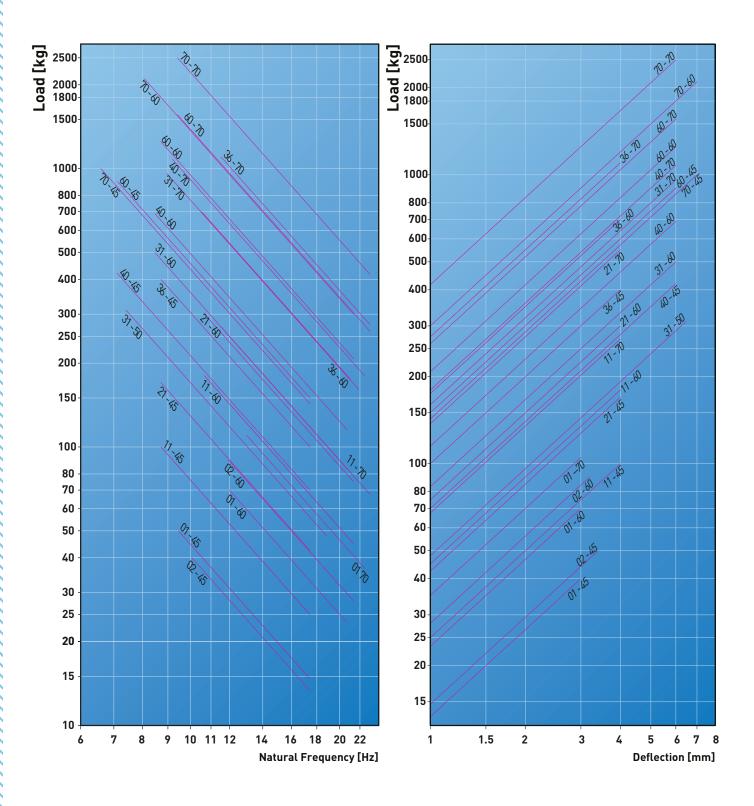
Type 30 Cone





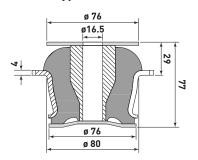


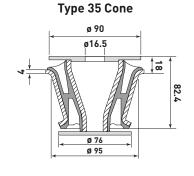
92 70 64 85.1 901

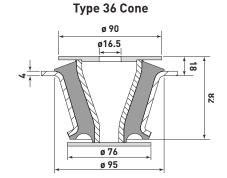


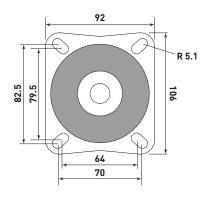
CONE **Conical mounts** 

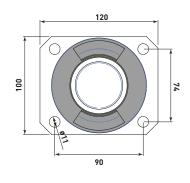
Type 31 Cone

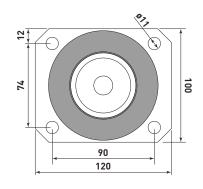




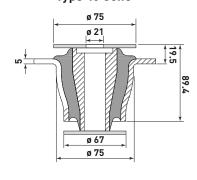


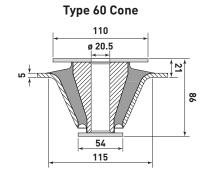


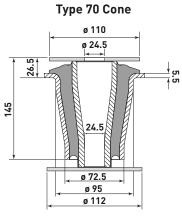


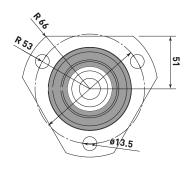


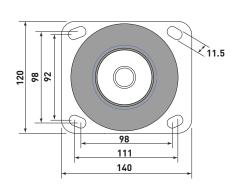
Type 40 Cone

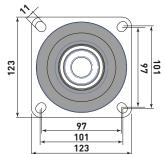












Conical mounts AT

## **Product description**

The AT mount is specially designed to isolate against medium to high frequencies. The rubber is bonded to two concentric tubular metal parts. The inner metal part is a cylindrical tube. The outer metal part is also tubular and has a flange with mounting holes.

## **Assembly and operation**

When assembling, we recommend using a washer at the top and bottom so that there is equal pressure on the upper part and the assembly bolt cannot be pulled up through the mount in case of shock loads.

The AT mount has a radial elasticity which is one quarter of its axial elasticity.

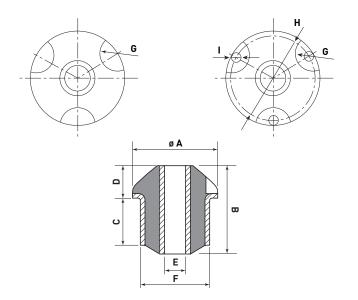
## **Application**

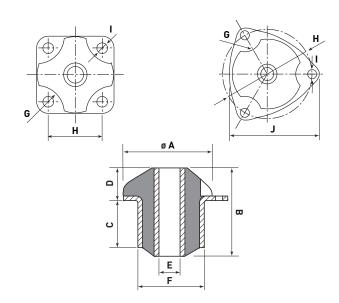
AT mounts can advantageously be used for the vibration isolation of machines where there is low installation height and the machinery requires high radial stability relative to the mount. Machines such as reciprocating compressors, mechanical presses, electrical transformers, removable drives, machines on concrete buttresses, etc.

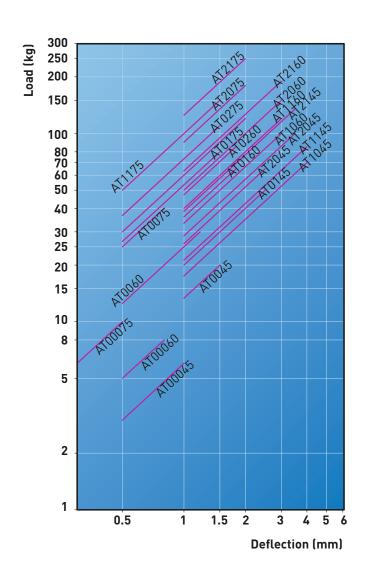


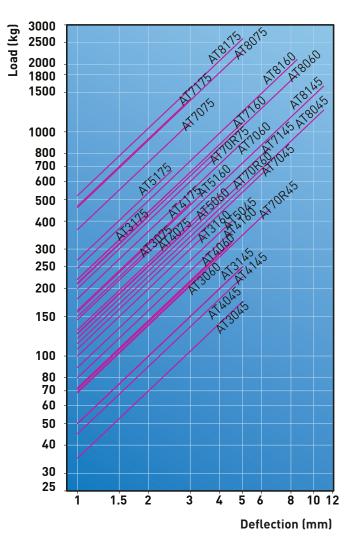
Туре	A Ø [mm]	B [mm]	C [mm]	D [mm]	EØ [mm]	FØ [mm]	G [mm]	H Ø [mm]	IØ [mm]	J [mm]	Fig.	Load 45 Sh(A) [kg]	Load 60 Sh(A) [kg]	Load 75 Sh(A) [kg]	Weight [g]
AT 000	25	11	3	7	6.2	20	4	19	3.2	-	3	6	8	10	-
AT 00	36	28	12.5	11.5	8.1	26	12	26	5.2	-	3	20	30	40	39
AT 01	48	40	18	18	12.1	37.5	8	-	-	-	1	50	65	80	-
AT 02	48	51	24	18	12.1	37.5	8	-	-	-	1	65	85	110	144
AT 10	60	47	20	18	12.2	49	8	69	8.2	73	4	70	100	120	-
AT 11	60	60	31	18	12.2	49	8	69	8.2	73	4	85	120	150	250
AT 20	70	55	27	19	18.2	55.7	10	-	-	-	1	100	150	180	344
AT 21 (Round)	70	70	39	19	18.2	55.7	10	-	-	-	1	135	190	250	437
AT 21 (Tri.)	70	70	39	19	18.2	55.7	10	80	8.5	86	4	-	-	-	437
AT 30	90	75	29	28	20.2	65	16	78	8.5	-	2	175	240	300	522
AT 31 (Round)	90	95	47	28	20.2	65	-	-	-	-	1	250	350	420	775
AT 31 (Tri.)	90	95	47	28	20.2	65	16	95	8.5	-	4	250	350	420	775
AT 40 (Tri.)	100	90	42	28	22.2	74	18	100	8.5	112	1-4	225	320	380	789
AT 41	100	110	49	28	22.2	74	18	100	8.5	112	1-4	250	360	480	895
AT 50	120	100	47	33	40.2	86	20	114	8.5	-	4	325	440	550	1305
AT 51	120	120	63	53	40.2	86	20	114	10.5	-	2	400	550	670	1494
AT 70 (Round)	165	98	36	46	60.2	118	22	145	10.5	-	2	450	600	800	3124
AT 70	165	140	66	46	60.2	118	22	145	10.5	-	2	700	900	1100	3124
AT 71	165	170	96	46	60.2	118	22	145	10.5	-	2	850	1100	1400	3790
AT 80	230	167	95	53	80	170	30	204	12.2	-	2	1250	1800	2300	7096
AT 81	230	185	113	53	80	170	30	204	12.2	-	2	1600	2100	2600	7702

Conical mounts AT









# **Housed Spring Mount**

# **Product description**

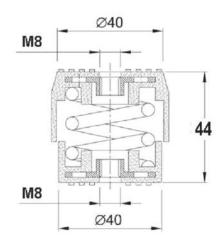
Designed for vibration isolation of smaller machines with a speed of more than 600 rpm. Can handle loads from 3–50 kg. M8 centre threaded and non-slip top and bottom, where the spring is protected from the weather.

## **Application**

Especially suitable for Genvex units, heat pumps, small fans and air conditioning systems.







Туре	Mount weight [kg]	Stiffness [kg/mm]	Max. load [kg]	Deflection [mm]	Height [mm]
FDHL-05	0.07	0.4	5	13	44
FDHL-09	0.07	0.7	9	12	44
FDHL-12	0.07	1.0	12	12	44
FDHL-20	0.08	1.7	20	12	44
FDHL-26	0.08	2.3	26	11	44
FDHL-30	0.09	3.0	30	10	44
FDHL-40	0.09	4.0	40	10	44
FDHL-50	0.09	5.5	50	9	44

# **Housed Spring Mount**

# **Product description**

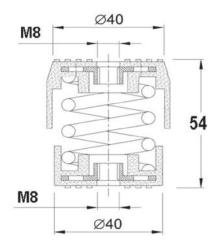
Designed for vibration isolation of smaller machines with a speed of more than 450 rpm. Can handle loads from 3 to 130 kg. M8 centre threaded and non-slip top and bottom, where the spring is protected from the weather.

# **Application**

Especially suitable for Genvex units, heat pumps, small fans and air conditioning systems.









Туре	Mount weight [kg]	Stiffness [kg/mm]	Max. load [kg]	Deflection [mm]	Height [mm]
FDHH-009	0.06	0.4	9	22	54
FDHH-015	0.07	0.7	15	22	54
FDHH-019	0.07	1.0	19	19	54
FDHH-034	0.07	1.7	34	20	54
FDHH-035	0.08	2.3	35	15	54
FDHH-045	0.08	3.0	45	15	54
FDHH-056	0.10	4.6	56	12	54
FDHH-084	0.10	6.0	84	14	54
FDHH-101	0.10	7.2	101	14	54
FDHH-108	0.14	9.0	108	12	54
FDHH-127	0.11	10.6	127	12	54
FDHH-130	0.12	13.0	130	10	54

# **Housed Spring Mount**

## **Product description**

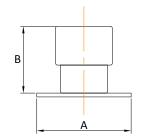
Steel spring in a house constructed for vibration isolation of machines at a speed of more than 450 rpm.

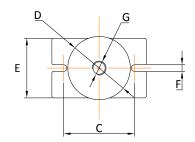
An oil-resistant and slip-resistant rubber sheet is adhered to the bottom of the mount in order to dampen the higher natural frequencies in the spring.

The mounts can also be ordered with springs with up to 50 mm deflection – call us if you would like to know more.

#### **Application**

Suitable for mounting in places where the spring must be protected from weathering. Used, for instance, in Genvex units, heat pumps, fans, air conditioners and cooling towers.





Туре	A [mm]	B [mm]	c [mm]	D [mm]	E [mm]	F [mm]	G [mm]
ESS	75	73	59	55	40	10	M8
ESM	150	79	120	105	100	10	M12
ESL	230	80	200	175	150	12	M12

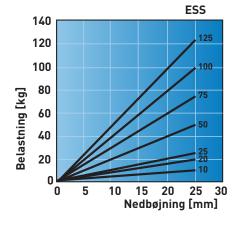
#### **Assembly**

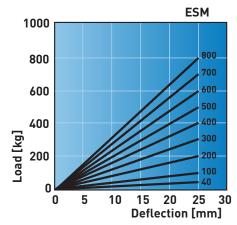
Suitable for mounting in places where the spring must be protected from weathering. Used, for instance, in Genvex units, heat pumps, fans, air conditioners and cooling towers.

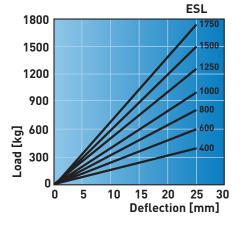












## **Product description**

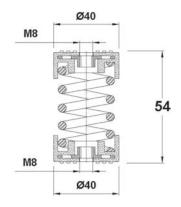
Open steel spring with mounting plates designed for vibration isolation of machines with speeds of more than 400 rpm.

An oil-resistant and slip-resistant rubber sheet is adhered to the bottom and the top of the mount in order to dampen the higher natural frequencies in the spring. Also available with a threaded pin in one or both ends.

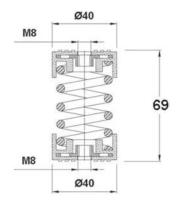
## **Application**

Used, for instance, in Genvex units, heat pumps, fans, air conditioners and cooling towers.

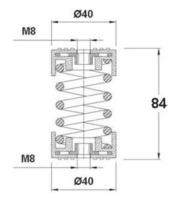












Туре	Mount weight [g]	Stiffness [kg/mm]	Load [kg]	Deflection [mm]	Height [mm]
FD04054-009	0.08		9	22	54
FD04069-012	0.09	0.4	12	31	69
FD04084-014	0.11		14	34	84
FD04054-015	0.08		15	22	54
FD04069-017	0.10	0.7	17	24	69
FD04084-025	0.11		25	36	84
FD04054-019	0.09		19	19	54
FD04069-026	0.10	1.0	26	26	69
FD04084-036	0.11		36	36	84
FD04054-034	0.09		34	20	54
FD04069-039	0.11	1.7	39	23	69
FD04084-044	0.15		44	26	84
FD04054-035	0.10	2.3	35	15	54
FD04069-060	0.12	2.5	60	24	69
FD04084-065	0.15	2.5	65	26	84
FD04054-045	0.10		45	15	54
FD04069-069	0.12	3.0	69	23	69
FD04084-084	0.14		84	28	84
FD04069-078	0.13	3.7	78	21	69
FD04084-096	0.16	3.7	96	26	84
FD04054-056	0.11		56	12	54
FD04069-092	0.13	4.6	92	20	69
FD04084-106	0.16		106	23	84
FD04054-084	0.11		84	14	54
FD04069-108	0.13	6.0	108	18	69
FD04084-144	0.17		144	24	84
FD04054-101	0.12		101	14	54
FD04069-130	0.15	7.2	130	18	69
FD04084-166	0.18		166	23	84
FD04054-108	0.15		108	12	54
FD04069-144	0.16	9.0	144	16	69
FD04084-189	0.20		189	21	84
FD04054-127	0.13		127	12	54
FD04069-170	0.15	10.6	170	16	69
FD04084-202	0.20		202	19	84
FD04069-180	0.16	12.0	180	15	69
FD04084-216	0.22		216	18	84
FD04054-130	0.14	13.0	130	10	54
FD04069-196	0.17	14.0	196	14	69
FD04084-238	0.23		238	17	84
FD04069-224	0.18	16.0	224	14	69
FD04084-288	0.21		288	18	84
FD04069-234	0.18	18.0	234	13	69

# Spring mounts, open

## **Product description**

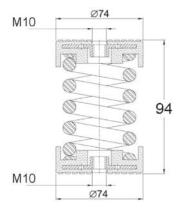
Open steel spring with mounting plates designed for vibration isolation of machines with speeds of more than 350 rpm.

An oil-resistant and slip-resistant rubber sheet is adhered to the bottom and the top of the mount in order to dampen the higher natural frequencies in the spring. Also available with a threaded pin in one or both ends.

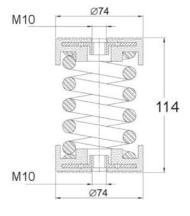
## **Application**

Used, for instance, in Genvex units, heat pumps, fans, air conditioners and cooling towers.

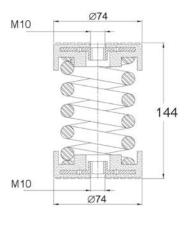












Type						
FD07414-024	Туре			Load [kg]		
FD07414-024	FD074094-020			20		
FD074094-037   0.29   1.0	FD074114-024	0.31	0.5	24	47	114
FD07414-044   0.34   1.0   44   44   114   FD074094-059   0.30   59   37   94   94   97   96   97   97   98   97   98   97   98   98	FD074144-028	0.40		28	55	144
FD074144-051   0.46   51   51   144     FD074094-059   0.30   59   37   94     FD074114-043   0.36   1.6   69   43   114     FD074094-067   0.38   67   32   94     FD074114-084   0.39   2.1   84   40   114     FD074094-092   0.33   92   33   94     FD074114-101   0.43   2.8   101   36   114     FD074094-092   0.36   105   27   94     FD074114-132   0.61   132   47   144     FD074094-105   0.36   105   27   94     FD074114-133   0.47   3.9   133   34   114     FD074094-135   0.39   135   27   94     FD074014-136   0.50   5.0   160   32   114     FD074094-136   0.43   158   25   94     FD074114-183   0.55   6.3   183   29   114     FD074094-188   0.45   7.5   240   32   114     FD074144-240   0.54   7.5   240   32   114     FD074144-240   0.54   7.5   240   32   114     FD074144-346   0.80   346   36   144     FD074094-218   0.60   11.8   271   23   114     FD074144-346   0.80   346   36   144     FD074094-248   0.50   248   21   94     FD074144-251   0.60   11.8   271   23   114     FD074144-469   0.76   469   35   144     FD074094-347   0.55   330   22   94     FD074114-281   0.66   13.4   281   21   114     FD074094-347   0.55   306   17   94     FD07414-4-60   0.77   16.5   380   23   114     FD074094-340   0.57   16.5   380   23   114     FD07414-4-66   0.76   469   35   144     FD074094-340   0.57   16.5   380   23   114     FD07414-4-66   0.57   16.5   380   23   114     FD07414-4-66   0.76   469   35   144     FD074094-380   0.53   390   22   94     FD074114-380   0.72   16.5   380   23   114     FD07414-4-66   1.16   468   26   144     FD074094-380   0.53   390   29   44     FD074094-380   0.53   390   29   44     FD07414-4-60   1.06   500   420   21   114     FD07414-4-60   1.06   500   360   16   94     FD07414-4-60   1.06   520   26   144     FD07414-4-60	FD074094-037	0.29		37	37	94
FD074094-059   0.30   1.6   69   43   114     FD074144-077   0.55   77   48   144     FD074094-067   0.38   67   32   94     FD07414-097   0.55   97   46   144     FD074094-092   0.33   92   33   94     FD07414-101   0.43   2.8   101   36   114     FD074094-015   0.36   105   27   94     FD074094-015   0.36   105   27   94     FD074094-105   0.36   105   27   94     FD074094-105   0.36   105   27   94     FD074094-105   0.39   133   34   114     FD074094-105   0.39   135   27   94     FD074144-160   0.50   5.0   160   32   114     FD074094-180   0.43   158   25   94     FD07414-183   0.55   6.3   183   29   114     FD074094-188   0.45   188   25   94     FD07414-240   0.54   7.5   240   32   114     FD074094-188   0.45   188   25   94     FD07414-240   0.54   7.5   240   32   114     FD074094-221   0.67   9.6   221   23   94     FD07414-36   0.80   7.5   240   32   114     FD074094-221   0.67   9.6   221   23   114     FD07414-346   0.80   188   271   23   114     FD07414-240   0.77   401   34   144     FD074094-268   0.52   268   20   94     FD074114-281   0.66   13.4   281   21   114     FD074094-330   0.53   330   22   94     FD074114-315   0.60   15.0   315   21   114     FD074144-366   0.80   15.0   315   21   114     FD074094-37   0.55   16.5   380   23   114     FD074094-390   0.57   16.5   380   23   114     FD074144-366   0.60   15.0   315   21   114     FD074144-468   0.77   401   34   144     FD074094-390   0.57   306   17   94     FD074114-390   0.67   18.0   396   22   114     FD074144-468   1.16   468   26   144     FD074094-380   0.53   380   19   94     FD074144-690   0.64   600   600   600   600   600   600   600     FD074094-300   0.53   380   19   94     FD074144-690   0.64   600   60	FD074114-044	0.34	1.0	44	44	114
FD07414-043	FD074144-051	0.46		51	51	144
FD074144-077   0.55   77	FD074094-059	0.30		59	37	94
FD074094-067   0.38	FD074114-043	0.36	1.6	69	43	114
FD074144-084   0.39	FD074144-077	0.55		77	48	144
FD074144-097   0.55   97	FD074094-067	0.38		67	32	94
FD074094-092   0.33   2.8   101   36   114   114   114   115   114   115   114   115   114   115   114   115   114   115   114   115   114   115   114   115   114   115   114   115   114   115   114   115   114   115   115   114   115   115   115   114   115   1	FD074114-084	0.39	2.1	84	40	114
FD07414-101	FD074144-097	0.55		97	46	144
FD074144-132   0.61   132   47	FD074094-092	0.33		92	33	94
FD074094-105   0.36   105   27   94     FD074144-133   0.47   3.9   133   34   114     FD074094-135   0.39   135   27   94     FD07414-160   0.50   5.0   160   32   114     FD07414-210   0.61   210   42   144     FD074094-158   0.43   158   25   94     FD07414-265   0.66   265   42   144     FD074094-188   0.45   188   25   94     FD07414-240   0.54   7.5   240   32   114     FD074094-188   0.45   7.5   240   32   114     FD074094-221   0.47   221   23   94     FD07414-240   0.65   9.6   221   23   114     FD07414-240   0.65   9.6   221   23   114     FD074094-221   0.47   221   23   94     FD07414-346   0.80   346   36   144     FD074094-248   0.50   11.8   271   23   114     FD074094-268   0.52   268   20   94     FD07414-281   0.66   13.4   281   21   114     FD074094-330   0.53   330   22   94     FD07414-315   0.60   15.0   315   21   114     FD074094-347   0.55   347   21   94     FD074094-347   0.55   347   21   94     FD07414-396   0.67   18.0   396   22   114     FD07414-408   1.16   468   26   144     FD074094-360   0.57   507414-469   0.75   16.5   380   23   114     FD07414-408   1.16   468   26   144     FD074094-360   0.57   18.0   396   22   114     FD07414-450   1.06   550   26   144     FD07414-450   0.53   380   19   94     FD07414-450   0.60   360   16   94     FD07414-450   0.60   360   16   94     FD07414-450   0.64   400   16   94     FD07414-450   0.64   400   16   94     FD07414-450   0.64   400   16   94     FD07414-630   1.06   630   28   144     FD07414-630   1.06   630   28   144     FD074094-360   0.60   360   16   94     FD07414-630   1.06   630   28   144     FD07414-630   1.06   630	FD074114-101	0.43	2.8	101	36	114
FD074114-133   0.47   3.9   133   34   114   FD074144-168   0.57   168   43   144   FD074094-135   0.39   135   27   94   FD07414-210   0.61   210   42   144   FD074094-158   0.43   158   25   94   FD074114-183   0.55   6.3   183   29   114   FD074094-188   0.45   FD074144-240   0.54   7.5   240   32   114   FD074094-21   0.47   FD07414-241   0.73   241   37   144   FD074094-21   0.47   FD07414-246   0.80   346   36   144   FD074094-248   0.50   248   21   94   FD07414-241   0.77   401   34   144   FD074094-268   0.52   FD07414-281   0.66   13.4   281   21   114   FD07414-315   0.60   15.0   315   21   114   FD074144-360   0.59   469   35   144   FD07414-315   0.60   15.0   315   21   114   FD07414-310   0.77   FD07414-310   0.77   16.5   380   23   114   FD074094-347   0.55   707414-360   0.57   FD07414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.57   707414-360   0.50   7075144-468   0.60   7075144-468   0.60   7075144-468   0.60   7075144-468	FD074144-132	0.61		132	47	144
FD074144-168         0.57         168         43         144           FD074094-135         0.39         135         27         94           FD074114-160         0.50         5.0         160         32         114           FD074144-210         0.61         210         42         144           FD074094-158         0.43         158         25         94           FD07414-265         0.66         265         42         144           FD074094-188         0.45         188         25         94           FD07414-240         0.54         7.5         240         32         114           FD07414-241         0.73         241         37         144           FD074094-221         0.47         221         23         94           FD07414-346         0.80         346         36         144           FD074094-248         0.50         248         21         94           FD07414-271         0.60         11.8         271         23         114           FD07414-281         0.66         13.4         281         21         114           FD07414-281         0.66         13.4         281	FD074094-105	0.36		105	27	94
FD074094-135         0.39         135         27         94           FD074114-160         0.50         5.0         160         32         114           FD074144-210         0.61         210         42         144           FD074094-158         0.43         158         25         94           FD07414-265         0.66         265         42         144           FD074094-188         0.45         188         25         94           FD07414-240         0.54         7.5         240         32         114           FD07414-241         0.73         241         37         144           FD074094-221         0.47         221         23         94           FD07414-221         0.65         9.6         221         23         114           FD07414-244         0.80         346         36         144           FD07414-248         0.50         248         21         94           FD07414-271         0.60         11.8         271         23         114           FD07414-281         0.66         13.4         281         21         114           FD07414-281         0.66         15.0	FD074114-133	0.47	3.9	133	34	114
FD074114-160         0.50         5.0         160         32         114           FD074144-210         0.61         210         42         144           FD074094-158         0.43         158         25         94           FD074114-183         0.55         6.3         183         29         114           FD074094-188         0.45         265         42         144           FD074114-240         0.54         7.5         240         32         114           FD07414-241         0.73         241         37         144           FD074094-221         0.47         221         23         94           FD07414-221         0.65         9.6         221         23         114           FD07414-244         0.80         346         36         144           FD07414-248         0.50         248         21         94           FD07414-271         0.60         11.8         271         23         114           FD074094-268         0.52         268         20         94           FD07414-281         0.66         13.4         281         21         114           FD07414-305         0.60	FD074144-168	0.57		168	43	144
FD074144-210         0.61         210         42         144           FD074094-158         0.43         158         25         94           FD074114-183         0.55         6.3         183         29         114           FD07414-265         0.66         265         42         144           FD074094-188         0.45         188         25         94           FD07414-240         0.54         7.5         240         32         114           FD07414-241         0.73         241         37         144           FD074094-221         0.47         221         23         94           FD07414-221         0.65         9.6         221         23         114           FD07414-346         0.80         346         36         144           FD07414-271         0.60         11.8         271         23         114           FD07494-288         0.52         268         20         94           FD07414-281         0.66         13.4         281         21         114           FD07414-300         0.53         330         22         94           FD07414-510         1.06         510	FD074094-135	0.39		135	27	94
FD074094-158         0.43         158         25         94           FD074114-183         0.55         6.3         183         29         114           FD074144-265         0.66         265         42         144           FD074094-188         0.45         188         25         94           FD074114-240         0.54         7.5         240         32         114           FD074144-241         0.73         241         37         144           FD074094-221         0.47         221         23         94           FD07414-346         0.80         346         36         144           FD07414-346         0.80         346         36         144           FD07414-340         0.70         248         21         94           FD07414-401         0.77         401         34         144           FD074994-268         0.52         268         20         94           FD07414-281         0.66         13.4         281         21         114           FD07414-30         0.53         330         22         94           FD07414-510         1.06         510         315         21         <	FD074114-160	0.50	5.0	160	32	114
FD074114-183         0.55         6.3         183         29         114           FD074094-188         0.45         265         42         144           FD074114-240         0.54         7.5         240         32         114           FD074144-241         0.73         241         37         144           FD074094-221         0.47         221         23         94           FD074114-221         0.65         9.6         221         23         114           FD07414-346         0.80         346         36         144           FD07414-346         0.80         248         21         94           FD07414-346         0.80         248         21         94           FD07414-271         0.60         11.8         271         23         114           FD07414-281         0.60         13.4         281         21         114           FD07414-281         0.66         13.4         281         21         114           FD07414-315         0.60         15.0         315         21         114           FD07414-315         0.60         15.0         315         21         14	FD074144-210	0.61		210	42	144
FD074144-265         0.66         265         42         144           FD074094-188         0.45         188         25         94           FD074114-240         0.54         7.5         240         32         114           FD074144-241         0.73         241         37         144           FD074094-221         0.47         221         23         94           FD074114-221         0.65         9.6         221         23         114           FD074144-346         0.80         346         36         144           FD074144-346         0.80         248         21         94           FD074144-346         0.80         346         36         144           FD074094-248         0.50         248         21         94           FD074144-401         0.77         401         34         144           FD074094-268         0.52         268         20         94           FD07414-281         0.66         13.4         281         21         114           FD07414-4-69         0.76         469         35         144           FD07414-315         0.60         15.0         315         21	FD074094-158	0.43		158	25	94
FD074094-188         0.45         188         25         94           FD074114-240         0.54         7.5         240         32         114           FD074144-241         0.73         241         37         144           FD074094-221         0.47         221         23         94           FD074114-221         0.65         9.6         221         23         114           FD07414-346         0.80         346         36         144           FD074094-248         0.50         248         21         94           FD074114-271         0.60         11.8         271         23         114           FD074144-401         0.77         401         34         144           FD074144-401         0.77         401         34         144           FD07414-281         0.66         13.4         281         21         114           FD07414-3930         0.53         330         22         94           FD07414-315         0.60         15.0         315         21         114           FD07414-310         1.06         510         34         144           FD07414-380         0.72         16.5	FD074114-183	0.55	6.3	183	29	114
FD074114-240         0.54         7.5         240         32         114           FD074144-241         0.73         241         37         144           FD074094-221         0.47         221         23         94           FD074114-221         0.65         9.6         221         23         114           FD074144-346         0.80         346         36         144           FD074094-248         0.50         248         21         94           FD074114-271         0.60         11.8         271         23         114           FD074144-401         0.77         401         34         144           FD074144-401         0.77         401         34         144           FD074094-268         0.52         268         20         94           FD07414-281         0.66         13.4         281         21         114           FD07414-4-69         0.76         469         35         144           FD07414-315         0.60         15.0         315         21         114           FD07414-315         0.60         15.0         315         21         114           FD07414-320         0.75 <th>FD074144-265</th> <th>0.66</th> <th></th> <th>265</th> <th>42</th> <th>144</th>	FD074144-265	0.66		265	42	144
FD074144-241         0.73         241         37         144           FD074094-221         0.47         221         23         94           FD074114-221         0.65         9.6         221         23         114           FD074144-346         0.80         346         36         144           FD074094-248         0.50         248         21         94           FD074114-271         0.60         11.8         271         23         114           FD074144-401         0.77         401         34         144           FD074094-268         0.52         268         20         94           FD074114-281         0.66         13.4         281         21         114           FD074144-469         0.76         469         35         144           FD074144-330         0.53         330         22         94           FD074144-315         0.60         15.0         315         21         114           FD074144-310         1.06         510         34         144           FD074144-380         0.72         16.5         380         23         114           FD074144-462         0.99         462<	FD074094-188	0.45		188	25	94
FD074094-221         0.47         221         23         94           FD074114-221         0.65         9.6         221         23         114           FD074144-346         0.80         346         36         144           FD074094-248         0.50         248         21         94           FD074114-271         0.60         11.8         271         23         114           FD074144-401         0.77         401         34         144           FD074094-268         0.52         268         20         94           FD074144-281         0.66         13.4         281         21         114           FD074144-301         0.53         330         22         94           FD074114-315         0.60         15.0         315         21         114           FD07414-315         0.60         15.0         315         21         114           FD07414-310         1.06         510         34         144           FD07414-380         0.72         16.5         380         23         114           FD07414-396         0.67         18.0         396         22         114           FD07414-468	FD074114-240	0.54	7.5	240	32	114
FD074114-221         0.65         9.6         221         23         114           FD074144-346         0.80         346         36         144           FD074094-248         0.50         248         21         94           FD074114-271         0.60         11.8         271         23         114           FD074144-401         0.77         401         34         144           FD074094-268         0.52         268         20         94           FD074114-281         0.66         13.4         281         21         114           FD074144-469         0.76         469         35         144           FD074094-330         0.53         330         22         94           FD074144-315         0.60         15.0         315         21         114           FD074144-510         1.06         510         34         144           FD074144-510         1.06         510         34         144           FD074144-620         0.99         462         28         144           FD074144-620         0.99         462         28         144           FD074144-688         1.16         468         26 </th <th>FD074144-241</th> <th>0.73</th> <th></th> <th>241</th> <th>37</th> <th>144</th>	FD074144-241	0.73		241	37	144
FD074144-346         0.80         346         36         144           FD074094-248         0.50         248         21         94           FD074114-271         0.60         11.8         271         23         114           FD074144-401         0.77         401         34         144           FD074094-268         0.52         268         20         94           FD074114-281         0.66         13.4         281         21         114           FD07414-469         0.76         469         35         144           FD074094-330         0.53         330         22         94           FD07414-315         0.60         15.0         315         21         114           FD07414-510         1.06         510         34         144           FD074094-347         0.55         347         21         94           FD07414-380         0.72         16.5         380         23         114           FD07414-462         0.99         462         28         144           FD07414-396         0.67         18.0         396         22         114           FD074094-380         0.53         380	FD074094-221	0.47		221	23	94
FD074094-248         0.50         248         21         94           FD074114-271         0.60         11.8         271         23         114           FD074144-401         0.77         401         34         144           FD074094-268         0.52         268         20         94           FD074114-281         0.66         13.4         281         21         114           FD074144-469         0.76         469         35         144           FD074094-330         0.53         330         22         94           FD074114-315         0.60         15.0         315         21         114           FD074144-510         1.06         510         34         144           FD074094-347         0.55         347         21         94           FD074114-380         0.72         16.5         380         23         114           FD074144-462         0.99         462         28         144           FD074144-396         0.67         18.0         396         22         114           FD074144-68         1.16         468         26         144           FD074144-520         1.06         520<	FD074114-221	0.65	9.6	221	23	114
FD074114-271         0.60         11.8         271         23         114           FD074144-401         0.77         401         34         144           FD074094-268         0.52         268         20         94           FD074114-281         0.66         13.4         281         21         114           FD074094-330         0.53         330         22         94           FD074114-315         0.60         15.0         315         21         114           FD074144-510         1.06         510         34         144           FD074094-347         0.55         347         21         94           FD074144-380         0.72         16.5         380         23         114           FD074144-462         0.99         462         28         144           FD074144-462         0.99         462         28         144           FD074144-468         1.16         468         26         144           FD074144-468         1.16         468         26         144           FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16<	FD074144-346	0.80		346	36	144
FD074144-401         0.77         401         34         144           FD074094-268         0.52         268         20         94           FD074114-281         0.66         13.4         281         21         114           FD074144-469         0.76         469         35         144           FD074094-330         0.53         330         22         94           FD074114-315         0.60         15.0         315         21         114           FD074144-510         1.06         510         34         144           FD074094-347         0.55         347         21         94           FD074144-380         0.72         16.5         380         23         114           FD074144-462         0.99         462         28         144           FD074094-306         0.57         306         17         94           FD074144-468         1.16         468         26         144           FD074144-520         1.06         520         26         144           FD074144-520         1.06         520         26         144           FD074144-630         1.06         360         16         94 <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>						
FD074094-268         0.52         268         20         94           FD074114-281         0.66         13.4         281         21         114           FD074144-469         0.76         469         35         144           FD074094-330         0.53         330         22         94           FD074114-315         0.60         15.0         315         21         114           FD074144-510         1.06         510         34         144           FD074094-347         0.55         347         21         94           FD074114-380         0.72         16.5         380         23         114           FD074144-462         0.99         462         28         144           FD074094-306         0.57         306         17         94           FD074114-396         0.67         18.0         396         22         114           FD074144-468         1.16         468         26         144           FD074144-520         1.06         520         26         144           FD074144-520         1.06         520         26         144           FD074144-630         1.06         630         28 </th <th></th> <th>0.60</th> <th>11.8</th> <th>271</th> <th></th> <th></th>		0.60	11.8	271		
FD074114-281         0.66         13.4         281         21         114           FD074144-469         0.76         469         35         144           FD074094-330         0.53         330         22         94           FD074114-315         0.60         15.0         315         21         114           FD074094-347         0.55         347         21         94           FD074114-380         0.72         16.5         380         23         114           FD074144-462         0.99         462         28         144           FD074114-396         0.67         18.0         396         22         114           FD074114-396         0.67         18.0         396         22         114           FD074144-468         1.16         468         26         144           FD074094-380         0.53         380         19         94           FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16         94           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400	FD074144-401	0.77		401	34	144
FD074144-469         0.76         469         35         144           FD074094-330         0.53         330         22         94           FD074114-315         0.60         15.0         315         21         114           FD074144-510         1.06         510         34         144           FD074094-347         0.55         347         21         94           FD074114-380         0.72         16.5         380         23         114           FD074144-462         0.99         462         28         144           FD074094-306         0.57         306         17         94           FD074114-396         0.67         18.0         396         22         114           FD074144-468         1.16         468         26         144           FD074094-380         0.53         380         19         94           FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16         94           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94						
FD074094-330         0.53           FD074114-315         0.60           15.0         315           21         114           FD074144-510         1.06           510         34           144         144           FD074094-347         0.55           347         21           94         94           FD07414-380         0.72           16.5         380         23           114         114           FD07414-462         0.99         462         28           144         114         114           FD07414-306         0.57         306         17           94         462         28         144           FD07414-396         0.67         18.0         396         22         114           FD07414-468         1.16         468         26         144           FD074094-380         0.53         380         19         94           FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16         94           FD074144-630         1.06         630         28<			13.4			
FD074114-315         0.60         15.0         315         21         114           FD074144-510         1.06         510         34         144           FD074094-347         0.55         347         21         94           FD074114-380         0.72         16.5         380         23         114           FD074144-462         0.99         462         28         144           FD074094-306         0.57         306         17         94           FD074114-396         0.67         18.0         396         22         114           FD074144-468         1.16         468         26         144           FD074094-380         0.53         380         19         94           FD074114-420         0.75         20.0         420         21         114           FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16         94           FD074114-495         0.84         22.5         495         22         114           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0						
FD074144-510         1.06         510         34         144           FD074094-347         0.55         347         21         94           FD074114-380         0.72         16.5         380         23         114           FD074144-462         0.99         462         28         144           FD074094-306         0.57         306         17         94           FD074114-396         0.67         18.0         396         22         114           FD074144-468         1.16         468         26         144           FD074094-380         0.53         380         19         94           FD074114-420         0.75         20.0         420         21         114           FD074094-360         0.60         360         16         94           FD074114-495         0.84         22.5         495         22         114           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0         525         21         114			45.0			
FD074094-347         0.55         347         21         94           FD074114-380         0.72         16.5         380         23         114           FD074144-462         0.99         462         28         144           FD074094-306         0.57         306         17         94           FD074114-396         0.67         18.0         396         22         114           FD074144-468         1.16         468         26         144           FD074094-380         0.53         380         19         94           FD074114-420         0.75         20.0         420         21         114           FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16         94           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0         525         21         114			15.0			
FD074114-380         0.72         16.5         380         23         114           FD074144-462         0.99         462         28         144           FD074094-306         0.57         306         17         94           FD074114-396         0.67         18.0         396         22         114           FD074144-468         1.16         468         26         144           FD074094-380         0.53         380         19         94           FD074114-420         0.75         20.0         420         21         114           FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16         94           FD074114-495         0.84         22.5         495         22         114           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0         525         21         114						
FD074144-462         0.99         462         28         144           FD074094-306         0.57         306         17         94           FD074114-396         0.67         18.0         396         22         114           FD074144-468         1.16         468         26         144           FD074094-380         0.53         380         19         94           FD074114-420         0.75         20.0         420         21         114           FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16         94           FD074114-495         0.84         22.5         495         22         114           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0         525         21         114			14 5			
FD074094-306         0.57         306         17         94           FD074114-396         0.67         18.0         396         22         114           FD074144-468         1.16         468         26         144           FD074094-380         0.53         380         19         94           FD074114-420         0.75         20.0         420         21         114           FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16         94           FD074114-495         0.84         22.5         495         22         114           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0         525         21         114			10.3			
FD074114-396         0.67         18.0         396         22         114           FD074144-468         1.16         468         26         144           FD074094-380         0.53         380         19         94           FD074114-420         0.75         20.0         420         21         114           FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16         94           FD074114-495         0.84         22.5         495         22         114           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0         525         21         114						
FD074144-468         1.16         468         26         144           FD074094-380         0.53         380         19         94           FD074114-420         0.75         20.0         420         21         114           FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16         94           FD074114-495         0.84         22.5         495         22         114           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0         525         21         114			1 R N			
FD074094-380         0.53         380         19         94           FD074114-420         0.75         20.0         420         21         114           FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16         94           FD074114-495         0.84         22.5         495         22         114           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0         525         21         114			10.0			
FD074114-420         0.75         20.0         420         21         114           FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16         94           FD074114-495         0.84         22.5         495         22         114           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0         525         21         114						
FD074144-520         1.06         520         26         144           FD074094-360         0.60         360         16         94           FD074114-495         0.84         22.5         495         22         114           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0         525         21         114			20.0			
FD074094-360         0.60         360         16         94           FD074114-495         0.84         22.5         495         22         114           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0         525         21         114						
FD074114-495         0.84         22.5         495         22         114           FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0         525         21         114						
FD074144-630         1.06         630         28         144           FD074094-400         0.64         400         16         94           FD074114-525         0.86         25.0         525         21         114			22.5			
FD074114-525 0.86 25.0 525 21 114						
	FD074094-400	0.64		400	16	94
FD074144-675 1.11 675 27 144	FD074114-525	0.86	25.0	525	21	114
	FD074144-675	1.11		675	27	144

# Spring mounts, open

# **Product description**

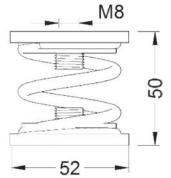
Open steel spring with aluminium mounting plates. For vibration isolation of machines with speeds of more than 500 rpm.

An aluminium mounting plate is fitted to the top and bottom of the spring.

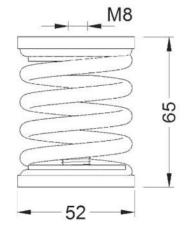
## **Application**

For use in harsher environments. Used, for instance, in Genvex units, heat pumps, fans, air conditioners and cooling towers.

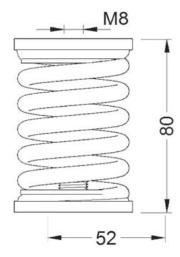












Туре	Mount weight [g]	Stiffness [kg/mm]	Load [kg]	Deflection [mm]	Height [mm]
FD05250-009	0.17		9	18	50
FD05265-016	0.16	0.5	16	31	65
FD05280-019	0.18		19	38	80
FD05250-018	0.17		18	18	50
FD05265-028	0.17	1.0	28	28	65
FD05280-036	0.19		36	36	80
FD05250-027	0.18		27	17	50
FD05265-042	0.19	1.6	42	26	65
FD05280-050	0.22		50	31	80
FD05250-038	0.17		38	18	50
FD05265-057	0.19	2.1	57	27	65
FD05280-067	0.26		67	32	80
FD05250-045	0.19		45	16	50
FD05265-070	0.22	2.8	70	25	65
FD05280-070	0.28		70	25	80
FD05250-059	0.18		59	15	50
FD05265-094	0.22	3.9	94	24	65
FD05280-113	0.28		113	29	80
FD05250-070	0.21		70	14	50
FD05265-105	0.24	5.0	105	21	65
FD05280-130	0.28		130	26	80
FD05250-088	0.21		88	14	50
FD05265-126	0.24	6.3	126	20	65
FD05280-158	0.30		158	25	80
FD05250-098	0.21		98	13	50
FD05265-150	0.25	7.5	150	20	65
FD05280-165	0.37		165	22	80
FD05250-115	0.22		115	12	50
FD05265-173	0.27	9.6	173	18	65
FD05280-182	0.38		182	19	80
FD05250-142	0.25		142	12	50
FD05265-212	0.28	11.8	212	18	65
FD05280-224	0.37		224	19	80
FD05250-154	0.24		154	11	50
FD05265-252	0.29	14.0	252	18	65
FD05280-238	0.41		238	17	80
FD05265-272	0.31	16.0	272	17	65
FD05250-187	0.25	17.0	187	11	50
FD05265-288	0.30	18.0	288	16	65
FD05265-300	0.35	20.0	300	15	65
FD05265-308	0.35	22.0	308	14	65
FD05265-336	0.30	24.0	336	14	65

# **Spring mounts**

## **Product description**

Designed for vibration isolation of machines at a speed of more than 500 rpm. Can handle loads from 30-155 kg.

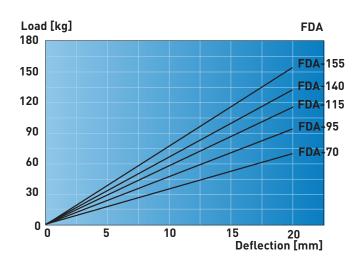
Vertical natural frequency of 3.5 to 5 Hz.

## **Components**

- Steel spring
- Rubber mount
- Mounting plates
- Galvanised metal parts

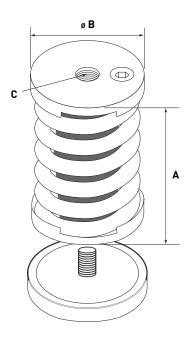
## **Application**

Especially suitable for generators, compressors, fans, pumps, refrigeration equipment, etc.



Туре	A [mm]	B Ø [mm]	С
FDA 70	80	54	M8
FDA 70 with base plate	87	54	M8
FDA 95	80	54	M8
FDA 95 with base plate	87	54	M8
FDA 115	80	54	M8
FDA 115 with base plate	87	54	M8
FDA 140	80	54	M8
FDA 140 with base plate	87	54	M8
FDA 155	80	54	M8
FDA 155 with base plate	87	54	M8





# Stainless-steel spring mounts

# **Product description**

Designed for vibration isolation of machines with speeds of more than  $450\ \text{rpm}.$ 

Can handle loads of 12-125 kg.

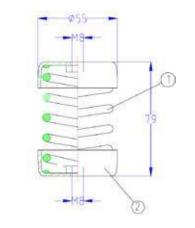
## **Components**

- 1 Stainless-steel spring FDA 25-75 in AISI 316L, 850t salt fog FDA 100-125 in AISI 302, 650t salt fog
- 2 Top and bottom casing AISI 316L
- 3 Bottom screw AISI 316L
- 4 Base plate AISI 316L
- 5 EVA rubber, adhered

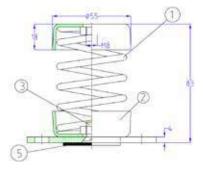
# **Application**

Particularly suited for outdoor electrical installations or installation in aggressive environments, generators, compressors, fans, pumps, refrigeration equipment, etc.

Туре	Maximum load [kg]	Deflection [mm]
FDA025-316	25	24
FDA025-316B1	25	24
FDA025-316B2	25	24
FDA050-316	50	24
FDA050-316B1	50	24
FDA050-316B2	50	24
FDA075-316	75	24
FDA075-316B1	75	24
FDA075-316B2	75	24
FDA100-316	100	24
FDA100-316B1	100	24
FDA100-316B2	100	24
FDA125-316	125	24
FDA125-316B1	125	24
FDA125-316B2	125	24

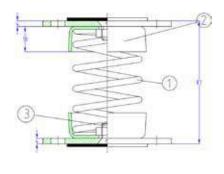






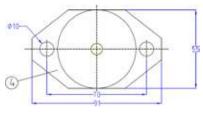


TYPE FDA-316B1





TYPE FDA-316B2



💠 Base plate

# **Spring mounts**

#### **Product description**

Designed for vibration isolation of machines with speeds of more than 350 rpm.

Can handle loads from 150 to 750 kg.

## **Components**

- Steel spring
- Rubber mount
- Mounting plates
- Galvanised metal parts

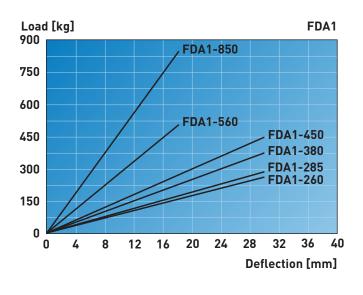
## **Properties**

FDA 1-150, 1-200 FDA, FDA 1-250, FDA 1-350, Vertical natural frequency from 1.6 to 4 Hz.

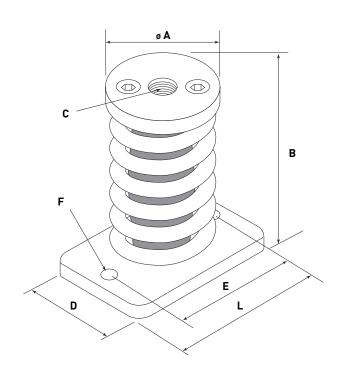
FDA 1-500, FDA 1-750, Vertical natural frequency of 3 to 4 Hz.



Especially suitable for generators, compressors, fans, pumps, refrigeration equipment, etc.







ТҮРЕ	A Ø [mm]	B [mm]	С	D [mm]	E [mm]	F Ø [mm]	L [mm]
FDA1-260	75	120	M12	75	87	10	115
FDA1-285	75	120	M12	75	87	10	115
FDA1-380	75	120	M12	75	87	10	115
FDA1-450	75	120	M12	75	87	10	115
FDA1-560	90	130	M14	100	120	12	150
FDA1-850	90	130	M14	100	120	12	150

# Stainless-steel spring mounts

# **Product description**

Designed for vibration isolation of machines at a speed of more than 350 rpm. Can handle loads of 75–350 kg.

## **Components**

- 1 Stainless-steel spring AISI 302, 650t salt fog
- 2 Top and bottom casing AISI 316L
- 3 Base plate AISI 316L
- 4 Bottom screw AISI 316L
- 5 EVA rubber, adhered
- 6 Top casing

# 20 20 0 73

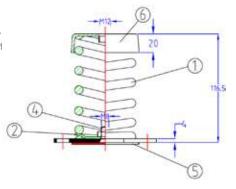


TYPE FDA1-316

## **Application**

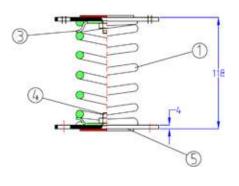
Particularly suited for outdoor electrical installations or installation in aggressive environments, generators compressors, fans, pumps, refrigeration equipment, el

Туре	Maximum load [kg]	Deflection [mm]
FDA1-150-316	150	30
FDA1-150-316B1	150	30
FDA1-150-316B2	150	30
FDA1-200-316	200	30
FDA1-200-316B1	200	30
FDA1-200-316B2	200	30
FDA1-250-316	250	30
FDA1-250-316B1	250	30
FDA1-250-316B2	250	30
FDA1-300-316	300	30
FDA1-300-316B1	300	30
FDA1-300-316B2	300	30
FDA1-350-316	350	30
FDA1-350-316B1	350	30
FDA1-350-316B2	350	30



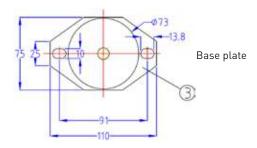


TYPE FDA1-316B1





TYPE FDA1-316B2



# Spring anti-vibration mounts

#### **Product description**

Designed for vibration isolation of machines with speeds of more than 350 rpm. Can handle loads from 225–2250 kg.

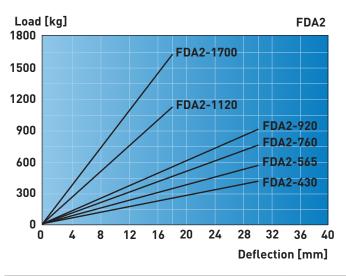
## Flexible properties

FDA2-520 to FDA-900 and FDA 3-450 to FDA 3-1050. Vertical natural frequency of 1.6 to 4 Hz.

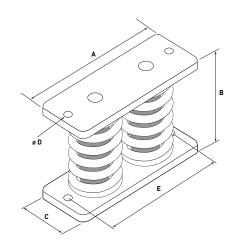
FDA2-1120 to FDA2-1700 and FDA 3-1500 to FDA 3-2250. Vertical natural frequency of 3 to 5 Hz.

#### **Application**

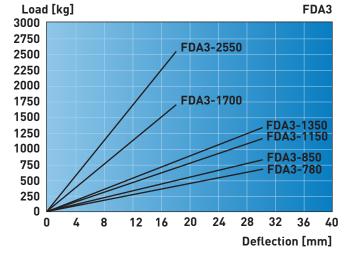
Especially suitable for generators, compressors, fans, pumps, refrigeration equipment, etc.

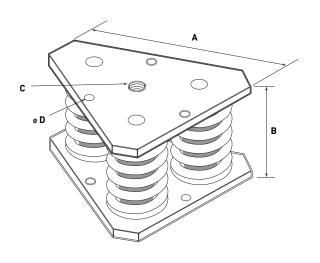






Туре	A [mm]	W [mm]	C [mm]	DØ[mm]	E [mm]
FDA2-520/FDA2-900	200	124	75	12	170
FDA2-1120/FDA2-1700	250	134	100	14	210





TYPE A [mm]		W [mm]	С	D Ø [mm]
FDA3-450/FDA3-1050	<b>A3-1050</b> 190		M16	12
FDA3-1500/FDA3-2250	242	134	M20	14

# Spring anti-vibration mounts

# **Product description**

Designed for vibration isolation of machines with speeds of more than 350 rpm. Can handle loads from 300 to 3750 kg.

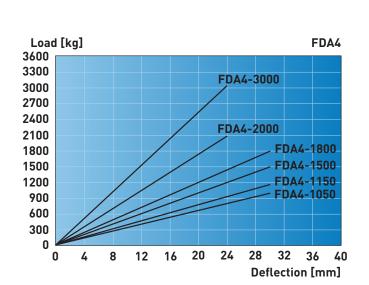
## **Properties**

FDA 4-600 to FDA 4-1400 and FDA 5-750 to FDA 5-1750. Vertical natural frequency of 1.6 to 4 Hz.

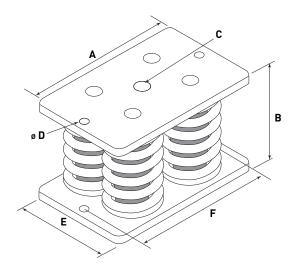
FDA 4-2000, FDA 4-3000 and FDA 5-2500, 5-3750. Vertical natural frequency of 3 to 5 Hz.

# **Application**

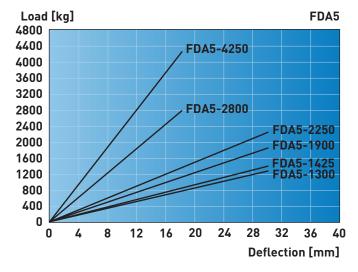
Especially suitable for generators, compressors, fans, pumps, refrigeration equipment, etc.

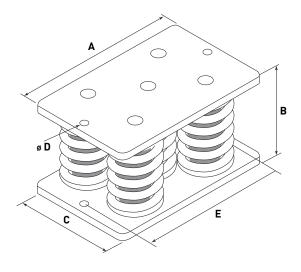






Туре	Type A [mm] W [mm		С	D Ø (mm)	E [mm]	F [mm]
FDA4-600 - 1400	200 124		124 M16			170
FDA4-2000 - 3000	250	134	M20	14	200	210





Туре	A [mm]	A [mm] W [mm]		DØ[mm]	E [mm]
FDA5-750 – 1750	280 124		150	16	248
FDA5-2500 - 3750	350	134	200	18	300

# Spring anti-vibration mounts

#### **Product description**

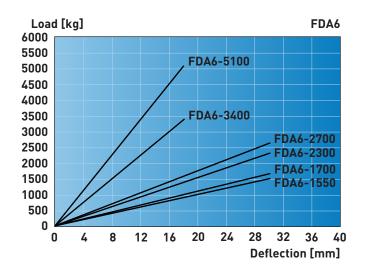
Designed for vibration isolation of machines with speeds of more than 350 rpm. Can handle loads from 300–3750 kg.

## **Application**

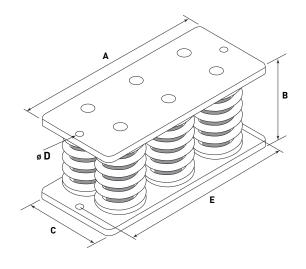
Especially suitable for generators, compressors, fans, pumps, refrigeration equipment, etc.

## **Properties**

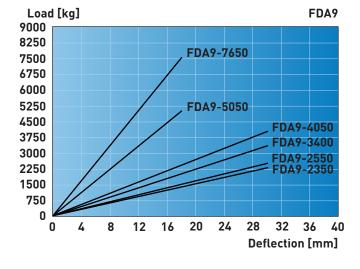
- FDA 4-600 to FDA 4-1400 and FDA 5-750 to FDA 5-1750.
  - Vertical natural frequency of 1.6 to 4 Hz.
- FDA 4-2000, FDA 4-3000 and FDA 5-2500, 5-3750.
   Vertical natural frequency of 3 to 5 Hz.

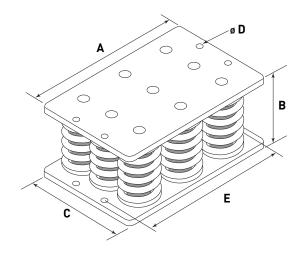






Туре	A [mm]	W [mm]	C [mm]	D Ø [mm]	E [mm]
FDA6-900 – 2100	280	280 124		16	248
FDA6-3000 & 4500	350	134	200	18	300





Туре	A [mm]	W [mm]	C [mm]	DØ[mm]	E [mm]
FDA9-1350 - 3150	280	280 124		16	248
FDA9-4500 & 6750	350	134	300	18	300

# Levelling spring mounts with height stop

# **Product description**

FDR mounts are designed for applications where the transmission of low-frequency mechanical vibrations to a building structure needs reducing to prevent building damage or nuisance to residents.

The FDR mount is also designed to limit vertical movement when the mount unloads and has an upward motion. Its movement is limited by the stop's settings so that damage to the pipe connections is avoided.

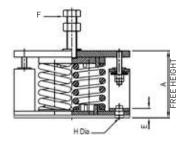
The installation rests directly on the top plate and the height is adjusted by turning F, which presses down a plate which compresses the springs.

## **Application**

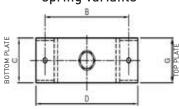
Used for chillers, cooling towers, ventilation systems, compressor systems, pumps, blowers, and similar devices which have pipe connections which may be affected by large vertical shear of the system. The vertical movement can also occur during maintenance and renovation of pumps or motors on inertia foundations.



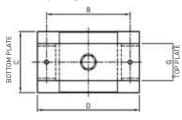
#### FDR2 & FDR4



# FDR2 with 2 spring variants



# FDR4 with 2 spring variants

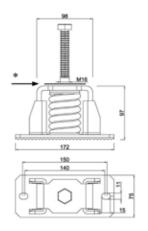


	Deflec-	Max. load					Dime	nsion	s [mm]			Max.
Туре	tion [mm]	[kg]	Colour	A	В	С	D	Ε	F	G	н	weight [kg]
FDR2-0200-25		200	Yellow									
FDR2-0400-25		400	Red									
FDR2-0600-25		600	Purple									
FDR2-0800-25	25	800	Grey	160	230	100	280	22	M24 x 100	100	M16	12.4
FDR2-1000-25		1000	Orange	100	230	100	200	22	M24 X 100	100	IVITO	12.4
FDR2-1200-25		1200	Brown									
FDR2-1600-25	1600 Black											
FDR2-2000-25		2000	Blue									
FDR2-0200-50		200	Yellow		187 230					100	M16	13.3
FDR2-0400-50	50	400	Green			30 100	00 280	22	M24 x 100			
FDR2-0600-50		600	Blue	187								
FDR2-0800-50		800	White									
FDR2-1000-50		1000	Red									
FDR4-0400-25		400	Yellow							100		
FDR4-0800-25		800	Red					80 22	M24 x 100			
FDR4-1200-25		1200	Purple									
FDR4-1600-25	25	1600	Grey	160	230	165	280				M16	16.4
FDR4-2000-25		2000	Orange	100	230	103	200	22	M24 X 100	100	IVITO	10.4
FDR4-2400-25		2400	Brown									
FDR4-3200-25		3200	Black									
FDR4-4000-25		4000	Blue									
FDR4-0400-50		400	Yellow									16.3
FDR4-0800-50		800	Green									
FDR4-1200-50	50	1200	Blue	187	230	165	280	22	M24 x 100	100	M16	
FDR4-1600-50		1600	White									
FDR4-2000-50		2000	Red									

# Housed spring mounts with leveling device

## **Product description**

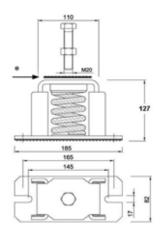
Housed spring mount with motion limitation in the horizontal plane. For the vibration isolation of machines with speeds of more than 350 rpm. A Nylon mounting plate is mounted to the top and bottom of the spring.





#### Use

Mainly for indoor use, where there may be horizontal loads, and for equipment where the centre of gravity is high and the setup is unstable. Fans, air conditioners and cooling towers. Turn the top centre screw to level the equipment.





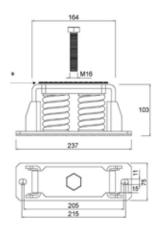
97 mm	Load [kg]	Deflection [mm]	Stiffness [kg/mm]	Mount weight [kg]
Туре				
FDH1097-020	20	39	0.5	1.89
FDH1097-038	38	38	1.0	1.90
FDH1097-059	59	37	1.6	1.91
FDH1097-067	67	32	2.1	2.00
FDH1097-092	92	33	2.8	1.94
FDH1097-109	109	28	3.9	1.98
FDH1097-140	140	28	5.0	2.00
FDH1097-158	158	25	6.3	2.04
FDH1097-188	188	25	7.5	2.07
FDH1097-221	221	23	9.6	2.08
FDH1097-248	248	21	11.8	2.12
FDH1097-268	268	20	13.4	2.13
FDH1097-345	345	23	15.0	2.15
FDH1097-347	347	21	16.5	2.16
FDH1097-324	324	18	18.0	2.18
FDH1097-400	400	20	20.0	2.14
FDH1097-383	383	17	22.5	2.21
FDH1097-425	425	17	25.0	2.25
FDH1097-459	459	17	27.0	2.28
FDH1097-493	493	17	29.0	2.36

Туре	Load [kg]	[mm]	[kg/mm]	weight [kg]
FDH1127-024	24	48	0.5	3.52
FDH1127-045	45	45	1.0	3.54
FDH1127-070	70	44	1.6	3.57
FDH1127-084	84	40	2.1	3.60
FDH1127-104	104	37	2.8	3.64
FDH1127-137	137	35	3.9	3.68
FDH1127-160	160	32	5.0	3.70
FDH1127-183	183	29	6.3	3.75
FDH1127-240	240	32	7.5	3.75
FDH1127-230	230	24	9.6	3.86
FDH1127-271	271	23	11.8	3.80
FDH1127-295	295	22	13.4	3.86
FDH1127-330	330	22	15.0	3.81
FDH1127-396	396	24	16.5	3.93
FDH1127-414	414	23	18.0	3.87
FDH1127-440	440	22	20.0	3.96
FDH1127-495	495	22	22.5	4.05
FDH1127-525	525	21	25.0	4.06
FDH1127-621	621	23	27.0	4.07
FDH1127-609	609	21	29.0	4.00
FDH1127-662	662	21	31.5	4.16
FDH1127-680	680	20	34.0	4.24
FDH1127-740	740	20	37.0	4.25
FDH1127-760	760	19	40.0	4.05
FDH1127-774	774	18	43.0	4.15

# Housed spring mounts with leveling device

# **Product description**

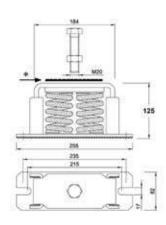
Housed spring mount with motion limitation in the horizontal plane. For the vibration isolation of machines with speeds of more than 350 rpm. A Nylon mounting plate is mounted to the top and bottom of the spring.





#### Use

For outdoor use, where there may be wind loads, and for equipment where the centre of gravity is high and the setup is unstable. Fans, air conditioners and cooling towers. Turn the top centre screw to level the equipment.





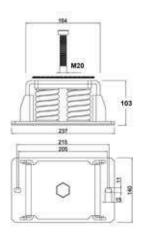
103 mm	Load [kg]	Deflection	Stiffness	Mount
Туре		[mm]	[kg/mm]	weight [kg]
FDH2103-0039	39	39	1.0	2.61
FDH2103-0076	76	38	2.0	2.63
FDH2103-0118	118	37	3.2	2.65
FDH2103-0134	134	32	4.2	2.81
FDH2103-0185	185	33	5.6	2.71
FDH2103-0218	218	28	7.8	2.77
FDH2103-0280	280	28	10.0	2.83
FDH2103-0315	315	25	12.6	2.90
FDH2103-0375	375	25	15.0	2.95
FDH2103-0442	442	23	19.2	2.99
FDH2103-0496	496	21	23.6	3.05
FDH2103-0536	536	20	26.8	3.08
FDH2103-0690	690	23	30.0	3.12
FDH2103-0693	693	21	33.0	3.15
FDH2103-0648	648	18	36.0	3.18
FDH2103-0800	800	20	40.0	3.10
FDH2103-0765	765	17	45.0	3.25
FDH2103-0850	850	17	50.0	3.33
FDH2103-0918	918	17	54.0	3.38
FDH2103-0986	986	17	58.0	3.54

Туре	Load [kg]	[mm]	[kg/mm]	weight [kg]
FDH2125-0048	48	48	1.0	4.93
FDH2125-0090	90	45	2.0	4.98
FDH2125-0141	141	44	3.2	5.02
FDH2125-0168	168	40	4.2	5.08
FDH2125-0207	207	37	5.6	5.17
FDH2125-0273	273	35	7.8	5.25
FDH2125-0320	320	32	10.0	5.30
FDH2125-0365	365	29	12.6	5.40
FDH2125-0480	480	32	15.0	5.39
FDH2125-0461	461	24	19.2	5.61
FDH2125-0543	543	23	23.6	5.49
FDH2125-0590	590	22	26.8	5.61
FDH2125-0660	660	22	30.0	5.51
FDH2125-0792	792	24	33.0	5.74
FDH2125-0828	828	23	36.0	5.63
FDH2125-0880	880	22	40.0	5.80
FDH2125-0990	990	22	45.0	5.99
FDH2125-1050	1050	21	50.0	6.02
FDH2125-1242	1242	23	54.0	6.03
FDH2125-1218	1218	21	58.0	5.88
FDH2125-1323	1323	21	63.0	6.21
FDH2125-1360	1360	20	68.0	6.38
FDH2125-1480	1480	20	74.0	6.39
FDH2125-1520	1520	19	80.0	5.99
FDH2125-1548	1548	18	86.0	6.18

# Housed spring mounts with leveling device

## **Product description**

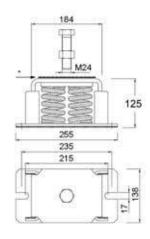
Housed spring mount with motion limitation in the horizontal plane. For the vibration isolation of machines with speeds of more than 350 rpm. A Nylon mounting plate is mounted to the top and bottom of the spring.





#### Use

Mainly for indoor use, where there may be horizontal loads, and for equipment where the centre of gravity is high and the setup is unstable. Fans, air conditioners and cooling towers. Turn the top centre screw to level the equipment.





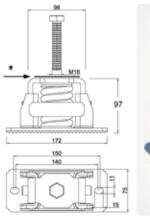
103 mm	Load [kg]	Deflection [mm]	Stiffness [kg/mm]	Mount weight [kg]
Туре				
FDH4103-0078	78	39	2.0	5.32
FDH4103-0148	148	38	4.0	5.37
FDH4103-0236	236	37	6.4	3.40
FDH4103-0268	268	32	8.4	5.74
FDH4103-0369	369	33	11.2	5.52
FDH4103-0421	421	28	15.6	5.66
FDH4103-0540	540	28	20.0	5.77
FDH4103-0630	630	25	25.2	5.91
FDH4103-0750	750	25	30.0	6.02
FDH4103-0883	883	23	38.4	6.08
FDH4103-0991	991	21	47.2	6.22
FDH4103-1072	1072	20	53.6	6.27
FDH4103-1320	1320	23	60.0	6.36
FDH4103-1386	1386	21	66.0	6.41
FDH4103-1224	1224	18	72.0	6.48
FDH4103-1520	1520	20	80.0	6.32
FDH4103-1440	1440	17	90.0	6.60
FDH4103-1600	1600	17	100.0	6.77
FDH4103-1836	1836	17	108.0	6.88
FDH4103-1856	1856	17	116.0	7.19

Туре	Load [kg]	Deflection [mm]	Stiffness [kg/mm]	Mount weight [kg]
FDH4125-0096	96	48	2.0	8.90
FDH4125-0180	180	45	4.0	8.99
FDH4125-0282	282	44	6.4	9.08
FDH4125-0336	336	40	8.4	9.20
FDH4125-0414	414	37	11.2	9.37
FDH4125-0546	546	35	15.6	9.54
FDH4125-0640	640	32	20.0	9.63
FDH4125-0731	731	29	25.2	9.83
FDH4125-0960	960	32	30.0	9.82
FDH4125-0922	922	24	38.4	9.82
FDH4125-1086	1086	23	47.2	10.26
FDH4125-1179	1179	22	53.6	10.02
FDH4125-1320	1320	22	60.0	10.26
FDH4125-1584	1584	24	66.0	10.06
FDH4125-1656	1656	23	72.0	10.52
FDH4125-1760	1760	22	80.0	10.30
FDH4125-1980	1980	22	90.0	10.64
FDH4125-2100	2100	21	100.0	11.01
FDH4125-2484	2484	23	108.0	11.072
FDH4125-2436	2436	21	116.0	10.80
FDH4125-2646	2646	21	126.0	11.46
FDH4125-2720	2720	20	136.0	11.79
FDH4125-2960	2960	20	148.0	11.82
FDH4125-3040	3040	19	160.0	11.01
FDH4125-3096	3096	18	172.0	11.40

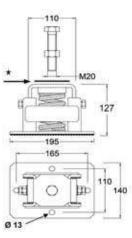
# Seismic spring mounts with leveling device

### **Product description**

Seismic spring mount with motion limitation in the horizontal plane. For the vibration isolation of machines with speeds of more than 350 rpm. A Nylon mounting plate is mounted to the top and bottom of the spring.



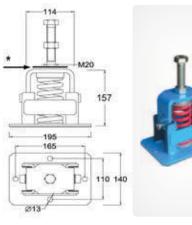




# Use

For Seismic zones and where there may be wind loads. also for equipment where the centre of gravity is high and the setup is unstable. Fans, air conditioners and cooling towers. Turn the top centre screw to level the equipment.







97 mm	oad [kg]	[mm] uc	[kg/mm]	eight [kg]
Туре	Load	Deflection [mm	Stiffness [kg/mm]	Mount weight [kg
FDS1097-020	20	39	0.5	2.01
FDS1097-038	38	38	1.0	2.03
FDS1097-059	59	37	1.6	2.03
FDS1097-067	67	32	2.1	2.12
FDS1097-092	92	33	2.8	2.06
FDS1097-109	109	28	3.9	2.10
FDS1097-140	140	28	5.0	2.13
FDS1097-158	158	25	6.3	2.16
FDS1097-188	188	25	7.5	2.19
FDS1097-221	221	23	9.6	2.20
FDS1097-248	248	21	11.8	2.24
FDS1097-268	268	20	13.4	2.25
FDS1097-345	345	23	15.0	2.27
FDS1097-347	347	21	16.5	2.29
FDS1097-324	324	18	18.0	2.30
FDS1097-400	400	20	20.0	2.26
FDS1097-383	383	17	22.5	2.33
FDS1097-425	425	17	25.0	2.38
FDS1097-459	459	17	27.0	2.40
FDS1097-493	493	17	29.0	2.48

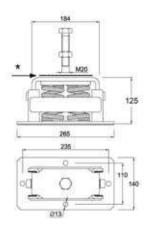
127 mm	[kg]	n [mm]	kg/mn	ight [kç
Туре	Load	Deflection [mm	Stiffness [kg/m	Mount wei
FDS1127-024	24	48	0.5	3.93
FDS1127-045	45	45	1.0	3.96
FDS1127-070	70	44	1.6	3.98
FDS1127-084	84	40	2.1	4.01
FDS1127-104	104	37	2.8	4.05
FDS1127-137	137	35	3.9	4.09
FDS1127-160	160	32	5.0	4.12
FDS1127-183	183	29	6.3	4.17
FDS1127-240	240	32	7.5	4.16
FDS1127-230	230	24	9.6	4.27
FDS1127-271	271	23	11.8	4.22
FDS1127-295	295	22	13.4	4.28
FDS1127-330	330	22	15.0	4.22
FDS1127-396	396	24	16.5	4.34
FDS1127-414	414	23	18.0	4.29
FDS1127-440	440	22	20.0	4.37
FDS1127-495	495	22	22.5	4.46
FDS1127-525	525	21	25.0	4.48
FDS1127-621	621	23	27.0	4.48
FDS1127-609	609	21	29.0	4.41
FDS1127-662	662	21	31.5	4.58
FDS1127-680	680	20	34.0	4.66
FDS1127-740	740	20	37.0	4.66
FDS1127-760	760	19	40.0	4.46
FDS1127-774	774	18	43.0	4.56

157 mm	[kg]	[ww] u	[kg/mm]	ight [kg
Туре	Load [kg	Deflection [mm	Stiffness	Mountwe
FDS1157-028	28	55	0.5	4.02
FDS1157-051	51	51	1.0	4.08
FDS1157-078	78	49	1.6	4.17
FDS1157-099	99	47	2.1	4.17
FDS1157-132	132	47	2.8	4.23
FDS1157-168	168	43	3.9	4.19
FDS1157-210	210	42	5.0	4.23
FDS1157-265	265	42	6.3	4.28
FDS1157-278	278	37	7.5	4.35
FDS1157-346	346	36	9.6	4.42
FDS1157-401	401	34	11.8	4.39
FDS1157-482	482	36	13.4	4.38
FDS1157-510	510	34	15.0	4.68
FDS1157-462	462	28	16.5	4.61
FDS1157-468	468	26	18.0	4.78
FDS1157-540	540	27	20.0	4.68
FDS1157-630	630	28	22.5	4.68
FDS1157-700	700	28	25.0	4.73
FDS1157-837	837	31	27.0	4.83
FDS1157-725	725	25	29.0	4.90
FDS1157-914	914	29	31.5	4.79
FDS1157-782	782	23	34.0	4.89
FDS1157-814	814	22	37.0	5.00

# Seismic spring mounts with leveling device

### **Product description**

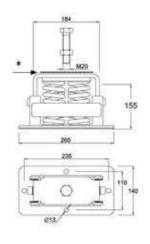
Seismic spring mount with motion limitation in the horizontal plane. For the vibration isolation of machines with speeds of more than 350 rpm. A Nylon mounting plate is mounted to the top and bottom of the spring.





### Use

For Seismic zones and where there may be wind loads. also for equipment where the centre of gravity is high and the setup is unstable. Fans, air conditioners and cooling towers. Turn the top centre screw to level the equipment.





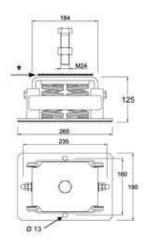
125 mm	Local Devil	Deflection	Stiffness	Mount
Туре	Load [kg]	[mm]	[kg/mm]	weight [kg]
FDS2125-0048	48	48	1.0	5.33
FDS2125-0090	90	45	2.0	5.37
FDS2125-0141	141	44	3.2	5.42
FDS2125-0168	168	40	4.2	5.48
FDS2125-0207	207	37	5.6	5.56
FDS2125-0273	273	35	7.8	5.65
FDS2125-0320	320	32	10.0	5.69
FDS2125-0365	365	29	12.6	5.79
FDS2125-0480	480	32	15.0	5.79
FDS2125-0461	461	24	19.2	6.01
FDS2125-0543	543	23	23.6	5.89
FDS2125-0590	590	22	26.8	6.01
FDS2125-0660	660	22	30.0	5.91
FDS2125-0792	792	24	33.0	6.14
FDS2125-0828	828	23	36.0	6.03
FDS2125-0880	880	22	40.0	6.20
FDS2125-0990	990	22	45.0	6.38
FDS2125-1050	1050	21	50.0	6.41
FDS2125-1242	1242	23	54.0	6.43
FDS2125-1218	1218	21	58.0	6.28
FDS2125-1323	1323	21	63.0	6.61
FDS2125-1360	1360	20	68.0	6.77
FDS2125-1480	1480	20	74.0	6.79
FDS2125-1520	1520	19	80.0	6.38
FDS2125-1548	1548	18	86.0	6.58

155 mm	Load [kg]	Deflection	Stiffness	Mount
Туре	Load [kg]	[mm]	[kg/mm]	weight [kg]
FDS2155-0055	55	55	1.0	5.49
FDS2155-0102	102	51	2.0	5.62
FDS2155-0157	157	49	3.2	5.79
FDS2155-0197	197	47	4.2	5.81
FDS2155-0263	263	47	5.6	5.91
FDS2155-0335	335	43	7.8	5.83
FDS2155-0420	420	42	10.0	5.92
FDS2155-0529	529	42	12.6	6.02
FDS2155-0555	555	37	15.0	6.17
FDS2155-0691	691	36	19.2	6.31
FDS2155-0802	802	34	23.6	6.23
FDS2155-0965	965	36	26.8	6.21
FDS2155-1020	1020	34	30.0	6.83
FDS2155-0924	924	28	33.0	6.67
FDS2155-0936	936	26	36.0	7.02
FDS2155-1080	1080	27	40.0	6.82
FDS2155-1260	1260	28	45.0	6.83
FDS2155-1400	1400	28	50.0	6.92
FDS2155-1674	1674	31	54.0	7.12
FDS2155-1450	1450	25	58.0	7.25
FDS2155-1827	1827	29	63.0	7.04
FDS2155-1564	1564	23	68.0	7.23
FDS2155-1628	1628	22	74.0	7.45

# Seismic spring mounts with leveling device

# **Product description**

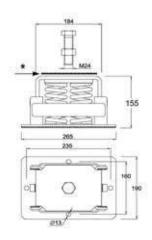
Seismic spring mount with motion limitation in the horizontal plane. For the vibration isolation of machines with speeds of more than 350 rpm. A Nylon mounting plate is mounted to the top and bottom of the spring.





### Use

For Seismic zones and where there may be wind loads. also for equipment where the centre of gravity is high and the setup is unstable. Fans, air conditioners and cooling towers. Turn the top centre screw to level the equipment.





125 mm	Load [kg]	Deflection	Stiffness	Mount
Туре	Load [kg]	[mm]	[kg/mm]	weight [kg]
FDS4125-0096	96	48	2.0	8.24
FDS4125-0180	180	45	4.0	8.34
FDS4125-0282	282	44	6.4	8.43
FDS4125-0336	336	40	8.4	8.55
FDS4125-0414	414	37	11.2	8.72
FDS4125-0546	546	35	15.6	8.88
FDS4125-0640	640	32	20.0	8.98
FDS4125-0731	731	29	25.2	9.18
FDS4125-0960	960	32	30.0	9.16
FDS4125-0922	922	24	38.4	9.60
FDS4125-1086	1086	23	47.2	9.37
FDS4125-1179	1179	22	53.6	9.60
FDS4125-1320	1320	22	60.0	9.37
FDS4125-1584	1584	24	66.0	9.61
FDS4125-1656	1656	23	72.0	9.40
FDS4125-1760	1760	22	80.0	9.87
FDS4125-1980	1980	22	90.0	9.65
FDS4125-2100	2100	21	100.0	9.99
FDS4125-2484	2484	23	108.0	10.36
FDS4125-2436	2436	21	116.0	10.42
FDS4125-2646	2646	21	126.0	10.44
FDS4125-2720	2720	20	136.0	10.15
FDS4125-2960	2960	20	148.0	11.67
FDS4125-3040	3040	19	160.0	12.06
FDS4125-3096	3096	18	172.0	12.50

155 mm	Load [kg]	Deflection	Stiffness	Mount
Туре		[mm]	[kg/mm]	weight [kg]
FDS4155-110	110	55	2.0	8.57
FDS4155-204	204	51	4.0	8.84
FDS4155-307	307	49	6.4	9.17
FDS4155-395	395	47	8.4	9.20
FDS4155-526	526	47	11.2	9.41
FDS4155-671	671	43	15.6	9.25
FDS4155-840	840	42	20.0	9.43
FDS4155-1058	1058	42	25.2	9.34
FDS4155-1110	1110	37	30.0	9.92
FDS4155-1382	1382	36	38.4	10.20
FDS4155-1605	1605	34	47.2	10.08
FDS4155-1930	1930	36	53.6	10.02
FDS4155-2040	2040	34	60.0	11.24
FDS4155-1848	1848	28	66.0	10.94
FDS4155-1872	1872	26	72.0	11.64
FDS4155-2160	2160	27	80.0	11.24
FDS4155-2520	2520	28	90.0	11.24
FDS4155-2800	2800	28	100.0	11.44
FDS4155-3348	3348	31	108.0	11.84
FDS4155-2900	2900	25	116.0	12.10
FDS4155-3654	3654	29	126.0	11.67
FDS4155-3128	3128	23	136.0	12.06
FDS4155-3256	3256	22	148.0	13.65

# VIKAS Ceiling Hanger and Wall Mount

# **Product description**

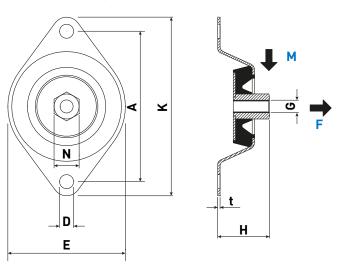
Anti-vibration mount with rubber vulcanised to the galvanised metal parts. Type VTOE is a secured type mount which, when overloaded or if the rubber breaks, will still keep the mounted equipment in place.

### **Application**

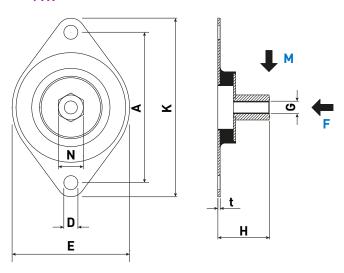
- VTOE is used as the upper mount when mounting electrical cabinets or other equipment on vertical surfaces
- VTN is used as the lower bracket and is not secured.
- VTOE can also be used for equipment which is mounted on ceilings.



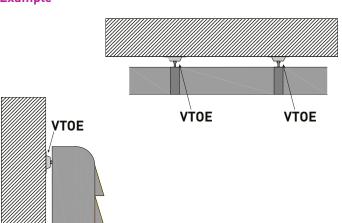








### Example



Model	40 Sh(A)		60 Sh(A)		
Modet	M max [kg]	F max [kg]	M max [kg]	F max [kg]	
VT0E	14	30	25	70	
VTN	14	30	25	70	

Dimensions [mm]	Α	D	Е	G	Н	0	N	t
VTOE	96	9	75	M8	33	114	15	1.5
VTN	96	9	75	M8	33	114	15	1.5

VTN

# VIKAS Ceiling Hanger 1 and 2

### **Product description**

Spring mounts for vibration isolation of suspended machinery or installations.

The mount provides excellent vibration isolation due to the high deflection of up to 30 mm.

### **Materials**

Electro-galvanised steel and natural rubber.

### **Dimensions**

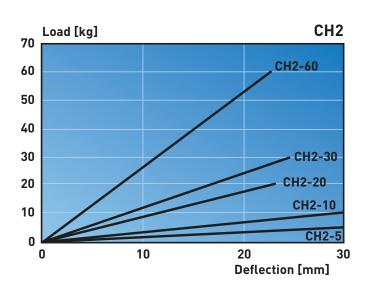
Steel thickness: 1.5 mm

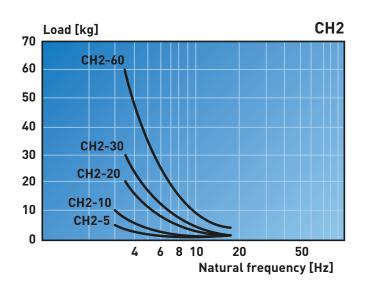
• Thread: M8

Total width: 40 mmTotal length: 118 mm

### **Application**

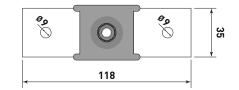
Smaller air conditioning units, gas/water pipes and fans.

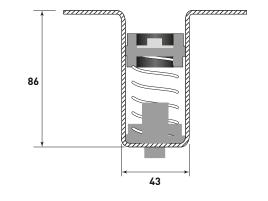




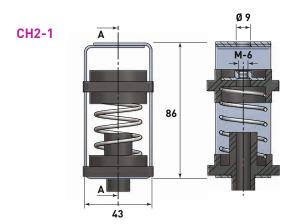












# Ceiling Hanger

### **Product description**

CH1 is designed for acoustic ceilings which are to be suspended elastically, or for the vibration isolation of pipes and machines at speeds or frequencies of more than 400 rpm. Loads from 25–350 kg.

### **Components**

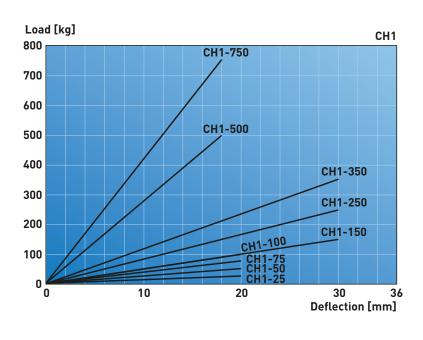
The ceiling bracket consists of a spring inserted into a bent steel bracket. The spring rests in a rubber cup which eliminates the transfer of high frequencies. All metal surfaces are galvanised

### Flexible properties

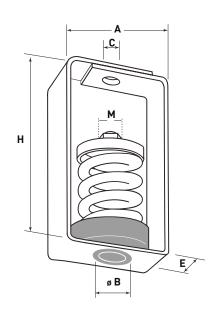
- For: CH1-150, CH1-250 and CH1-350, the natural frequency is from 1.6 to 4Hz.
- For: CH1-25 to CH1-100 the natural frequency is 3 to 5Hz.



When mounting, the rubber cup and spring are removed so that the bent steel brackets can be mounted on the ceiling.







Туре	A [mm]	H [mm]	B Ø [mm]	C Ø [mm]	E [mm]	М
CH1-25	75	120	30	12	50	M8
CH1-50	75	120	30	12	50	M8
CH1-75	75	120	30	12	50	M8
CH1-100	75	120	30	12	50	M8
CH1-150	120	160	30	16	80	M12
CH1-250	120	160	30	16	80	M12
CH1-350	120	160	30	16	80	M12
CH1-500	140	180	30	18	100	M14
CH1-750	140	180	30	18	100	M14



Ceiling Hanger CHH1

### **Product description**

CHH1 is, among other things, designed for acoustic ceilings which are to be elastically suspended and for the vibration isolation of pipes and machines at speeds or frequencies of more than 300 rpm. Loads from 40-446 kg.

### **Components**

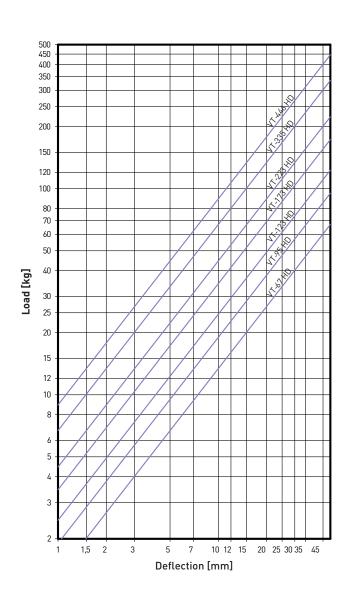
The ceiling bracket consists of a spring inserted into a bent steel bracket. The spring rests in a rubber cup which eliminates the transfer of high frequencies. All metal surfaces are galvanised.

### Flexible properties

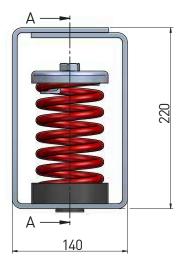
The vertical natural frequency of CHSR is down to 3.50 Hz.

### **Application**

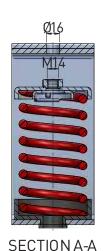
When mounting, the rubber cup and spring are removed so that the bent steel brackets can be mounted on the ceiling.











Max. load Deflection Spring colour Type [kg] [mm] CHH1-067 50 Blue 67 CHH1-095 95 50 White CHH1-123 50 Black 123 CHH1-173 50 173 Beige CHH1-223 50 223 Red CHH1-335 335 50 Grey CHH1-446 446 50 Green

Ceiling Hanger CHSR

### **Product description**

CHSR is, among other things, designed for acoustic ceilings which are to be elastically suspended and for the vibration isolation of pipes and machines at speeds or frequencies of more than 400 rpm. Loads from 15–125 kg.

### **Components**

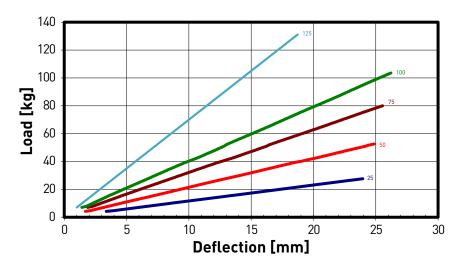
The ceiling bracket consists of a spring inserted into a bent steel bracket. The spring rests in a rubber cup which eliminates the transfer of high frequencies. All metal surfaces are galvanised.

### Flexible properties

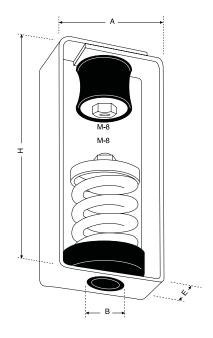
The vertical natural frequency of CHSR is down to 3.50 Hz.

### **Application**

When mounting, the rubber cup and spring are removed so that the bent steel brackets can be mounted on the ceiling.







Туре	Max. load [kg]	Deflection [mm]	Spring colour
CHSR-025	25	24	Blue
CHSR-050	50	24	Red
CHSR-075	75	24	Brown
CHSR-100	100	25	Green
CHSR-125	125	18	Light blue
CHSR-335	335	50	Grey
CHSR-446	446	50	Green

### **Product description**

CHJ is designed for acoustic ceilings which are to be suspended elastically or for the vibration isolation of pipes and machines at speeds or frequencies of more than 400 rpm. Loads from 25–350 kg.

### Components

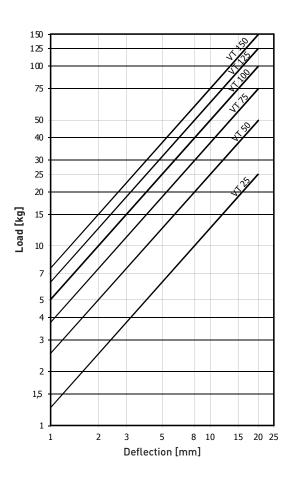
The ceiling bracket consists of a spring inserted into a bent steel bracket. The spring rests in a rubber cup which eliminates the transfer of high frequencies. All metal surfaces are galvanised

### Flexible properties

The natural frequency is 3 Hz or more.

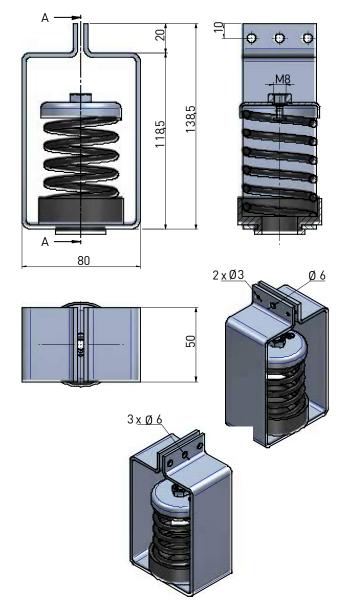
### **Application**

When mounting, the rubber cup and spring are removed so that the bent steel brackets can be mounted on the ceiling.



Туре	Max. load [kg]	Deflection [mm]	Spring colour
CHJ-025	25	20	Black
CHJ-050	50	20	Blue
CHJ-075	75	20	Grey
CHJ-100	100	20	Beige
CHJ-125	125	20	White
CHJ-150	150	20	Black





### Vibration isolation mounts

### **Product description**

Two adjustable electro-galvanised curved metal brackets with a vibration mount in-between The brackets make it possible to adjust the vibration mount's orientation so that maximum vibration isolation is achieved.

• Maximum axial load: 15-40 kg

Maximum axial deformation: 3.0 mm

• Maximum radial load: 4-8 kg

• Maximum radial deformation: 5.4 mm

### **Application**

Preferably for light equipment, such as suspended appliance cabinets, electronic control units, alarm systems, automation equipment, computers, etc., which are sensitive to shock and vibration.

Used for, among other things, protecting components in ship engine rooms and isolating against vibrations caused by fans, etc.

An installation with Rahbek 5 lets you set the natural frequency in the horizontal, vertical and lateral directions, giving you the possibility to optimise the vibration isolation in all of these directions.

### **Assembly**

The element is secured between the wall and the apparatus as shown in the figure to the right. The vibration mount's axis should pass through the apparatus' centre of gravity.

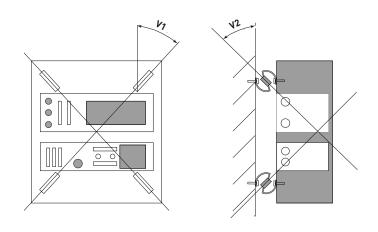
The installation's hardness, and thus natural frequency, can be adjusted by adjusting V1 and V2.

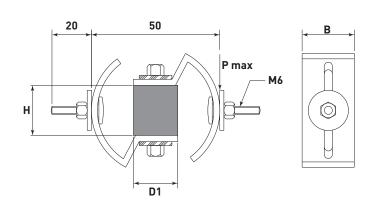
V1 and V2 should respectively be in the range of 0–45° and 22–45°.

The radial stiffness of the mount is 1/6 of the axial, and small radial loads are permissible.

Туре	D1 [mm]	H [mm]	P Max. [kg]	B [mm]
4	20	15	15	25
5	20	20	20	25
6	25	20	25	25
6a	30	25	32	25
7a	30	30	40	25







### VIKAS anti-vibration plate

### **Product description**

Anti-vibration mount rubber sheet moulded in neoprene rubber with a hardness of  $50^{\circ}$  IRH. The RG sheet is resistant to oil and is anti static.

The sheet has longitudinal grooves on one side and transverse grooves on the other.

### **Application**

The RG sheet is mainly used for isolation against vibrations from 40–50 Hz and above, i.e. in the audible frequency range.

The sheet is particularly suitable if the isolated machinery needs a relatively firm underlay, and at the same time isolation is required against structure-borne noise.

The sheet is used when installing tools, printing machinery, textile machinery, lift machinery and the like.

### **Assembly**

The RG sheet can usually be fitted between the machine and the underlay. In many cases, the rubber sheet renders bolting the machine redundant and thereby avoids bolt holes in floors and ceilings. If several sheets are layered, a 2 mm steel plate is placed between each layer.

The sheet is cut with a clean, sharp knife. The cut sheet should be 5-10 mm larger than the machine foot so that the ability to fastening it to the floor is greater.



### **Dimensioning**

The required sheet area is determined by the load. The normal static load distribution for RG8 is 3.5 kg/cm<sup>2</sup>, creating a deflection of approximately 1.2 mm.

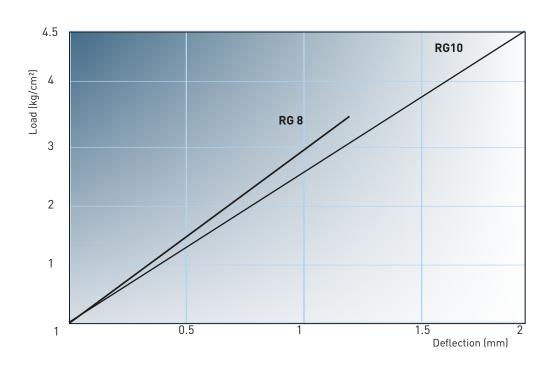
- Load in kg = RG8 sheet area (cm²) 3.5
- Load in kg = RG10 sheet area (cm<sup>2</sup>) 4.5

The RG8 sheet can absorb short-term loads of up to 4.3 kg/  $\mbox{cm}^2$ 

Larger deflection can be achieved by placing several sheets on top of each other.

### **Dimensions**

- RG8 500 x 500 x 8mm
- RG10 500 x 500 x 10mm



### **Product description**

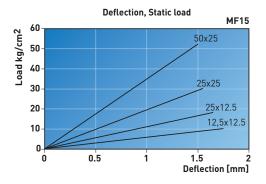
The sheet is manufactured in two versions – both have rubber hardnesses of  $45^{\circ}$  IRH.

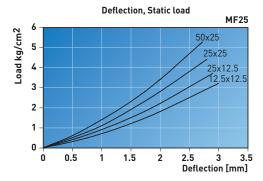
The Mafund sheet with transverse air ducts is 25 mm thick and provides a relatively large deflection. The sheet can absorb surface pressure of up to 5.4 kg/cm<sup>2</sup> and is made of SBR rubber.

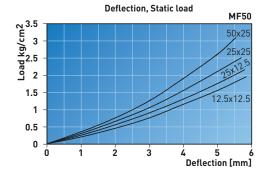
The solid Mafund sheet is 15 mm thick and is used for large surface pressures, since it can be loaded with up to 53 kg/cm² and is made of NR rubber

### **Application**

The Mafund sheet is used for vibration isolation of large and heavy machinery, typically under a concrete foundation. Furthermore, the sheets are used in buildings for noise/vibration isolation between the concrete elements.









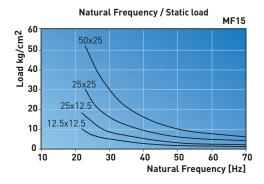
### **Dimensioning**

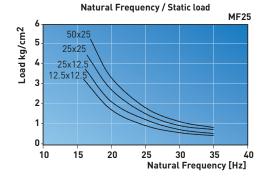
The normal static load distribution of Mafund holes is 5.4 kg/cm², providing a deflection of 2.7 mm.

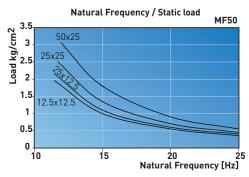
For both sheet types, larger deflections can be achieved by placing several sheets on top of each other.

### **Dimensions**

- MF15: 50 x 25 x 1.5 cm (Mafund solid)
- MF25: 50 x 25 x 2.5 cm (Mafund hole)
- MF50: 2 x MF25









# **SHOCK MOUNTS**

### General

### **Product description**

Mounts for shock loads are manufactured to allow great movement of the equipment which is to be shock dampened.

The mounts can be designed very differently and are available in many varieties, and shock calculations can be done for all of them.

### Two types of calculation can be carried out:

- System with one degree of freedom
- Simulation with infinite degrees of freedom

Calculations carried out with one degree of freedom are carried out free of charge, and if a detailed calculation and simulation is required, a quote is sent for this.

We can also offer full management of your shock-damping project, from prototyping to calculating the shock mounts to the final tested items with a test report.

For more information about our selection of shock mounts, please visit our website at:

### www.iac-nordic.dk













# Types

Military	Marine	Transport	Train
AECP-1	SMK DOC. 0103012-727	ASTM D4169	CE1373
DEF-STAN 00-35	AECTP200	ASTM D4728	EB50155
DEF-STAN 07-55	BV043	ASTM D999	NF01-510
DEF-STAN 81-41	BV044	GAM EMB1	NF6-002
GAM EG13	BV045	GAM EMBT4	RIA20
MIL-STD-810	BR3021	STANAG4280	
	D-03-003-007	STANAG4340	
	DNV95-0421		
	FNHQ		
	IEC945		
	IT1586		
	IT2521		
	IT9631		
	MIL-STD-167		
	MIL-STD-901		
	NAV-30-A001		
	RAR		
	STANAG4142		

Shock calculations are done according to the following standards and documents, among others:















FLOOR DAMPING, WALL MOUNTS AND CEILING HANGERS



### **Contents**

# Floor Damping





Pages 126 – 129

Wall Mount







Pages 130 – 133

Pages 133 – 135

# Ceiling Hangers





CHCE



### Acoustic solutions for floors, walls and ceilings

Floating floors are designed to reduce the impact of noise and vibration, thereby increasing the degree of comfort in rooms adjacent to noisy or vibrating activities such as fitness centres, bowling alleys, restaurants, cafes, discos and industrial halls.

Floating floors are also suitable for areas which require a low level of background noise, such as recording studios, cinemas, concert halls, anechoic chambers, rooms for precision measurements and buildings with offices where there is also industrial production.

A floating floor system consists of a floor made of two layers, separated by elements of a flexible material. The intermediate layer insulates the floor from the underlay, thereby providing soundproofing, as well as step sound isolation. Sound-absorbing material in the cavity further increases the soundproofing.

A floating floor can be a part of a room in a room solution, combined with the wall mount and ceiling mount. In situations with little flanking transmission, flexible

suspended ceilings or flexible supported walls provide excellent independent solutions for soundproofing. Flexible ceilings and wall mounts are also used. In order to achieve an optimum degree of isolation, consideration is made in each case of the nature of the stresses and the requirements to be met.

The principle behind IAC floating floors provides excellent soundproofing compared to other types of floor construction.

The R'w declaration for airborne sound isolation and the L'n, w declaration for step sound noise level are weighted values, wherein the low-frequency noise is weighted very low. This information is therefore not descriptive in situations where loud, modern music is being played with a high content of deep tones.

The advantages of a floating floor at these low frequencies, can, therefore, be substantially greater than the weighted standard indications suggest. This can be very important, as deep tones easily migrate long distances in buildings.

PUR foam VIKAFOAM

### **Product description**

VIKAFOAM is a cellular elastomer and made from a special type of polyether urethane elastomer. The product is used in mechanical engineering and the building industry as vibration isolation. Floating floors are made up of VIKAFOAM and concrete or wood, which together dampen sound and isolate vibrations particularly effectively. The system can be used for both large and small tasks, and is very flexible

### **Application**

VIKAFOAM is often used as a structure-borne noise damping material in buildings, both under individual building elements and when removing entire buildings from their foundations.

### **Damping**

The VIKAFOAM material provides uniform and well-defined damping. The internal damping for VIKAFOAM is determined by the mechanical loss factor. For VIKAFOAM, this value depends on the density, which can be from 0.1 to 0.3.

### Fire properties

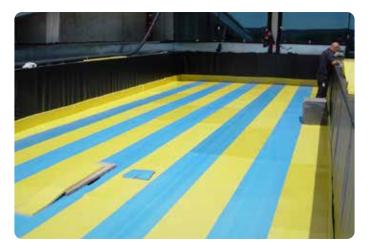
VIKAFOAM has been tested according to DIN 4102 and is in fire class B2 (normally flammable). In case of fire, no corrosive/caustic flue gases will occur. VIKAFOAM can to be considered like wood and wool in terms of its composition.

### Resistance to weather and chemicals

VIKAFOAM is resistant to substances such as water, concrete, oil, grease, dilute acids and alkalis.

SEE THE FULL RANGE UNDER VIBRATION-DAMPING SHEETS





Project photos



Microcell elastomer VIKACELL 400

### **Product description**

VIKACELL is a microcellular elastomer, which is extra flexible and can handle up to 75 %-80 % compression without damaging the material.

### **Application**

VIKACELL 400 is typically used for floating floors with high requirements for soundproofing. The material can also be used for the installation of machinery on a floating foundation, as well as the general setup of machines. The material has been developed for the automotive industry, where it is used as a mount in the suspension system, and it therefore can handle wide dynamic loading.

### **Damping**

The transmission of structure-borne noise with low frequencies through a floating floor can only effectively be dampened by designing the floating floor to have a very low natural frequency.

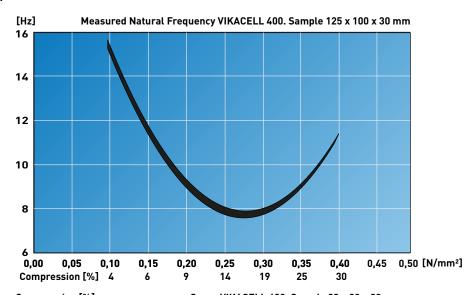
### **Advantages**

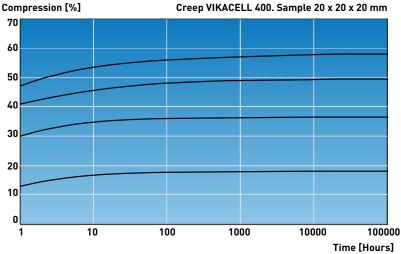
VIKACELL can be dimensioned to have a dynamic natural frequency of 8 Hz at a height of just 30 mm, which is less than half the height that other materials require to achieve the same natural frequency.



### **Assembly**

VIKACELL is typically used in blocks with the bearing capacity requirements and the requirements for the effectiveness of the isolation. Normal maximum static load  $0.45\ N\ mm^2$ .





Jack-Up Floor FZH

### **Product description**

FZH Jack Up System for concrete floors can be used in the recording studio, the office landscape and in the production hall. There may also be other locations where it is desired to reduce the nuisance from step sounds or other structure-borne noise coming into a room. The system also works the other way, so that step sounds or the sound of a drum set inside a studio is dampened optimally from the rest of the building.

### **Application**

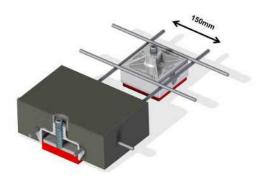
You can choose between 10 different mounts depending on the load they will be exposed to and the natural frequency of the floor you want. See the table of mounts below.

### Consumption

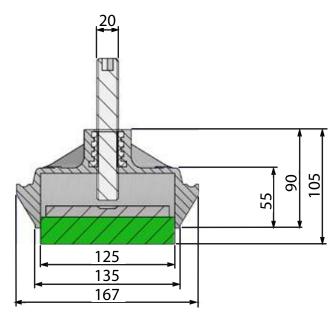
The consumption is about 1.12 damping per m<sup>2</sup>, which varies slightly relative to the concrete thickness and amount of reinforcement.

### **Advantages**

The system's clear advantage is that it ensures that there are no short circuits, because once the floor has been raised, there is no contact with the subfloor.







Туре	Load [Kg]	Natural frequency [Hz]
FZH140-25	140	11.3
FZH140-37	140	8.9
FZH240-25	240	11.2
FZH240-37	240	8.6
FZH490-25	490	10.5
FZH490-37	490	8.2
FZH800-25	800	11.9
FZH800-37	800	9.1
FZH965-25	965	11.7
FZH965-37	965	8.4

Steel floor STEEL FLOOR

### **Product description**

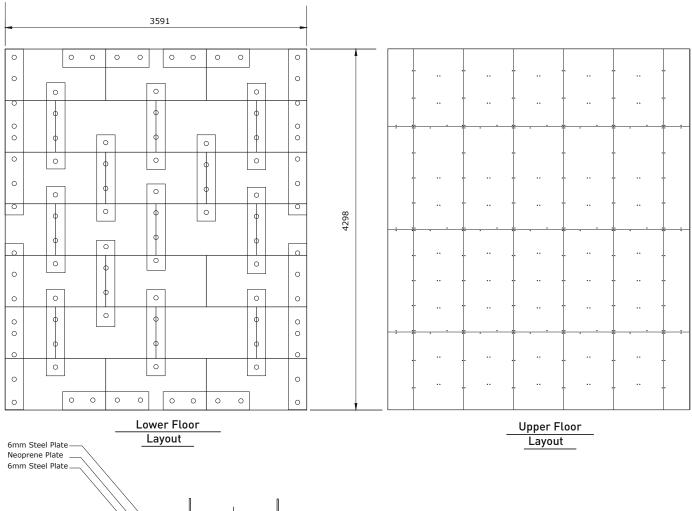
Low-profile steel floor made of 2 x 6 mm thick steel plates separated by neoprene rubber which rest on either VIKAFOAM or VIKACELL vibration mounts. These ensure that the floor is vibration-isolated against noise from the building's concrete floor. The noise from the building's concrete floor might originate in vibrations from step sounds or machines located in other parts of the building. The noise might also come from nearby train or subway lines or roads with heavy traffic.

The floating steel floor prevents airborne and structureborne noise from penetrating the room.

### Use

The total flooring construction has a height of 50 mm and the resonant frequency of vibrations of the rooms is less than 11 Hz. Damping at 60 Hz is at least 30 dB, and at 120 Hz it is more than 45 dB. The floor height can be raised to achieve a lower resonant frequency.

The floor's relatively low installation height makes it easier to customise access for wheelchair users, and it can be installed in most rooms while maintaining comfortable headroom.



Wall mount VBS-160

### **Product description**

Sound-absorbing wall mount. The suspensions are made of galvanised steel with a vibration isolator made of thermoplastic elastomer.

### **Application**

The wall bracket is used in securing the sound-absorbing secondary wall. The suspension is not designed to carry the wall, but to support it.

They are designed to work for both push and pull:

- Push: under varying loads up to 40 kg.
- Pull: under varying loads up to 30 kg.

Mechanical fire protection

### **Damping**

A sound-absorbing secondary wall reduces impact sounds by 8-12 dB, depending on the existing wall structure.

### **Advantages**

The wall mount isolates well in the midrange. A special version of the spring steel is optimal in the isolation of lower frequencies.

The wall mount is easy and quick to mount and can be used with different types of steel profile.

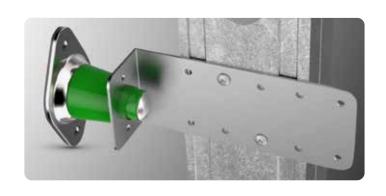
### **Assembly**

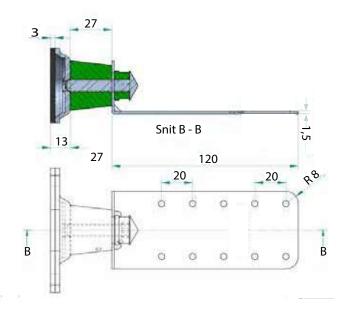
The wall can be established at WH (3 mm thick wall strips, p13) without a fixed connection to the existing walls and ceilings, as well as piping, etc.

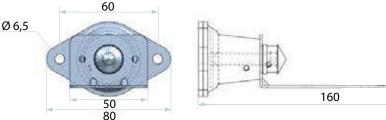
During assembly areas between the acoustic ceiling and walls, pipes, wires, etc. are sealed with a flexible jointing compound (acoustic jointing compound).

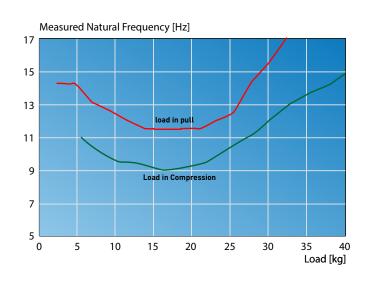
### Consumption

Approx. Six wall mounts per running metre of wall with a ceiling height of  $2.4-3.2\ m$ 









Wall strips RR

### **Product description**

Acoustic isolation for wall base rails. Wall strips are self-adhesive on one side, and are made of SBR fibres and granular rubber.

Wall strips provide good structure-borne noise isolation with a relatively small thickness.

### **Application**

Wall strips are used as a structure-borne noise damping material in buildings under plaster walls. Wall strips separate the plaster wall's base rail acoustically from the floor.

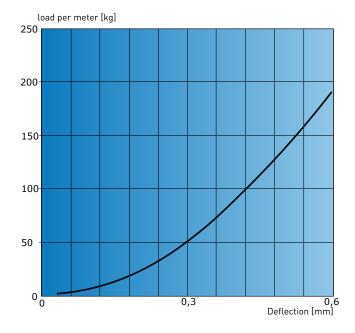
Wall strips are bonded under the plaster wall's base rail.

### Fire properties

Wall strips are in fire class B2 according to DIN 4102.

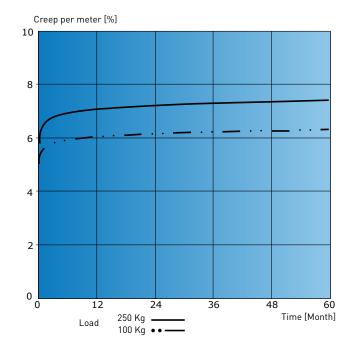
### **Specifications**

<ul> <li>Thickness</li> </ul>		3 mm
<ul><li>Width</li></ul>		50 mm
<ul> <li>Roll length</li> </ul>		20 m
<ul> <li>Dynamic stif</li> </ul>	fness per metre	3500 N/mm
<ul> <li>Typical botto</li> </ul>	om rail	MSK 45









### Ceiling Hanger / Wall bracket

### **Product description**

Two galvanised steel fittings separated by an anti-vibration mount. The ceiling mount and wall bracket isolate effectively against vibrations/audio transmission in the audible frequency range.

### **Application**

The ceiling mount can be used for sound insulation in association with suspended plaster ceilings.

The mount is designed to "support" and vibration-isolate the plaster ceiling against vibrations from the existing ceiling.

The wall bracket is used in securing the sound-absorbing secondary wall.

### **Damping**

The field measurements indicate that sound-absorbing ceilings improve sound absorption in the storey partition by up to 10 dB.

The R'w reduction value is typically 58-60 dB for a correctly fitted ceiling, but it depends on the existing ceiling construction.

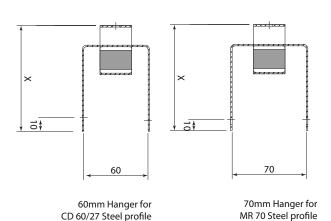
A sound-absorbing secondary wall reduces impact sound by 8–12 dB, depending on the existing wall construction.

### **Advantages**

- The ceiling mount and wall bracket provide optimal isolation against airborne noise.
- Fireproof construction. Covering class 1(DS 1065.2)
- Easy to install and can adjust for differences between the existing ceiling and wall

### Note

Dimension X can be from 65 to 1200 mm





### **Assembly**

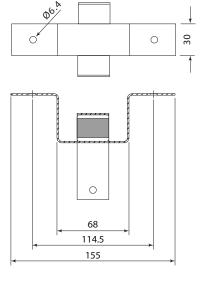
The acoustic ceiling must be freely suspended without direct connections to the existing walls, ceiling and piping, etc.

The soundproof wall is mounted without fixed connections to existing walls, ceiling and piping, etc.

Seal between the acoustic ceiling and the wall, pipes, wires, etc. with a flexible jointing compound.

### Consumption

- Approx. 1.4 ceiling mounts per m<sup>2</sup> of ceiling for two layers of plaster (~ Stress: approx. 18 kg/mount).
- Approx. 1.5 ceiling mounts per m<sup>2</sup> of ceiling for three layers of plaster (~ Stress: approx. 23 kg/mount).
- Approx. 4.5 wall brackets per running metre of wall (ceiling height 2.5-3.1m).



### **General**

The brackets are delivered unassembled and are comprised of the following parts:

### Ceiling mount

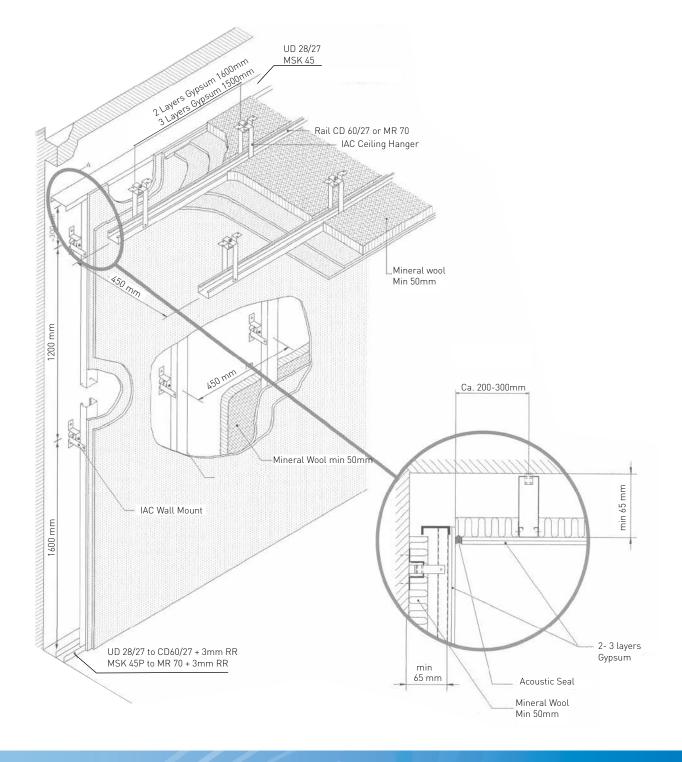
1 hat profile, anti-vibration mount incl. 2 screws and strap. Available in lengths from 65–1200 mm

### Wall mount

1 hat profile, 2 anti-vibration mounts incl. 1 screw, 1 pinol screw and strap. Available in lengths from 65–1200 mm

It is also important to include the following in the design:

- All joints, walls and penetrations must be soundproof.
   A flexible jointing compound must be used to seal.
- **2** Light fixtures etc. which penetrate the ceiling must be fitted with a soundproof superstructure.
- 3 If heavier things are suspended from the ceiling, additional ceiling mounts must be installed to accommodate the increased load. (Each mount must be loaded with a max. of 28 kg.)
- 4 If the secondary wall is loaded by hanging heavier objects, etc., it must be fitted with extra wall mounts.



# Ceiling Hanger / Click bracket elastomer

### **Product description**

Ceiling Hanger type Click bracket for suspended plaster ceilings. The Hangers are made of galvanised steel with a vibration isolator made of thermoplastic elastomer.

There are two types of Click brackets:

- GREEN for loads between 10 kg and 32 kg.
- BLUE for loads between 22 kg and 57 kg.

There are Click brackets for M6 and M8 threaded rods. The safety device can withstand loads higher than 326 kg. The service life is 30 years. EN 13964-2006.

### **Application**

The Click bracket is used for soundproofing in connection with suspended planar plaster ceilings. The bracket is designed to bear and vibration-isolate the plaster ceiling from the existing ceiling. They are suitable for loads of between 17 and 57 kg.

### **Damping**

Field measurements indicate that soundproof ceilings improve soundproofing in storey partitions by up to 10 dB. The R' reduction value is typically 64-70 dB for a correctly-mounted ceiling, but this depends on the existing ceiling construction.

### **Advantages**

The Click bracket isolates well in the middle tone range. A special version with steel springs is optimal in isolating lower frequencies. The click bracket is easy and quick to mount.

### **Assembly**

Assembly with the Click system is simple and fast. The brackets are mounted at the right height on threaded rods and the profiles click on. The fastening device is pushed into place with your finger, and the ceiling is completed.

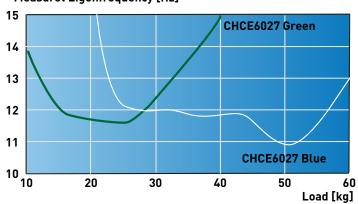
The acoustic ceiling must be freely suspended and without direct connections to the other walls, ceiling and piping, etc.

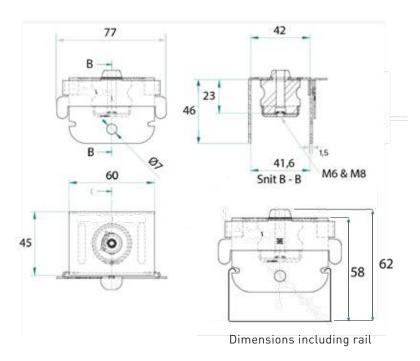
### Consumption

Crucial to the choice of type and number of ceiling Hangers will often be the deflection of the 60/27 profiles. The choice will often fall on the green type.



### Measuret Eigenfrequency [Hz]





### **Product description**

Hanger for soundproofing ceilings like with plaster board ceilings suspended in 60/27 profiles. The Hangers are made of galvanised steel with steel springs and thermoplastic elastomer for vibration isolation.

The Click suspensions come in four types:

- GREY for loads between 3 and 15 kg
- GREEN for loads between 15 and 30 kg
- BLUE for loads between 30 and 51 kg
- RED for loads between 50 and 76 kg

There are Click mounts for M6 and M8 threaded rods. The safety device can withstand loads higher than 326 kg. The service life is 30 years. EN 13964-2006.

### **Application**

The Ceiling Hanger is used for soundproofing in connection with suspended planar plaster ceilings. The Hanger is designed to support and vibration-isolate the plaster ceiling against vibrations from the existing ceiling. They are suitable for loads between 3–76 kg.

### **Damping**

Laboratory measurements show that soundproof ceilings in a spring mount improve soundproofing in storey partitions by as much as 30 dB.

The R'w reduction value is typically 68-74 dB for a correctly fitted ceiling, but this depends on the existing ceiling construction.

In practice, the improvement will be somewhat less dependent on the ceiling construction and flanking transmission through walls.

### **Advantages**

The ceiling mount isolates well throughout the entire audible frequency range – even for low tones. The ceiling mount is simple and quick to install.

### **Assembly**

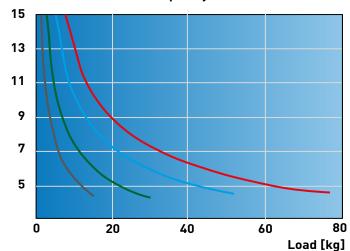
Assembly with the click system is simple and fast. The suspensions are mounted at the correct height on threaded rods and the profiles click on.

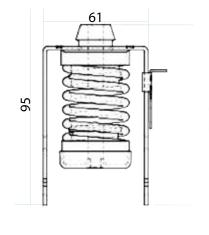
The fastening device is pushed into place with your finger, and the ceiling is completed.

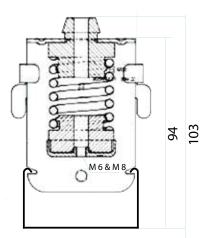
The acoustic ceiling must be freely suspended and without direct connections to the other walls, ceiling and piping, etc.



### Measuret Natural Frequency [Hz]







Dimensions including rail



Case

### Floating floors shield staff against noise

IAC Nordic got involved from the design phase of Amager Bakke. The consultative body of the building asked IAC Nordic for advice in relation to noise control in the building. The two parties started a dialogue about which floors could be developed to achieve minimal noise for the staff who have to do their daily work at the Waste to Heat plant.

We were contacted to clarify whether this was possible due to a very low installation height. In collaboration with the consultant we determined that it was, but it would put extreme demands on the material, says Jens Junker, project manager at IAC Nordic.

IAC Nordic specialises in developing customised solutions. The company therefore won the contract with their design of a floating floor which could dampen vibrations/noise from the Waste to Heat plant's production and keep the sound out of the part of the building where the staff work. IAC Nordic chose to use the Vikacell material, which is a material that can cope with up to 80 % compression without damaging the material. For comparison, other known materials can cope with approximately 10 %, and Vikacell can therefore achieve the same natural frequency as other materials but with a substantially smaller material height.

IAC Nordic had to lay almost 3700 km2 of floor, spread across eight floors. It was the first time IAC Nordic had used Vikacell in such a big project, and the company chose to

test the material in a test laboratory in Germany before the project began.

Because the task at Amager Bakke was so complicated, we tested the material in-house and in Germany to identify the dynamic properties and to be sure that it behaved as we had expected, says Jens Junker.

Vikacell proved to be such a good material to work with that IAC Nordic has now decided to use it as an integral part of the company's portfolio.

IAC Nordic worked on the construction for just over three years, which is the longest time the company has been assigned to the same project.

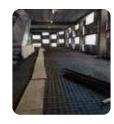
- We went back and forth from the construction site many times. It's a big building, so it takes a lot of coordination to make sure all the contractors can work without being in each others' way. That's why it took a long time for us to lay the last of the floor on the 10th floor, says Jens Junker and continues;
- But it was a great experience to be a part of and to see the building take shape. It's a fantastic building, and you can't help but be impressed with the complexity of the structure inside and with the building's general look, says Jens Junker.

















**VIBRATION DAMPING SHEETS** 



# **Contents**

**Technical** 







VIKAFOAM

**VIKAFOAM** Page 146 – 171



VIKAFOAM

Page 172 – 185 – VIKADYN



### **About VIKAFOAM**

### The material and its physical properties

"Due to its properties, VIKAFOAM is suitable for almost any application."

VIKAFOAM is a cellular elastomer made of a special kind of polyetherurethane. Elastomer springs are used in mechanical engineering and in the construction sector to isolate and/or damp vibration levels. Vikafoam elastomers exhibit outstanding characteristics as both pressure and compression-loaded springs.

For almost every application, there are 13 basic types of VIKAFOAM available, ranging from VF 10 to VF 1900 (Fig. 1). The desired requirements can be achieved easily through an appropriate selection of VIKAFOAM types, support surface area and construction height.

VIKAFOAM is available as mats for max-imum floor coverage, but can also be obtained in the form of technical moulded parts.

If necessary, special types with exactly matched strength can be produced. This defines special properties for the material. In contrast to non-cellular elastomers, the fine cellular structure of VIKAFOAM contains enclosed volumes of gas. This makes the material volume-compressible in response to static as well as to dynamic loads. It is therefore suitable for use on large surface areas in constructions made of locally mixed concrete.

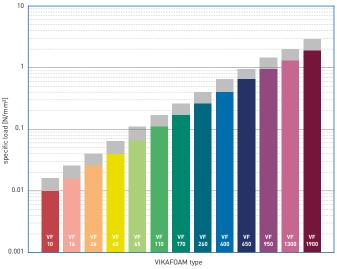


Fig. 1: The VIKAFOAM materials

### The static load deflection curve

Fig. 2 shows the quasi-static load deflection curve from a pressure test conducted on VIKAFOAM material.

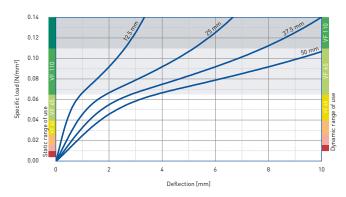


Fig. 2: Quasi-static load deflection curve of a VIKAFOAM material (VF 65)

Under low compression, the material exhibits an almost linear characteristics curve. The long-term static loading of these flexible bearings should lie within this range. The left scale shows the optimum static application range for each type of VIKAFOAM.

As loading on these bearings increases, the spring characteristic curve trends downwards (light-grey area). Vikafoam reacts in a very soft way to additional static and dynamic forces. In this dynamic application range, vibration isolation is at an optimum level. The right-hand scale indicates the optimum dynamic range for each type of VIKAFOAM.

As compression levels rise, the characteristic curve follows a progressive line (dark grey area). Due to the specific properties of VIKAFOAM, the material is unaffected by brief peak loads. The polymer structure also makes it possible, after brief high peak loads, for the material to return almost to its original position. The compression set defined in EN ISO 1856 is less than 5% for most types of VIKAFOAM (please refer to the product data sheets for more precise details).

### **About VIKAFOAM**

### The dynamic properties

Fig. 3 shows the relationship between the quasi-static and the dynamic modulus of elasticity (for 10 Hz and 30 Hz) at given load levels.

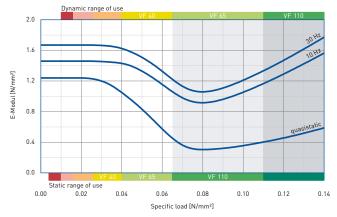


Fig. 3: Modulus of elasticity of a VIKAFOAM material (VF 65)

Due to its polymer structure, the intrinsic damping in VIKAFOAM causes the dynamic modulus of elasticity to exhibit higher values than the static modulus of elasticity. Depending on frequency and compression level, the strength reinforcement factor of VIKAFOAM materials measures 1.5 - 4.

The characteristic curve shown here for the quasi-static and the dynamic modules of elasticity indicates a minimum in the central dynamic application area. Despite slight spring compression action, the material at this minimum still exhibits optimum vibration-isolating properties.

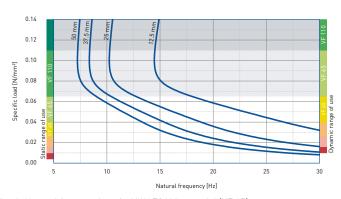


Fig. 4: Natural frequencies of a VIKAFOAM material (VF 65)

The dynamic characteristics of the modulus of elasticity is frequency-dependent. In practice, a good approximation for most applications is to select the dynamic modulus of elasticity for 10 Hz. Fig. 4 shows the computed natural frequency of a system comprising a compact mass and a flexible mounting made of VIKAFOAM, dependent on load (basis: dynamic modulus of elasticity at 10 Hz). The desired natural frequency of the system can be achieved through an appropriate choice of construction height.

### The damping characteristics

VIKAFOAM materials are damped spring elements. This means that, when VIKAFOAM materials are subjected to alternating dynamic loads, a proportion of the mechanically introduced energy is converted into heat. The damping characteristics are described by the mechanical loss factor  $\eta$  .

For VIKAFOAM materials, these values are between 0.09 and 0.25 (please consult the product data sheets for more precise details).



### **About VIKADYN**

### The material and its physical properties

"Due to its superlative dynamic properties, Vikadyn is also suitable for exceptionally challenging applications."

VIKADYN is a closed-cell elastomer and it is made of a special kind of polyetherurethane. Thanks to its structure, this material absorbs almost no fluids and can therefore be used in pressing groundwater. There are 5 basic types of VIKADYN, VD 75 to VD 1500, to suit virtually any application scenario (Fig. 5). The desired requirements can be achieved easily through an appropriate selection of VIKADYN types, support surface area and construction height.

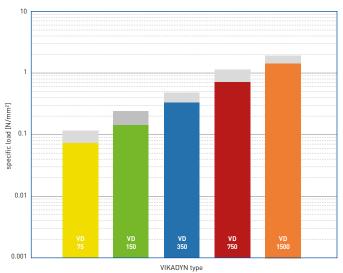


Fig. 5: The VIKADYN materials material

### The static load deflection curve

Fig. 6 shows the quasi-static load deflection curve from a pressure test conducted on VIKADYN material.

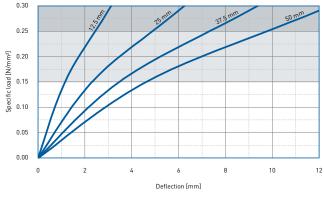


Fig. 6: Quasi-static load deflection curve of a VIKADYN material (VD 150)

As with the VIKAFOAM types, the load deflection curve of VIKADYN types can be sub-divided into three areas. The linear characteristic curve in the static working area follows a "degressive", i.e. downward-trending characteristic curve in the dynamic operating range (light grey area). At higher levels of compressive force, the characteristic curve begins to follow a "progressive", i.e. upward-trending line (dark grey area).

### The dynamic properties

Fig. 7 shows the quasi-static and the dynamic modulus of elasticity (for 10 Hz and 30 Hz) at given load levels.

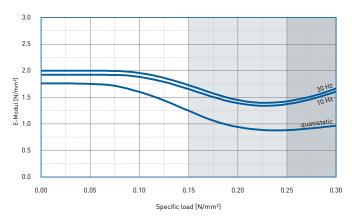


Fig. 7: Modulus of elasticity of a VIKADYN material (VD 150)

VIKADYN materials exhibit very small rigidity-reinforcing factors and are therefore suitable for vibration-isolating applications, even when these involve high dynamic requirements.

Fig. 8 shows the calculated natural frequency of a system consistent of a compact mass and an elastic bearing made of Vikadyn, dependent upon the loading level (basis: dynamic modulus of elasticity at 10 Hz). With VIKADYN, the systems involved in vibration damping can be tuned very low. This achieves highly effective vibration isolation.

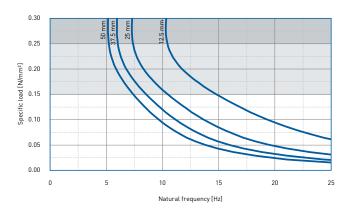


Fig. 8: Natural frequencies for a VIKADYN material (VD 150)

### The damping characteristics

Vikadyn materials have very low levels of damping. The mechanical loss factor  $\eta$  for all types of VIKADYN is less than 0.06 (please refer to the product data sheets for more precise details).



### Shared properties and fundamentals of vibration isolation with elastomers



### The shear modulus

Structural bearings made of VIKAFOAM/VIKADYN materials can be also subjected to shear forces. Always ensure that the shear modulus is less than the corresponding modulus of elasticity. This applies to dynamic as well as to static loadings. You can find information about these shear moduli in the relevant product data sheets. The quasi-static shear characteristic curve describes a relatively linear path.

### The form factor

The rigidity and/or the load deflection curve of the cellular elastomer is dependent in part on the volumetric compressibility level of the VIKAFOAM/VIKADYN material. The more compact the types of VIKAFOAM/VIKADYN are, the lower are their respective levels of volumetric compressibility. The parameter of form factor q (= surface subjected to load/curved surface area) makes it possible to determine the values for suspension action, dynamic modulus of elasticity and natural frequency for the prevailing geometry of the bearing. The dependent relationships between these properties and the form factor are itemised on page 3 of the product data sheets for each type of VIKAFOAM/VIKADYN. These figures serve as correction values to the graphs on page 2 of the data sheets.

# Static and dynamic properties when subject to continuous load

Elastic vibration bearings tend to exhibit load-dependent creepage characteristics. A continuous high level of load can alter the static and dynamic properties of an elastomer. However, the limit values stipulated for VIKAFOAM/VIKADYN are selected for the permitted levels of load in such a way that no significant change in the dynamic modulus of elasticity does occur, even over very long periods of time.

### Influence of temperature

The operational temperature range of VIKAFOAM/VIKADYN materials should lie between -30°C and +70°C. The details provided in the product data sheets apply to normal climates (room temperature). Temperature-dependent changes in the dynamic modulus of elasticity at different temperature are itemised in the detailed data sheet, and must be considered in the design.

### Dependency on amplitude

The dynamic properties of VIKAFOAM/VIKADYN materials are only slightly dependent on amplitude (see detailed data sheet) so this factor can be treated as insignificant.

### Fire characteristics

The classification of VIKAFOAM/VIKADYN materials is defined in DIN EN ISO 11925-1 as Class E (EN 13501-1). There is no risk of corrosive gas fumes being created in the event of fires. The composition of these materials is similar to that of organic materials such as wood or wool.

# Resistance to environmental influences and to chemicals

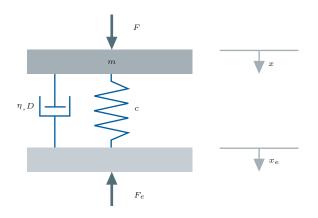
VIKAFOAM/VIKADYN materials are resistant to water, concrete, oils, and to diluted acids and lyes. More precise information about their resistance to environmental conditions and to chemicals can be found in the data sheet "Stability against chemical influences"

### Vibration isolation

The transmission of undesirable mechanical vibrations to the structure requiring protection can be reduced by the right choice of vibration isolation material. With the help of a damped spring, depending on the type of insulation, the source can be isolated from the receiver, or vice versa. Since VIKAFOAM/VIKADYN materials are 'visco-elastic' construction elements, they perform the role of a damped/ slightly damped spring.

### The simple computational model

The simply physical model of a one-dimensional massspring system (Fig. 9) can be used to analyse many vibration problems.



F	acting dynamic force	[N]
m	oscillating mass	[kg]
c	dynamic spring constant	[N/mm]
$F_e$	dynamic contact force	[N]
x	deflection of the mass	[mm]
$x_e$	dynamic deflection of the abutment	[mm]
η	mechanical loss factor	[ ]
D	Lehr's damping factor	[ ]

Fig. 9: One-dimensional mass-spring system



# Fundamentals of vibration isolation with elastomers

A free linear-damped oscillation is described by the following equation of motion:

### Formula 1

$$\ddot{x} + 2 \cdot D\omega_0 \dot{x} + \omega_0^2 x = 0$$

$\dot{x}, \ddot{x}$	first or second derivative of deflection with respect to time	[mm/s], [mm/s²]
$\omega_0$	natural angular frequency of an undamped oscillation	[1/s]

The following relationship exists between the mechanical loss factor  $\eta$  and damping factor:

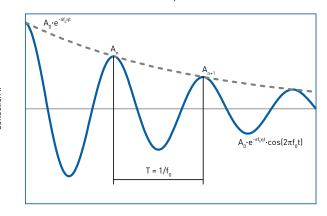
### Formula 2

$$\eta = 2 \cdot D$$

If the mass is moved out of its rest position by an external force applied for a short time, this causes free, damped oscillations to occur at natural frequency f (Fig. 10). In a first approximation, the natural frequency of the damped system f' is essentially equal to the natural frequency of the undamped system f0 ( $\eta^2/4 \ll 1$ ):

### Formula 3

$$f_0 = \frac{\omega_0}{2 \cdot \pi} = \frac{1}{2 \cdot \pi} \sqrt{\frac{c}{m}} = \frac{1}{T}$$



time t

Fig. 10: Free damped vibration

f	excitation frequency	[Hz]
f'	natural frequency of a damped oscillation	[Hz]
$f_0$	natural frequency of an undamped oscillation	[Hz]
T	period duration	[s]
t	time	[s]

Due to the damping action, amplitude declines over time. The speed at which the amplitude diminishes depends on the damping or the mechanical loss factor. The relationship between damping and the ratio of two consecutive amplitude maximums is provided by:

### Formula 4

$$\frac{A_{n+1}}{A_n} = e^{-2 \cdot D\pi} = e^{-\eta \pi}$$

$A_n$ amplitude of the n-th oscillation [mm]
--

### Transfer function

If the mass is excited into oscillation by a periodic force F with an amplitude of  $\hat{F}$  and an excitation frequency f this gives rise to oscillations with an amplitude of  $\hat{x}$ :

### Formula 5

$$\hat{x} = \frac{\hat{F}}{c} \frac{1}{\sqrt{\left[1 - \left(\frac{f}{f_0}\right)^2\right]^2 + \eta^2 \left(\frac{f}{f_0}\right)^2}}$$

$\hat{x}$	deflection amplitude of a driven oscillation	[mm]
$\hat{F}$	amplitude of the acting dynamic force	[N]

In its attenuated condition, the mass oscillates at excitation frequency f. The excessive increase in amplitude at the resonance frequency of the system depends upon mechanical damping. Due to the damping action available in VIKAFOAM/VIKADYN materials, this peak of amplitude is however only small in magnitude.

Vibration isolation is described by transmission function V. With force excitation (source insulation) the ratio of dynamic mounting force  $\hat{F}_e$  and the reciprocal force excitation level  $\hat{F}$  are indicated. In contrast, with travel excitation (receiver isolation), the amplitude ratio of mass  $\hat{x}$  and of the substrate  $\hat{x}_e$  is considered. The transfer function therefore yields the mathematical relationship between the system response and the action exerted thereon, and is dependent on frequency ratio  $f/f_0$  and on the damping.

### Formula 6

$$V = \sqrt{\frac{1 + \eta^2 \left(\frac{f}{f_0}\right)^2}{\left[1 - \left(\frac{f}{f_0}\right)^2\right]^2 + \eta^2 \left(\frac{f}{f_0}\right)^2}}$$

V transfer function [ ]

The effectiveness of an elastic bearing is frequently quoted as an insulation efficiency rating I in percent or as transmission factor L in dB.

### Formula 7 and 8

$$I = 100 \cdot \left[ 1 - \sqrt{\frac{1 + \eta^2 \left(\frac{f}{f_0}\right)^2}{\left[1 - \left(\frac{f}{f_0}\right)^2\right]^2 + \eta^2 \left(\frac{f}{f_0}\right)^2}} \right]$$

$$L = 20 \cdot log \left[ \sqrt{\frac{1 + \eta^2 \left(\frac{f}{f_0}\right)^2}{\left[1 - \left(\frac{f}{f_0}\right)^2\right]^2 + \eta^2 \left(\frac{f}{f_0}\right)^2}} \right]$$

I	isolation efficiency rate	[%]	
L	transmission factor	[dB]	

## Fundamentals of vibration isolation with elastomers

Fig. 11 illustrates the transmission factor for three different mechanical loss factors. An insulation effect is only provided for frequency range  $f/f_0 > \sqrt{2}$ .

Below the  $\sqrt{2}$  multiple of resonance frequency, mechanical vibration levels are amplified by physically induced amplitude peaks.

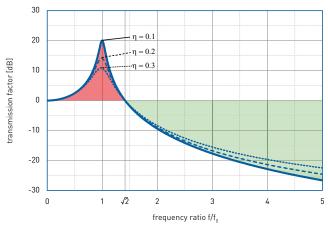


Fig. 11: Transmission factor for various mechanical loss factors

# Natural frequency and damping action of vibration systems with VIKAFOAM/VIKADYN

For the simplest design scenario, involving a vibration bearing with a type of VIKAFOAM/VIKADYN in accordance with the static design rating for compressive force, the computed natural frequency can be obtained by consulting page 2 of the product data sheets.

The calculation of natural frequency involves formula 3. Here, the dynamic spring constant of the bearing is determined as follows:

#### Formula 9

$$c = \frac{EA}{d}$$

E	dynamic modulus of elasticity	[N/mm²]
A	contact surface area	[mm²]
d	material thickness	[mm]

As an alternative to formula 3, the following formula can be used:

#### Formula 10

$$f_0 = 15.76 \cdot \sqrt{\frac{E}{d\sigma}}$$

The modulus of elasticity E to be used for the corresponding surface pressure can be found on page 2 of the product data sheets. When calculating the dynamic spring constant using formula 9, and natural frequency using formula 10, ensure that the material thickness for VIKAFOAM/VIKADYN should be applied in unloaded condition. For sequential switching and/or for a combination of elastomer springs, the natural frequency obtained using formula 3 must be computed from the level of total rigidity. This computational model is also valid for shear loads. However, in this case the dynamic shear modulus should be used.

The isolation level and isolation value of the elastic bearing can be calculated using formula 7 and formula 8 for the corresponding frequency ratio as a function of the prevailing mechanical loss factor. These two parameters, dependent upon natural and interference frequency, are illustrated for the simplified case  $(\eta=0)$  in the detailed data sheet.

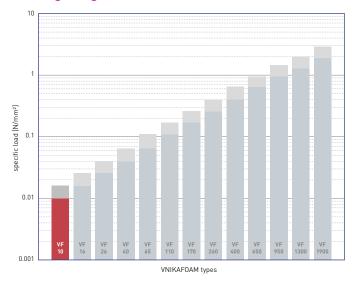
The calculation of natural frequency, assisted by static suspension action as applied to the design of forms of undamped vibration isolation (e.g. steel springs) is not suitable for calculating the natural frequency of a VIKAFOAM/VIKADYN bearing.

# Modelling

The modelling of a vibration system with one degree of freedom is usually enough to create a mechanical one-dimensional analogous model of the mass-spring system. This presupposes theoretically dynamic infinitely rigid and compact masses and a dynamically rigid foundation. This case generally applies to excitation masses that are very small compared to the mass of the foundation, as a first approximation. Here it is usually sufficient to know the lowest resonant frequency of the system.

When linked to structures with many other discrete individual masses and springs, additional natural frequencies can be observed. It can be advisable to extend the model in a suitable manner for this case. Particularly high levels of isolation efficiency can for example be achieved by using a dual-mass vibration

## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

0.010

Dynamic load: up to [N/mm²]

0.016

Load peaks: up to [N/mm²]

0.5

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material mixed cellular polyether-urethane

Colour red

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions 2.000 x 500 mm

Properties	Value	Test method	Comment
Mechanical loss factor (1)	0.25	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	0.048 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	0.144 N/mm <sup>2</sup>	DIN 53513 <sup>(2)</sup>	
Static shear modulus (1)	0.04 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.01 N/mm²
Dynamic shear modulus [1]	0.09 N/mm <sup>2</sup>	DIN 53513 <sup>(2)</sup>	preload 0.01 N/mm², 10 Hz
Resistance to strain	0.011 N/mm²		at 10% deformation
Residual compression set	< 5 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 0.35 N/mm <sup>2</sup>	DIN 53455-6-4	minimum
Elongation at break	> 400 %	DIN 53455-6-4	minimum
Tear resistance	> 0.6 N/mm	DIN ISO 34-1/A	
Rebound elasticity	50 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>12</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.05 W/[m·K]	DIN 52612-1	
Operating temperature	-30 to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

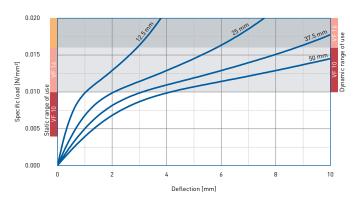
<sup>[1]</sup> measured at maximum limit of static application range



 $<sup>^{\</sup>mbox{\scriptsize (2)}}$  test according to DIN 53513

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

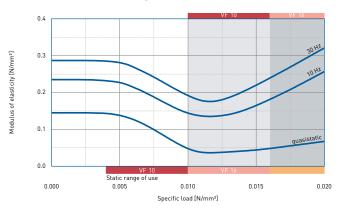
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

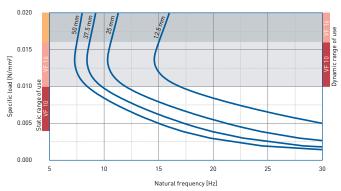
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of ± 0.22 mm at 10 Hz and ± 0.08 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

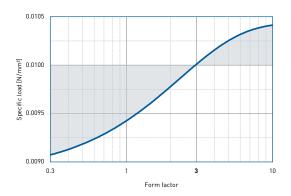
# Natural frequency based on the Modulus of elasticity @ 10Hz



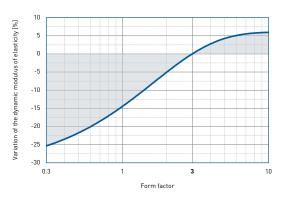
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKAFOAM VF 10 on a stiff subgrade.

Form factor q = 3

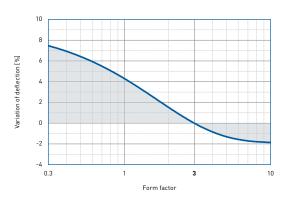
## Static load range

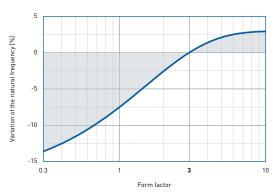


# Dynamic modulus of elasticity @ 10Hz



#### **Deflection**

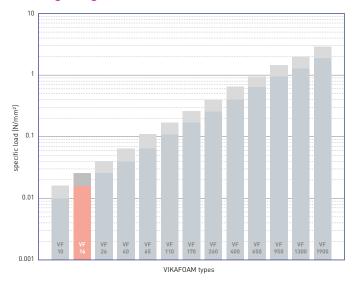




Correction values varying form factors specific load 0.01 N/mm<sup>2</sup>. Form factor q = 3



## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

0.016

Dynamic load: up to [N/mm²]

0.026

Load peaks: up to [N/mm²]

0.7

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material mixed cellular polyether-urethane

Colour pink

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions 2.000 x 500 mm

Properties	Value	Test method	Comment
Mechanical loss factor (1)	0.24	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	0.111 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	0.328 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus (1)	0.07 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.016 N/mm²
Dynamic shear modulus [1]	0.14 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.016 N/mm², 10 Hz
Resistance to strain	0.018 N/mm²		at 10% deformation
Residual compression set	< 5 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 0.40 N/mm <sup>2</sup>	DIN 53455-6-4	minimum
Elongation at break	> 400 %	DIN 53455-6-4	minimum
Tear resistance	> 0.7 N/mm	DIN ISO 34-1/A	
Rebound elasticity	50 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10¹² Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.05 W/[m·K]	DIN 52612-1	
Operating temperature	-30 to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

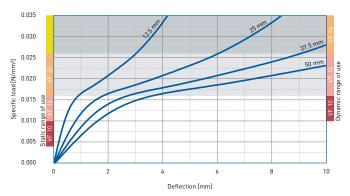
<sup>[1]</sup> measured at maximum limit of static application range



 $<sup>^{\</sup>mbox{\tiny [2]}}$  test according to DIN 53513

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

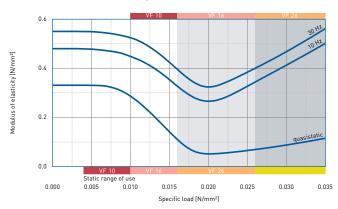
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

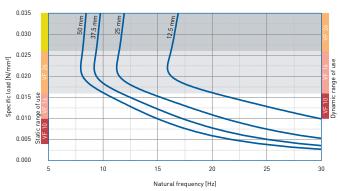
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of ± 0.22 mm at 10 Hz and ± 0.08 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

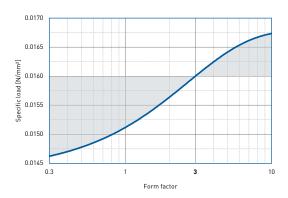
# Natural frequency based on the Modulus of elasticity @ 10Hz



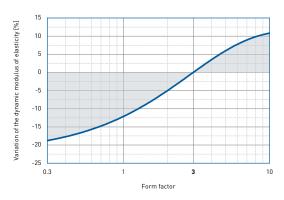
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKAFOAM VF 16 on a stiff subgrade.

Form factor q = 3

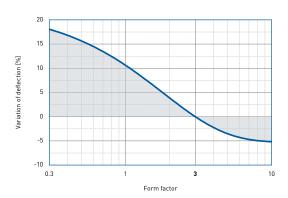
## Static load range

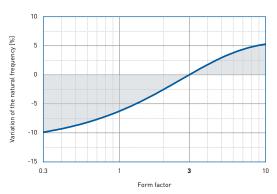


# Dynamic modulus of elasticity @ 10Hz



#### **Deflection**

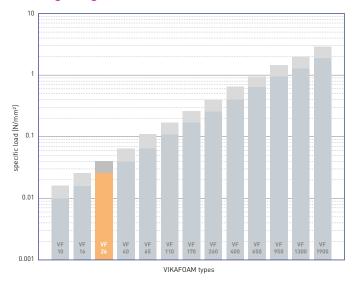




Correction values varying form factors specific load 0.016 N/mm<sup>2</sup>. Form factor q = 3



## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

0.026

Dynamic load: up to [N/mm<sup>2</sup>]

0.040

Load peaks: up to [N/mm²]

1.0

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material mixed cellular polyether-urethane

Colour orange

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions 2.000 x 500 mm

Other dimensions on request (also stamping and moulded parts).

Properties	Value	Test method	Comment
Mechanical loss factor (1)	0.22	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	0.129 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	0.443 N/mm <sup>2</sup>	DIN 53513 <sup>(2)</sup>	
Static shear modulus (1)	0.09 N/mm <sup>2</sup>	DIN 53513 <sup>(2)</sup>	preload 0.026 N/mm²
Dynamic shear modulus [1]	0.17 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.026 N/mm², 10 Hz
Resistance to strain	0.026 N/mm²		at 10% deformation
Residual compression set	< 5 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 0.45 N/mm <sup>2</sup>	DIN 53455-6-4	minimum
Elongation at break	> 400 %	DIN 53455-6-4	minimum
Tear resistance	> 0.9 N/mm	DIN ISO 34-1/A	
Rebound elasticity	50 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.06 W/[m·K]	DIN 52612-1	
Operating temperature	-30 to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

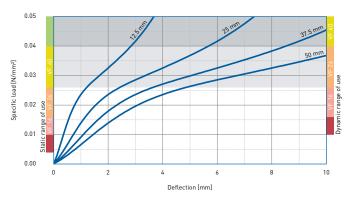
<sup>[1]</sup> measured at maximum limit of static application range

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.



<sup>&</sup>lt;sup>(2)</sup> test according to DIN 53513

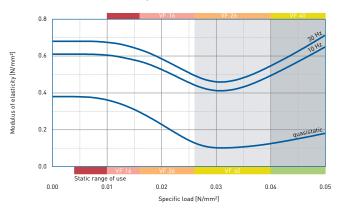
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

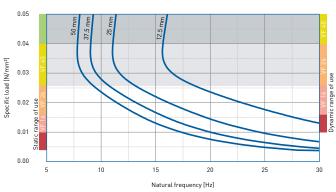
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of ± 0.22 mm at 10 Hz and ± 0.08 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

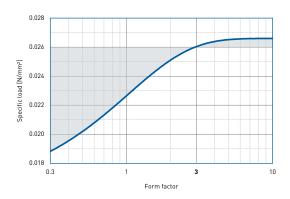
# Natural frequency based on the Modulus of elasticity @ 10Hz



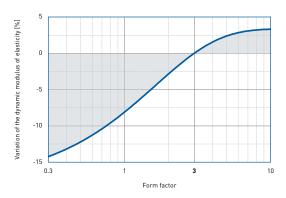
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKAFOAM VF 26 on a stiff subgrade.

Form factor q = 3

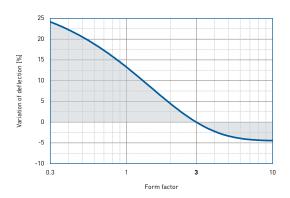
## Static load range

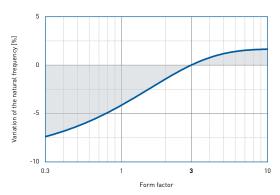


# Dynamic modulus of elasticity @ 10Hz



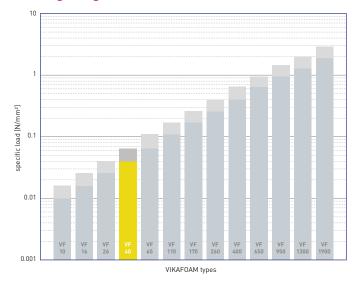
#### **Deflection**





Correction values varying form factors specific load  $0.026 \text{ N/mm}^2$ . Form factor q = 3

## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

0.040

Dynamic load: up to [N/mm<sup>2</sup>]

0.065

Load peaks: up to [N/mm²]

2.0

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material mixed cellular polyether-urethane

Colour yellow

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions 2.000 x 500 mm

Other dimensions on request (also stamping and moulded parts).

Properties	Value	Test method	Comment
Mechanical loss factor (1)	0.15	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	0.316 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	0.743 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus [1]	0.13 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.04 N/mm²
Dynamic shear modulus [1]	0.24 N/mm <sup>2</sup>	DIN 53513 <sup>(2)</sup>	preload 0.04 N/mm², 10 Hz
Resistance to strain	0.046 N/mm²		at 10% deformation
Residual compression set	< 5 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 0.55 N/mm <sup>2</sup>	DIN 53455-6-4	minimum
Elongation at break	> 400 %	DIN 53455-6-4	minimum
Tear resistance	> 1.1 N/mm	DIN ISO 34-1/A	
Rebound elasticity	50 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.07 W/[m·K]	DIN 52612-1	
Operating temperature	-30 to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

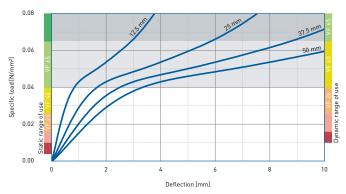
<sup>[1]</sup> measured at maximum limit of static application range

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.



<sup>&</sup>lt;sup>(2)</sup> test according to DIN 53513

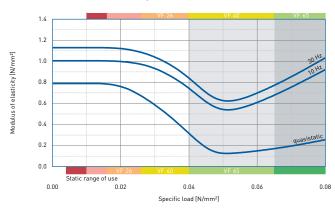
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

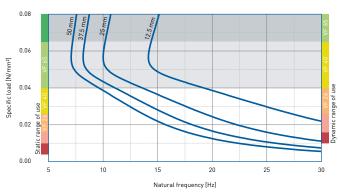
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of ± 0.22 mm at 10 Hz and ± 0.08 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

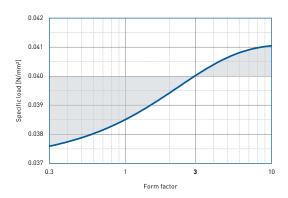
# Natural frequency based on the Modulus of elasticity @ 10Hz



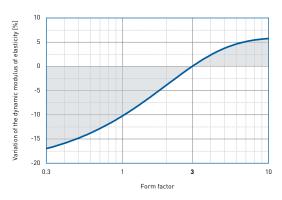
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKAFOAM VF 40 on a stiff subgrade.

Form factor q = 3

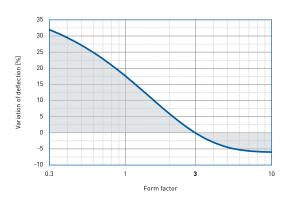
## Static load range

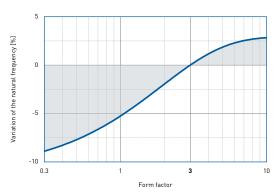


# Dynamic modulus of elasticity @ 10Hz



#### **Deflection**

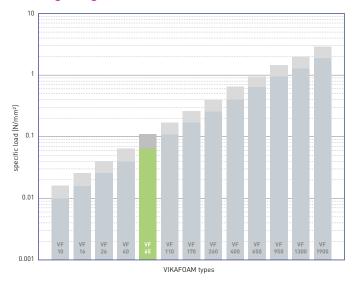




Correction values varying form factors specific load  $0.04 \text{ N/mm}^2$ . Form factor q = 3



## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

0.065

Dynamic load: up to [N/mm<sup>2</sup>]

0.110

Load peaks: up to [N/mm²]

2.5

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material mixed cellular polyether-urethane

Colour bright green

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions 2.000 x 500 mm

Properties	Value	Test method	Comment
Mechanical loss factor (1)	0.18	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	0.453 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	1.06 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus <sup>(1)</sup>	0.17 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.065 N/mm²
Dynamic shear modulus [1]	0.33 N/mm <sup>2</sup>	DIN 53513 <sup>(2)</sup>	preload 0.065 N/mm², 10 Hz
Resistance to strain	0.073 N/mm²		at 10% deformation
Residual compression set	< 5 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 0.70 N/mm <sup>2</sup>	DIN 53455-6-4	minimum
Elongation at break	> 400 %	DIN 53455-6-4	minimum
Tear resistance	> 1.3 N/mm	DIN ISO 34-1/A	
Rebound elasticity	50 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.07 W/[m·K]	DIN 52612-1	
Operating temperature	-30 to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

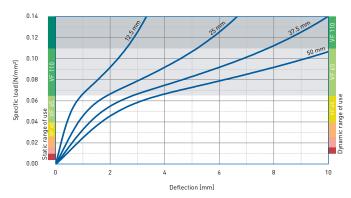
<sup>[1]</sup> measured at maximum limit of static application range



<sup>&</sup>lt;sup>(2)</sup> test according to DIN 53513

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

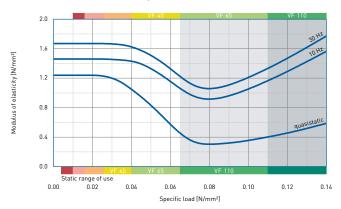
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

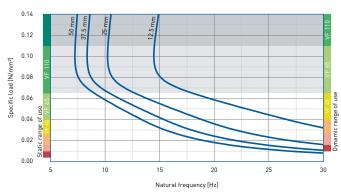
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of  $\pm$  0.22 mm at 10 Hz and  $\pm$  0.08 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

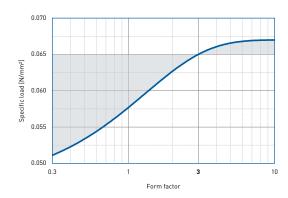
# Natural frequency based on the Modulus of elasticity @ 10Hz



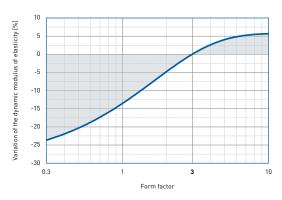
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKAFOAM VF 65 on a stiff subgrade.

Form factor q = 3

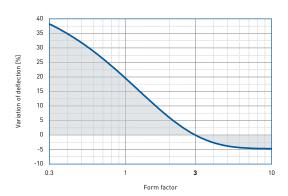
## Static load range

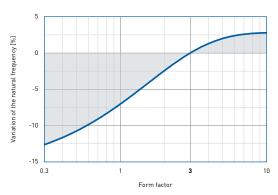


# Dynamic modulus of elasticity @ 10Hz



#### **Deflection**

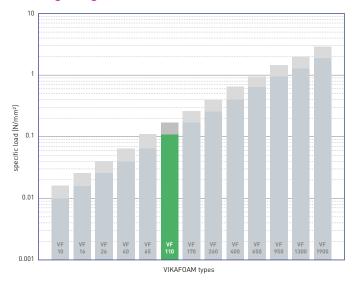




Correction values varying form factors specific load  $0.065 \text{ N/mm}^2$ . Form factor q = 3



## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

0.110

Dynamic load: up to [N/mm<sup>2</sup>]

0.170

Load peaks: up to [N/mm²]

3.0

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material mixed cellular polyether-urethane

Colour green

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions 2.000 x 500 mm

Other dimensions on request (also stamping and moulded parts).

Properties	Value	Test method	Comment
Mechanical loss factor <sup>(1)</sup>	0.12	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	0.861 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	1.86 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus [1]	0.21 N/mm <sup>2</sup>	DIN 53513 <sup>(2)</sup>	preload 0.11 N/mm²
Dynamic shear modulus [1]	0.49 N/mm <sup>2</sup>	DIN 53513 <sup>(2)</sup>	preload 0.11 N/mm², 10 Hz
Resistance to strain	0.130 N/mm <sup>2</sup>		at 10% deformation
Residual compression set	< 5 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 0.95 N/mm <sup>2</sup>	DIN 53455-6-4	minimum
Elongation at break	> 400 %	DIN 53455-6-4	minimum
Tear resistance	> 1.9 N/mm	DIN ISO 34-1/A	
Rebound elasticity	50 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.08 W/[m·K]	DIN 52612-1	
Operating temperature	-30 to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

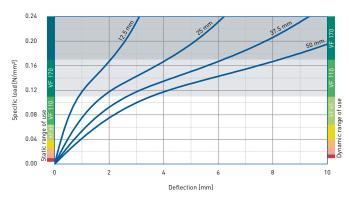
<sup>[1]</sup> measured at maximum limit of static application range

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.



<sup>&</sup>lt;sup>(2)</sup> test according to DIN 53513

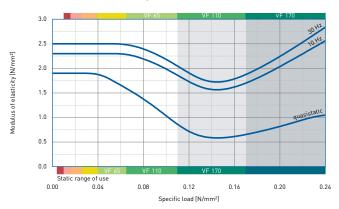
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

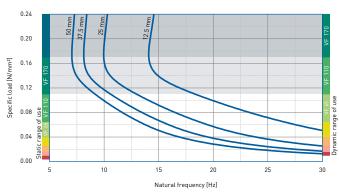
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of ± 0.22 mm at 10 Hz and ± 0.08 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

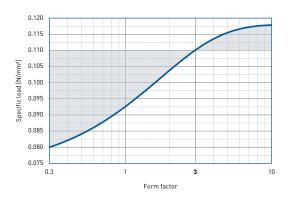
# Natural frequency based on the Modulus of elasticity @ 10Hz



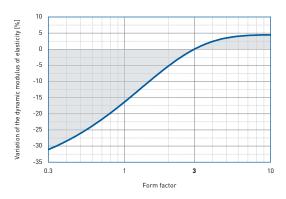
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKAFOAM VF 110 on a stiff subgrade.

Form factor q = 3

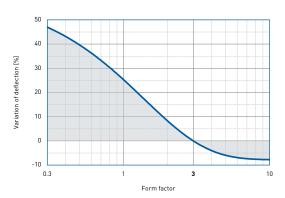
## Static load range

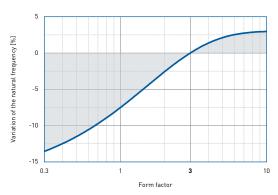


# Dynamic modulus of elasticity @ 10Hz



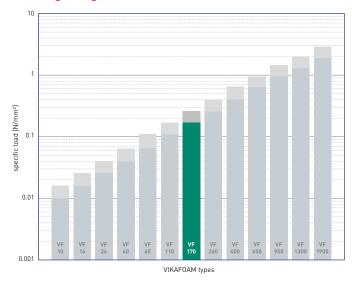
#### **Deflection**





Correction values varying form factors specific load 0.11 N/mm<sup>2</sup>. Form factor q = 3

## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

0.170

Dynamic load: up to [N/mm<sup>2</sup>]

0.260

Load peaks: up to [N/mm²]

3.5

Values depending on form factor and apply to form factor q = 3

 Material mixed cellular polyether-urethane

Colour dark green

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

**Custom Thickness** Combine two or more sheets

Dimensions 2.000 x 500 mm

Other dimensions on request (also stamping and moulded parts).

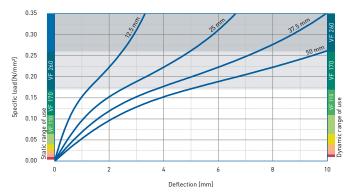
Properties	Value	Test method	Comment
Mechanical loss factor (1)	0.13	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	0.931 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	2.27 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus <sup>(1)</sup>	0.29 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.17 N/mm²
Dynamic shear modulus [1]	0.73 N/mm <sup>2</sup>	DIN 53513 <sup>(2)</sup>	preload 0.17 N/mm², 10 Hz
Resistance to strain	0.170 N/mm²		at 10% deformation
Residual compression set	< 5 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 1.25 N/mm <sup>2</sup>	DIN 53455-6-4	minimum
Elongation at break	> 400 %	DIN 53455-6-4	minimum
Tear resistance	> 2.5 N/mm	DIN ISO 34-1/A	
Rebound elasticity	50 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.08 W/[m·K]	DIN 52612-1	
Operating temperature	-30 up to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

<sup>[1]</sup> measured at maximum limit of static application range

test according to DIN 53513
All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed.



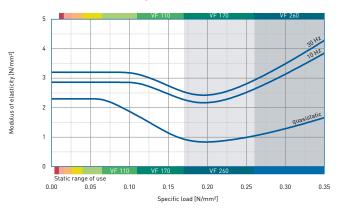
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

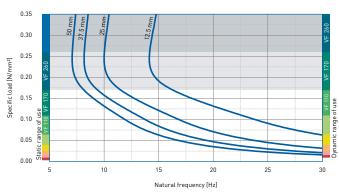
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of  $\pm$  0.22 mm at 10 Hz and  $\pm$  0.08 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

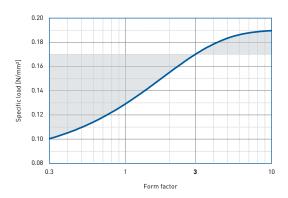
# Natural frequency based on the Modulus of elasticity @ 10Hz



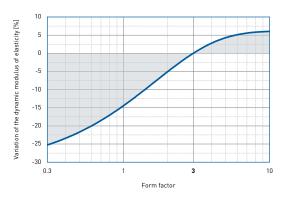
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKAFOAM VF 170 on a stiff subgrade.

Form factor q = 3

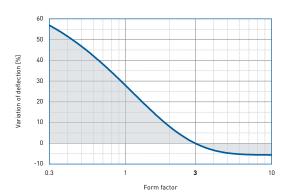
## Static load range

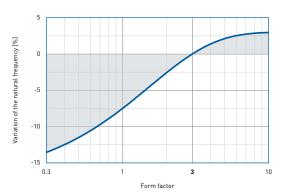


# Dynamic modulus of elasticity @ 10Hz



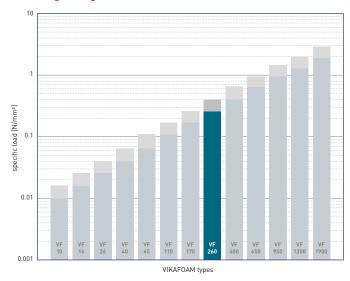
#### **Deflection**





Correction values varying form factors specific load 0.17 N/mm<sup>2</sup>. Form factor q = 3

## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

0.260

Dynamic load: up to [N/mm<sup>2</sup>]

0.400

Load peaks: up to [N/mm²]

4.0

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material mixed cellular polyether-urethane

Colour petrol

# **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions 2.000 x 500 mm

Properties	Value	Test method	Comment
Mechanical loss factor [1]	0.11	DIN 53513 <sup>[2]</sup>	guide value
Static E-modulus (1)	1.64 N/mm²	DIN 53513 <sup>[2]</sup>	
Dynamic E-modulus (1)	3.63 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus [1]	0.41 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.26 N/mm²
Dynamic shear modulus [1]	1.00 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.26 N/mm², 10 Hz
Resistance to strain	0.270 N/mm <sup>2</sup>		at 10% deformation
Residual compression set	< 5 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 1.65 N/mm²	DIN 53455-6-4	minimum
Elongation at break	> 400 %	DIN 53455-6-4	minimum
Tear resistance	> 2.9 N/mm	DIN ISO 34-1/A	
Rebound elasticity	45 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.08 W/[m·K]	DIN 52612-1	
Operating temperature	-30 to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

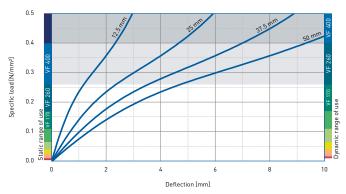
<sup>[1]</sup> measured at maximum limit of static application range



<sup>&</sup>lt;sup>(2)</sup> test according to DIN 53513

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

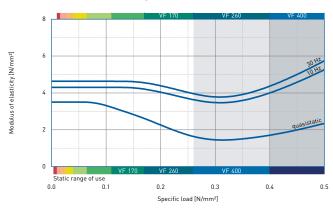
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

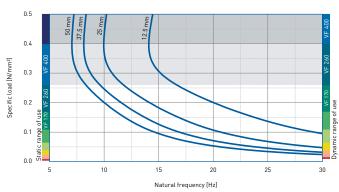
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of ± 0.22 mm at 10 Hz and ± 0.08 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

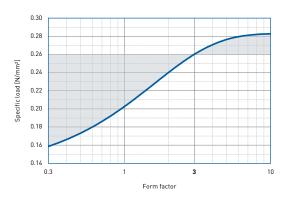
# Natural frequency based on the Modulus of elasticity @ 10Hz



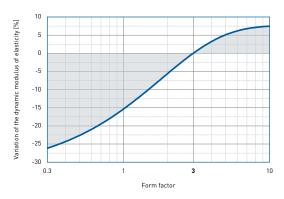
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKAFOAM VF 260 on a stiff subgrade.

Form factor q = 3

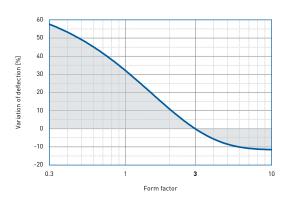
## Static load range

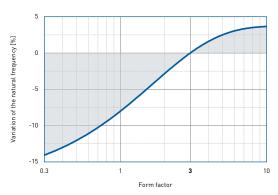


# Dynamic modulus of elasticity @ 10Hz



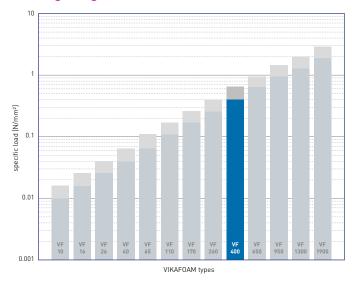
#### **Deflection**





Correction values varying form factors specific load 0.26 N/mm<sup>2</sup>. Form factor q = 3

## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

0.400

Dynamic load: up to [N/mm<sup>2</sup>]

0.650

Load peaks: up to [N/mm²]

4.5

Values depending on form factor and apply to form factor q = 3

 Material mixed cellular polyether-urethane

Colour

# **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

**Custom Thickness** Combine two or more sheets

Dimensions 2.000 x 500 mm

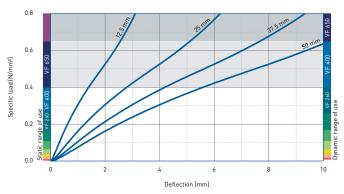
Properties	Value	Test method	Comment
Mechanical loss factor (1)	0.10	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	2.72 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	5.27 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus [1]	0.53 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.40 N/mm²
Dynamic shear modulus [1]	1.15 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.40 N/mm², 10 Hz
Resistance to strain	0.370 N/mm²		at 10% deformation
Residual compression set	< 5 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 2.25 N/mm²	DIN 53455-6-4	minimum
Elongation at break	> 400 %	DIN 53455-6-4	minimum
Tear resistance	> 3.2 N/mm	DIN ISO 34-1/A	
Rebound elasticity	45 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.10 W/[m·K]	DIN 52612-1	
Operating temperature	-30 to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

<sup>[1]</sup> measured at maximum limit of static application range



<sup>&</sup>lt;sup>12</sup> test according to DIN 53513
All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

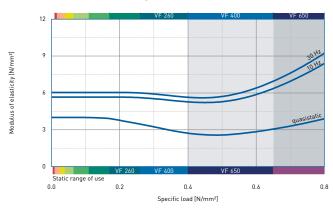
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

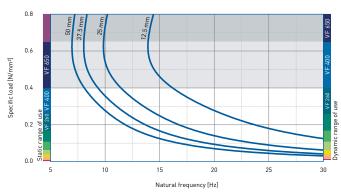
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of ± 0.22 mm at 10 Hz and ± 0.08 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

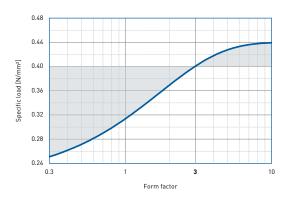
# Natural frequency based on the Modulus of elasticity @ 10Hz



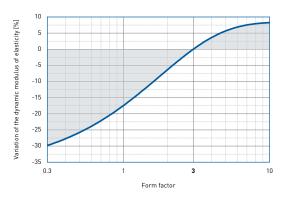
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKAFOAM VF 400 on a stiff subgrade.

Form factor q = 3

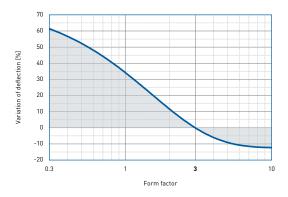
## Static load range

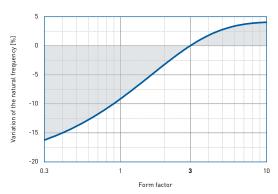


# Dynamic modulus of elasticity @ 10Hz



#### **Deflection**

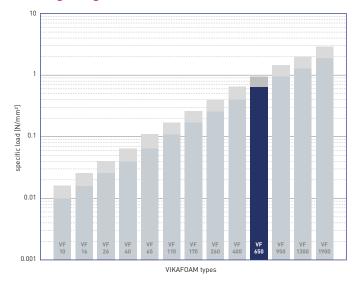




Correction values varying form factors specific load  $0.4 \text{ N/mm}^2$ . Form factor q = 3



## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm²]

0.650

Dynamic load: up to [N/mm<sup>2</sup>]

0.950

Load peaks: up to [N/mm²]

5.5

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material mixed cellular polyether-urethane

• Colour dark blue

# **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions
 2.000 x 500 mm

Properties	Value	Test method	Comment
Mechanical loss factor (1)	0.10	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	4.57 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	10.4 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus <sup>(1)</sup>	0.68 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.65 N/mm²
Dynamic shear modulus [1]	1.85 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.65 N/mm², 10 Hz
Resistance to strain	0.590 N/mm²		at 10% deformation
Residual compression set	< 5 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 3.00 N/mm <sup>2</sup>	DIN 53455-6-4	minimum
Elongation at break	> 400 %	DIN 53455-6-4	minimum
Tear resistance	> 3.8 N/mm	DIN ISO 34-1/A	
Rebound elasticity	45 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.10 W/[m·K]	DIN 52612-1	
Operating temperature	-30 to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

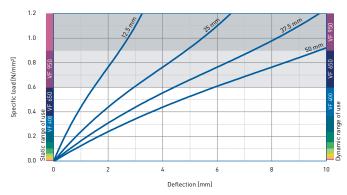
<sup>[1]</sup> measured at maximum limit of static application range



<sup>&</sup>lt;sup>(2)</sup> test according to DIN 53513

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

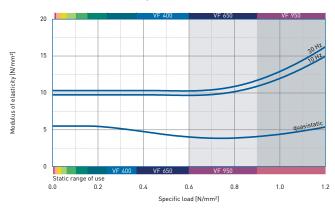
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

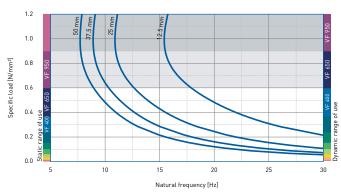
Form factor q = 2

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of ± 0.22 mm at 10 Hz and ± 0.08 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 2

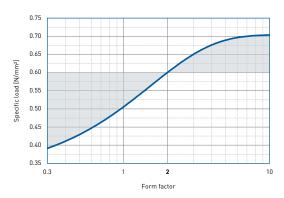
# Natural frequency based on the Modulus of elasticity @ 10Hz



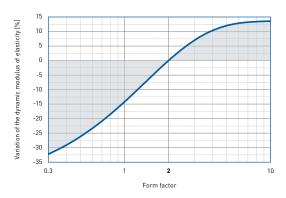
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKAFOAM VF 650 on a stiff subgrade.

Form factor q = 2

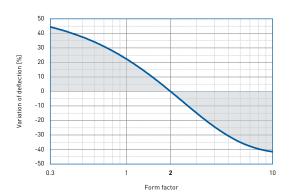
# Static load range

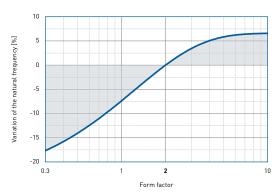


# Dynamic modulus of elasticity @ 10Hz



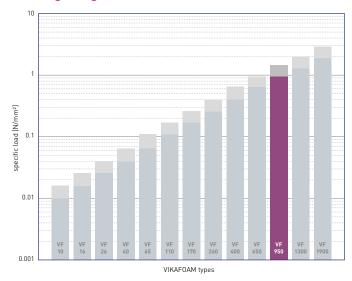
#### **Deflection**





Correction values varying form factors specific load 0.6 N/mm<sup>2</sup>. Form factor q = 2

## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

0.950

Dynamic load: up to [N/mm<sup>2</sup>]

1.450

Load peaks: up to [N/mm²]

6.0

Values depending on form factor and apply to form factor q = 3

 Material mixed cellular polyether-urethane

Colour dark violet

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

**Custom Thickness** Combine two or more sheets

Dimensions 2.000 x 500 mm

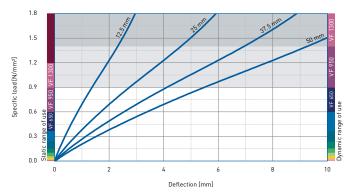
Properties	Value	Test method	Comment
Mechanical loss factor (1)	0.10	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	8.16 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	21.5 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus (1)	0.93 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.95 N/mm²
Dynamic shear modulus [1]	2.84 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.95 N/mm², 10 Hz
Resistance to strain	0.930 N/mm²		at 10% deformation
Residual compression set	< 9 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 3.80 N/mm <sup>2</sup>	DIN 53455-6-4	minimum
Elongation at break	> 400 %	DIN 53455-6-4	minimum
Tear resistance	> 5.2 N/mm	DIN ISO 34-1/A	
Rebound elasticity	45 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.11 W/[m·K]	DIN 52612-1	
Operating temperature	-30 to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

<sup>[1]</sup> measured at maximum limit of static application range



<sup>&</sup>lt;sup>22</sup> test according to DIN 53513
All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

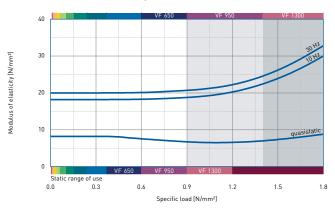
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

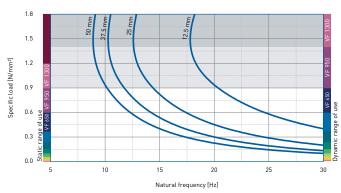
Form factor q = 2

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of  $\pm$  0.22 mm at 10 Hz and  $\pm$  0.08 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 2

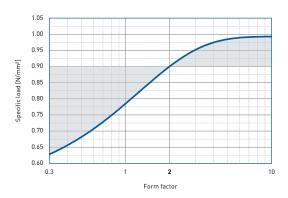
# Natural frequency based on the Modulus of elasticity @ 10Hz



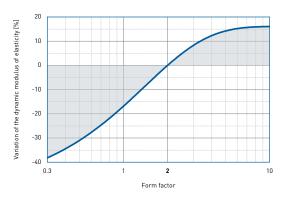
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKAFOAM VF 950 on a stiff subgrade.

Form factor q = 2

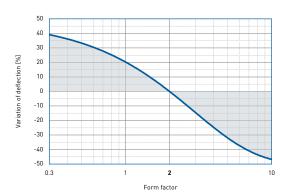
## Static load range

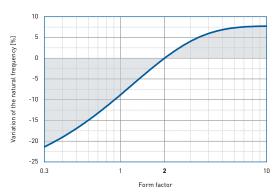


# Dynamic modulus of elasticity @ 10Hz



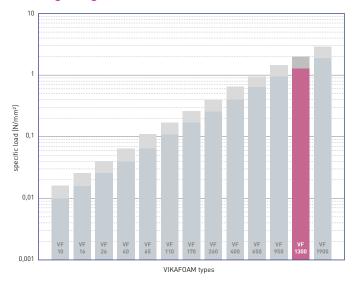
#### **Deflection**





Correction values varying form factors specific load 0.9 N/mm<sup>2</sup>. Form factor q = 2

## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

1.300

Dynamic load: up to [N/mm<sup>2</sup>]

2.000

Load peaks: up to [N/mm²]

6.5

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material mixed cellular polyether-urethane

Colour violet

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions 2.000 x 500 mm

Other dimensions on request (also stamping and moulded parts).

Properties	Value	Test method	Comment
Mechanical loss factor [1]	0.09	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus [1]	12.0 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	35.2 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus (1)	1.23 N/mm <sup>2</sup>	DIN 53513 <sup>(2)</sup>	preload 1.30 N/mm²
Dynamic shear modulus [1]	3.51 N/mm²	DIN 53513 <sup>(2)</sup>	preload 1.30 N/mm², 10 Hz
Resistance to strain	1.340 N/mm²		at 10% deformation
Residual compression set	< 9 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 4.40 N/mm <sup>2</sup>	DIN 53455-6-4	minimum
Elongation at break	> 400 %	DIN 53455-6-4	minimum
Tear resistance	> 5.4 N/mm	DIN ISO 34-1/A	
Rebound elasticity	40 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.11 W/[m·K]	DIN 52612-1	
Operating temperature	-30 to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

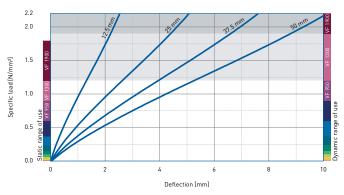
<sup>[1]</sup> measured at maximum limit of static application range

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.



<sup>&</sup>lt;sup>(2)</sup> test according to DIN 53513

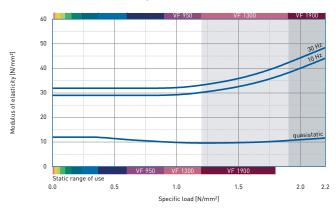
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

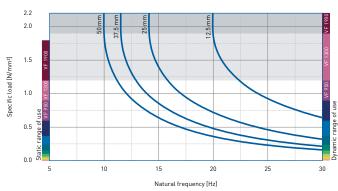
Form factor q = 2

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of ± 0.22 mm at 10 Hz and ± 0.08 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 2

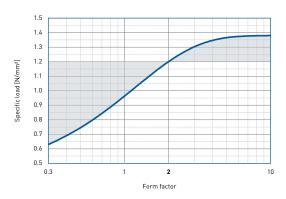
# Natural frequency based on the Modulus of elasticity @ 10Hz



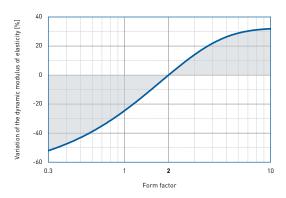
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKAFOAM VF 1300 on a stiff subgrade.

Form factor q = 2

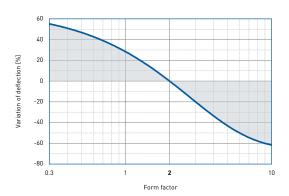
## Static load range

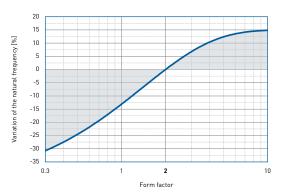


# Dynamic modulus of elasticity @ 10Hz



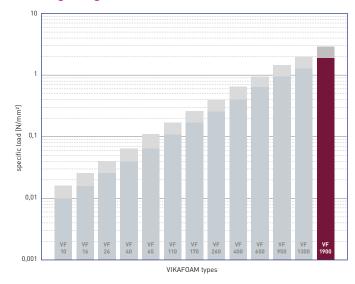
#### **Deflection**





Correction values varying form factors specific load 1.2 N/mm<sup>2</sup>. Form factor q = 2

## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

1.900

Dynamic load: up to [N/mm<sup>2</sup>]

2.800

Load peaks: up to [N/mm²]

7.0

Values depending on form factor and apply to form factor q = 3

 Material mixed cellular polyether-urethane

Colour bordeaux red

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

**Custom Thickness** Combine two or more sheets

Dimensions 2.000 x 500 mm

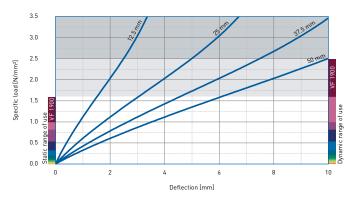
Other dimensions on request (also stamping and moulded parts).

Properties	Value	Test method	Comment
Mechanical loss factor (1)	0.09	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	20.4 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	78.2 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus <sup>(1)</sup>	1.75 N/mm²	DIN 53513 <sup>(2)</sup>	preload 1.90 N/mm²
Dynamic shear modulus [1]	6.00 N/mm <sup>2</sup>	DIN 53513 <sup>(2)</sup>	preload 1.90 N/mm², 10 Hz
Resistance to strain	1.840 N/mm²		at 10% deformation
Residual compression set	< 8 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 5.00 N/mm <sup>2</sup>	DIN 53455-6-4	minimum
Elongation at break	> 400 %	DIN 53455-6-4	minimum
Tear resistance	> 6.0 N/mm	DIN ISO 34-1/A	
Rebound elasticity	40 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.11 W/[m·K]	DIN 52612-1	
Operating temperature	-30 to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

(1) measured at maximum limit of static application range (12) test according to DIN 53513
All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.



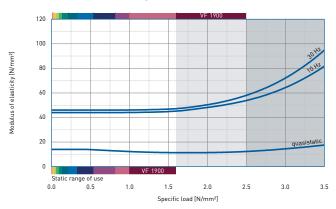
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

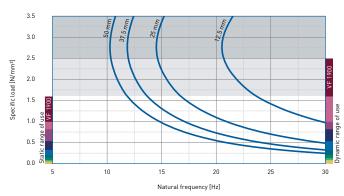
Form factor q = 1.25

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of  $\pm$  0.22 mm at 10 Hz and  $\pm$  0.08 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 1.25

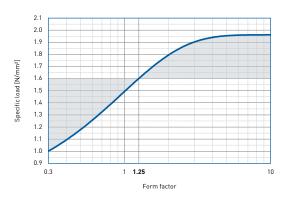
# Natural frequency based on the Modulus of elasticity **@** 10Hz



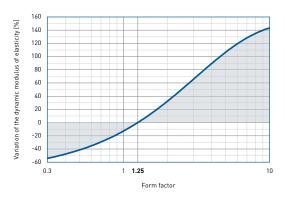
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKAFOAM VF 1900 on a stiff subgrade.

Form factor q = 1.25

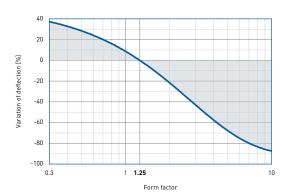
## Static load range

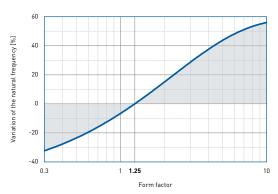


# Dynamic modulus of elasticity @ 10Hz



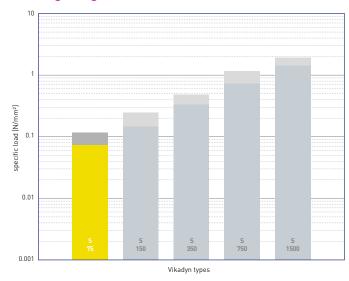
#### **Deflection**





Correction values varying form factors specific load 1.6 N/mm<sup>2</sup>. Form factor q = 1.25

## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm²]

0.075

Dynamic load: up to [N/mm²]

0.120

Load peaks: up to [N/mm²]

2.0

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material closed cellular polyether-urethane

Colour yellow

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions 2.000 x 500 mm

Properties	Value	Test method	Comment
Mechanical loss factor [1]	0.06	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	0.63 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	0.92 N/mm²	DIN 53513 (2)	
Static shear modulus [1]	0.16 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.075 N/mm²
Dynamic shear modulus (1)	0.27 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.075 N/mm², 10 Hz
Resistance to strain	0.083 N/mm²		at 10% deformation
Residual compression set	< 5 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 1.5 N/mm²	DIN 53455-6-4	minimum
Elongation at break	> 500 %	DIN 53455-6-4	minimum
Tear resistance	> 1.6 N/mm	DIN ISO 34-1/A	
Rebound elasticity	70 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.06 W/[m·K]	DIN 52612-1	
Operating temperature	-30 up to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

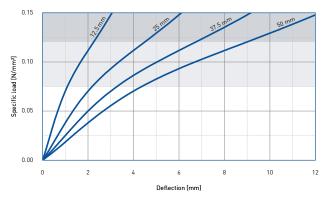
<sup>[1]</sup> measured at maximum limit of static application range



<sup>(2)</sup> test according to DIN 53513

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

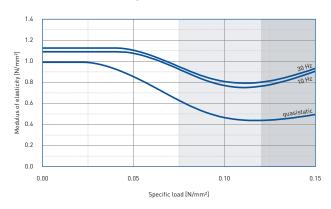
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

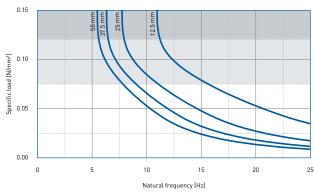
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of  $\pm$  0.11 mm at 10 Hz and  $\pm$  0.04 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

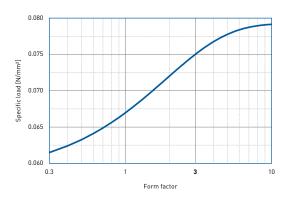
# Natural frequency based on the Modulus of elasticity @ 10Hz



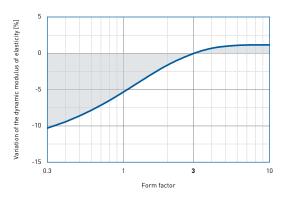
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKADYN VD 150 on a stiff subgrade.

Form factor q = 3

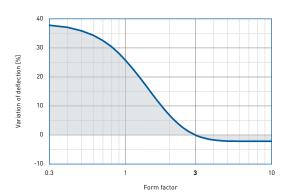
# Static load range



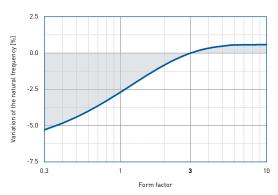
# Dynamic modulus of elasticity @ 10Hz



#### **Deflection**

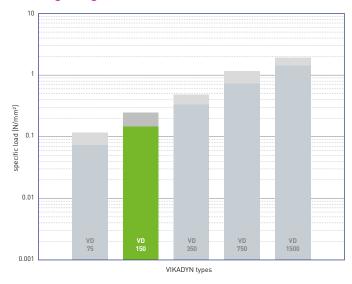


#### Natural frequency



Correction values varying form factors specific load 0.15 N/mm<sup>2</sup>. Form factor q = 3

## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

0.150

Dynamic load: up to [N/mm<sup>2</sup>]

0.250

Load peaks: up to [N/mm²]

3.0

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material closed cellular polyether-urethane

Colour green

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions 2.000 x 500 mm

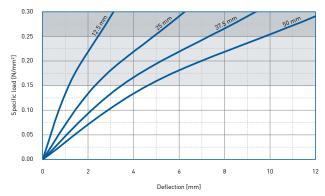
Properties	Value	Test method	Comment
Mechanical loss factor [1]	0.03	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	1.25 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	1.65 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus [1]	0.22 N/mm <sup>2</sup>	DIN 53513 <sup>(2)</sup>	preload 0.15 N/mm²
Dynamic shear modulus [1]	0.35 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.15 N/mm², 10 Hz
Resistance to strain	0.16 N/mm²		at 10% deformation
Residual compression set	< 5 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 2.0 N/mm²	DIN 53455-6-4	minimum
Elongation at break	> 500 %	DIN 53455-6-4	minimum
Tear resistance	> 2.1 N/mm	DIN ISO 34-1/A	
Rebound elasticity	70 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.075 W/[m·K]	DIN 52612-1	
Operating temperature	-30 up to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

<sup>[1]</sup> measured at maximum limit of static application range

<sup>(2)</sup> test according to DIN 53513

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

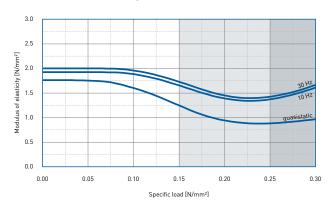
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

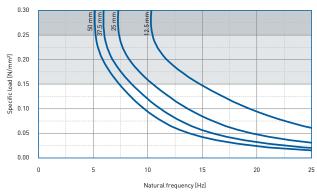
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of  $\pm$  0.11 mm at 10 Hz and  $\pm$  0.04 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

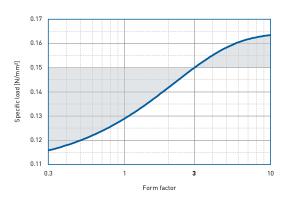
# Natural frequency based on the Modulus of elasticity @ 10Hz



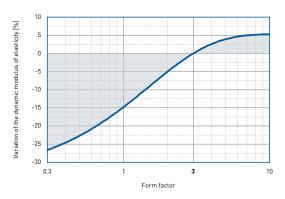
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKADYN VD 150 on a stiff subgrade.

Form factor q = 3

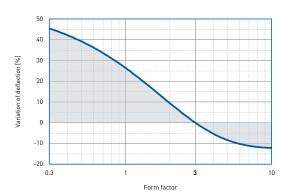
## Static load range

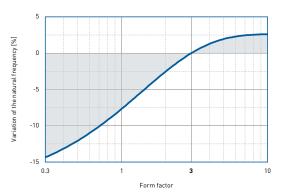


# Dynamic modulus of elasticity @ 10Hz



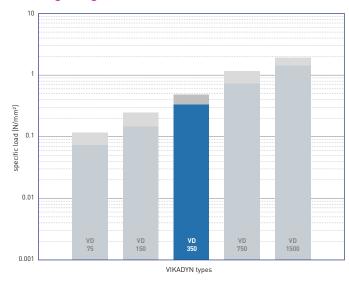
#### **Deflection**





Correction values varying form factors specific load 0.15 N/mm<sup>2</sup>. Form factor q = 3

## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

0.350

Dynamic load: up to [N/mm<sup>2</sup>]

0.500

Load peaks: up to [N/mm²]

4.0

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material closed cellular polyether-urethane

Colour blue

# **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions 2.000 x 500 mm

Properties	Value	Test method	Comment
Mechanical loss factor (1)	0.03	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	2.53 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	3.25 N/mm <sup>2</sup>	DIN 53513 <sup>(2)</sup>	
Static shear modulus (1)	0,35 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.35 N/mm²
Dynamic shear modulus [1]	0,52 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.35 N/mm², 10 Hz
Resistance to strain	0.32 N/mm²		at 10% deformation
Residual compression set	< 5 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 3.5 N/mm²	DIN 53455-6-4	minimum
Elongation at break	> 500 %	DIN 53455-6-4	minimum
Tear resistance	> 2.5 N/mm	DIN ISO 34-1/A	
Rebound elasticity	70 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.09 W/[m·K]	DIN 52612-1	
Operating temperature	-30 up to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

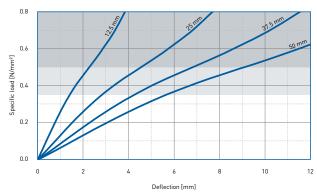
<sup>[1]</sup> measured at maximum limit of static application range



<sup>&</sup>lt;sup>(2)</sup> test according to DIN 53513

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

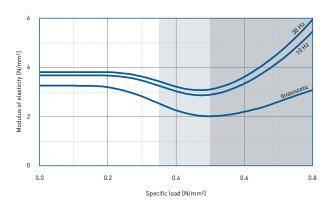
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

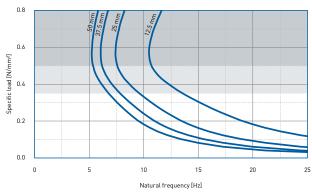
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of  $\pm$  0.11 mm at 10 Hz and  $\pm$  0.04 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

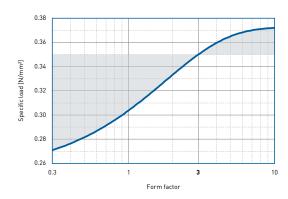
# Natural frequency based on the Modulus of elasticity @ 10Hz



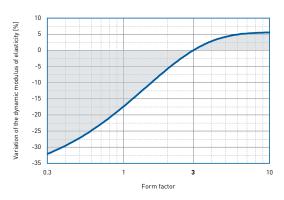
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKADYN VD 350 on a stiff subgrade.

Form factor q = 3

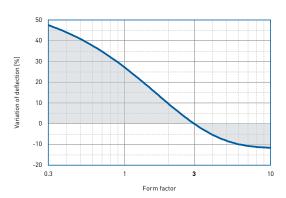
## Static load range

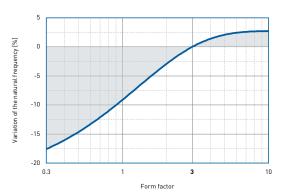


# Dynamic modulus of elasticity @ 10Hz



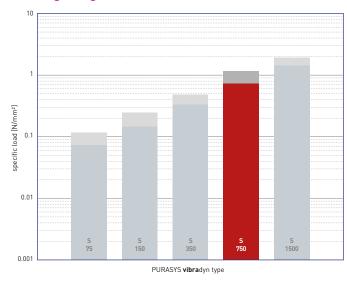
#### **Deflection**





Correction values varying form factors specific load  $0.35 \text{ N/mm}^2$ . Form factor q = 3

## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm²]

0.750

Dynamic load: up to [N/mm<sup>2</sup>]

1.200

Load peaks: up to [N/mm²]

6.0

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material closed cellular polyether-urethane

Colour red

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions 2.000 x 500 mm

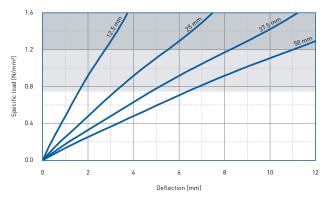
Properties	Value	Test method	Comment
Mechanical loss factor [1]	0.04	DIN 53513 <sup>(2)</sup>	guide value
Static E-modulus (1)	5.21 N/mm²	DIN 53513 <sup>(2)</sup>	
Dynamic E-modulus (1)	8.88 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus [1]	0.80 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.75 N/mm²
Dynamic shear modulus [1]	1.22 N/mm²	DIN 53513 <sup>(2)</sup>	preload 0.75 N/mm², 10 Hz
Resistance to strain	0.59 N/mm²		at 10% deformation
Residual compression set	< 6 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 5.0 N/mm²	DIN 53455-6-4	minimum
Elongation at break	> 500 %	DIN 53455-6-4	minimum
Tear resistance	> 4.3 N/mm	DIN ISO 34-1/A	
Rebound elasticity	70 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.10 W/[m·K]	DIN 52612-1	
Operating temperature	-30 up to +70 °C		
Temperature peak	+120 °C	_	
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

<sup>[1]</sup> measured at maximum limit of static application range

<sup>(2)</sup> test according to DIN 53513

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

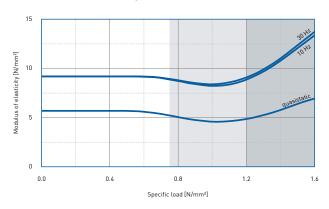
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

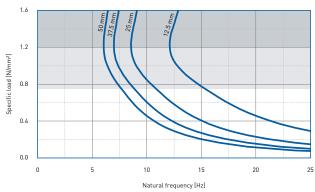
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of  $\pm$  0.11 mm at 10 Hz and  $\pm$  0.04 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

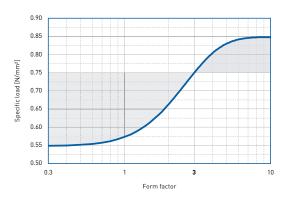
# Natural frequency based on the Modulus of elasticity @ 10Hz



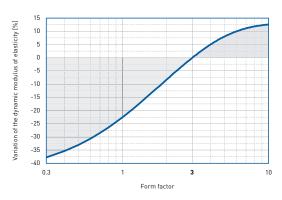
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKADYN VD 350 on a stiff subgrade.

Form factor q = 3

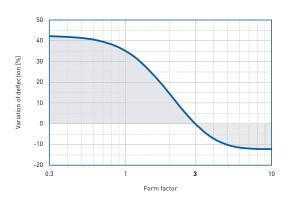
## Static load range

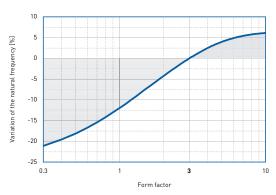


# Dynamic modulus of elasticity @ 10Hz



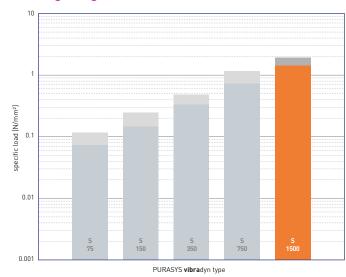
#### **Deflection**





Correction values varying form factors specific load 0.35 N/mm<sup>2</sup>. Form factor q = 3

## Working range





## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

1.500

Dynamic load: up to [N/mm²]

2.000

Load peaks: up to [N/mm²]

8.0

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material closed cellular polyether-urethane

• Colour orange

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness Combine two or more sheets

Dimensions 2.000 x 500 mm

Properties	Value	Test method	Comment
Mechanical loss factor [1]	0.05	DIN 53513 <sup>[2]</sup>	guide value
Static E-modulus (1)	9.21 N/mm²	DIN 53513 <sup>[2]</sup>	
Dynamic E-modulus [1]	16.66 N/mm²	DIN 53513 <sup>(2)</sup>	
Static shear modulus [1]	1.15 N/mm²	DIN 53513 <sup>(2)</sup>	preload 1.5 N/mm²
Dynamic shear modulus [1]	1.69 N/mm²	DIN 53513 <sup>(2)</sup>	preload 1.5 N/mm², 10 Hz
Resistance to strain	0.94 N/mm²		at 10% deformation
Residual compression set	< 8 %	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading
Tensile strength	> 7.0 N/mm²	DIN 53455-6-4	minimum
Elongation at break	> 500 %	DIN 53455-6-4	minimum
Tear resistance	> 5.6 N/mm	DIN ISO 34-1/A	
Rebound elasticity	70 %	DIN EN ISO 8307	± 10%
Specific volume resistance	>10 <sup>11</sup> Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.11 W/[m·K]	DIN 52612-1	
Operating temperature	-30 up to +70 °C		
Temperature peak	+120 °C		
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable

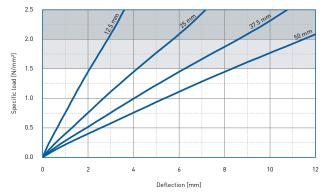
<sup>[1]</sup> measured at maximum limit of static application range



<sup>(2)</sup> test according to DIN 53513

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

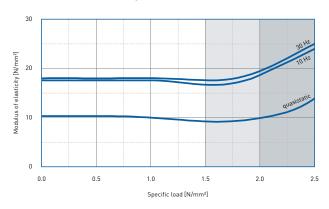
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

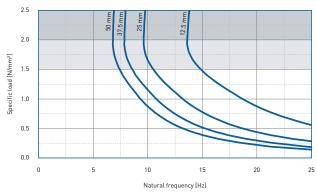
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of  $\pm$  0.11 mm at 10 Hz and  $\pm$  0.04 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

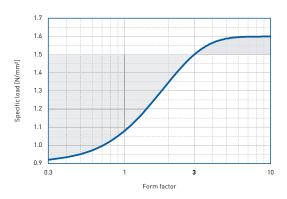
# Natural frequency based on the Modulus of elasticity ${\bf @ 10 Hz}$



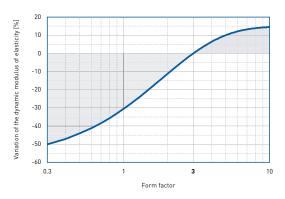
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKADYN VD 350 on a stiff subgrade.

Form factor q = 3

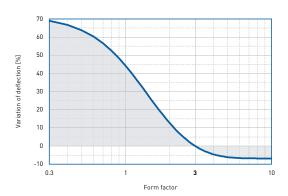
## Static load range



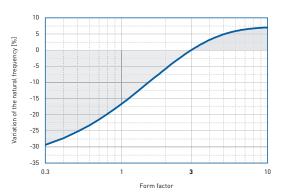
## Dynamic modulus of elasticity @ 10Hz



#### **Deflection**



## Natural frequency



Correction values varying form factors specific load  $0.35 \text{ N/mm}^2$ . Form factor q = 3

## Working range



## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

3.00

Dynamic load: up to [N/mm<sup>2</sup>]

4.50

Load peaks: up to [N/mm²]

10.5

Values depending on form factor and apply to form factor  ${\bf q}={\bf 3}$ 

• Material closed cellular polyether-urethane

• Colour blue

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness
 Combine two or more sheets

Dimensions 2.000 x 500 mm

Other dimensions on request (also stamping and moulded parts).

Properties	Value	Test method	Comment	
Mechanical loss factor [1]	0.09	DIN 53513 <sup>(2)</sup>	guide value	
Static E-modulus (1)	17 N/mm²	DIN 53513 <sup>(2)</sup>		
Dynamic E-modulus (1)	43 N/mm²	DIN 53513 <sup>(2)</sup>		
Static shear modulus [1]	1.93 N/mm²	DIN 53513 <sup>(2)</sup>	preload 3.0 N/mm²	
Dynamic shear modulus (1)	4.0 N/mm²	DIN 53513 <sup>(2)</sup>	preload 3.0 N/mm², 10 Hz	
Resistance to strain	2.3 N/mm²		at 10% deformation	
Residual compression set	< 5%	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading	
Operating temperature	-30 to +70 °C			
Temperature peak	+120 °C			
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable	

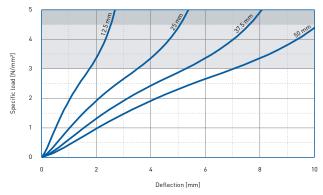
<sup>[1]</sup> measured at maximum limit of static application range



<sup>(2)</sup> test according to DIN 53513

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

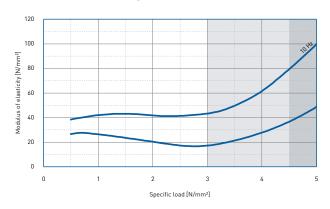
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

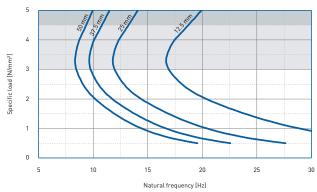
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of ± 0.11 mm at 10 Hz and ± 0.04 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

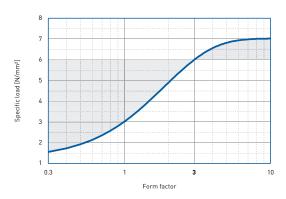
# Natural frequency based on the Modulus of elasticity @ 10Hz



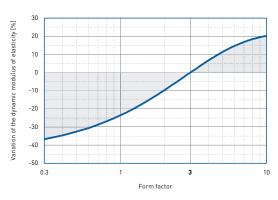
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKADYN VD 350 on a stiff subgrade.

Form factor q = 3

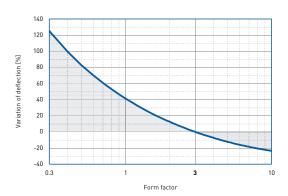
## Static load range



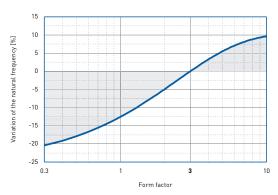
## Dynamic modulus of elasticity @ 10Hz



#### **Deflection**



## Natural frequency



Correction values varying form factors specific load  $0.35 \text{ N/mm}^2$ . Form factor q = 3

## Working range



## Recommendations for elastic bearing

Static load: up to [N/mm<sup>2</sup>]

6.00

Dynamic load: up to [N/mm²]

9.00

Load peaks: up to [N/mm²]

18.0

Values depending on form factor and apply to form factor  $\mathbf{q} = 3$ 

• Material closed cellular polyether-urethane

Colour black grey

## **Sheet specifications**

Standard Thickness 12.5 mm and 25 mm

Custom Thickness
 Combine two or more sheets

Dimensions
 2.000 x 500 mm

Other dimensions on request (also stamping and moulded parts).

Properties	Value	Test method	Comment	
Mechanical loss factor [1]	0.11	DIN 53513 <sup>(2)</sup>	guide value	
Static E-modulus (1)	55 N/mm²	DIN 53513 <sup>(2)</sup>		
Dynamic E-modulus (1)	135 N/mm²	DIN 53513 <sup>(2)</sup>		
Static shear modulus [1]	3.5 N/mm²	DIN 53513 <sup>(2)</sup>	preload 6.0 N/mm²	
Dynamic shear modulus (1)	6.0 N/mm²	DIN 53513 <sup>(2)</sup>	preload 6.0 N/mm², 10 Hz	
Resistance to strain	4.2 N/mm²		at 10% deformation	
Residual compression set	< 5%	DIN EN ISO 1856	50%, 23°C, 70 h, 30 min after unloading	
Operating temperature	-30 to +70 °C			
Temperature peak	+120 °C			
Inflammability	Class E / EN 13501-1	EN ISO 11925-1	normal flammable	

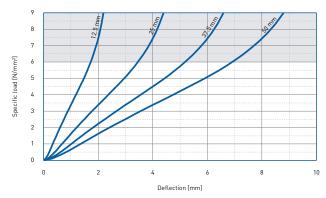
<sup>[1]</sup> measured at maximum limit of static application range



<sup>(2)</sup> test according to DIN 53513

All information and data is based on our current knowledge. The data are subject to typical manufacturing tolerances and are not guaranteed. We reserve the right to amend the data.

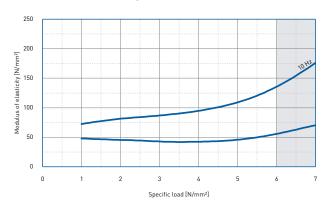
#### Load deflection curve



Recording of the 3rd loading; testing between steel plates at room temperature measured with a deflection rate of 1% of the thickness per second.

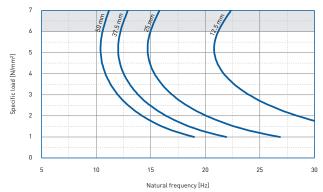
Form factor q = 3

## Modulus of elasticity



- Dynamic test: sinusoidal excitation with an oscillating range of  $\pm$  0.11 mm at 10 Hz and  $\pm$  0.04 mm at 30 Hz.
- Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve.
- Test according to DIN 53513. Form factor q = 3

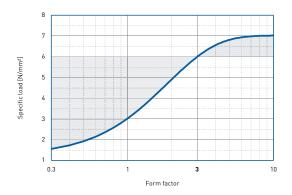
# Natural frequency based on the Modulus of elasticity @ 10Hz



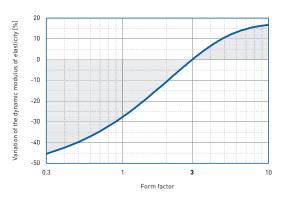
Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of VIKADYN VD 350 on a stiff subgrade.

Form factor q = 3

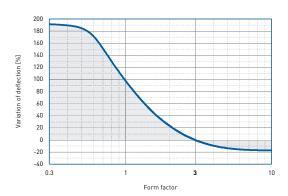
## Static load range



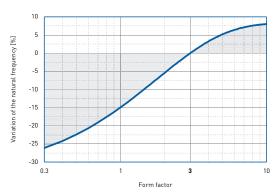
## Dynamic modulus of elasticity @ 10Hz



#### **Deflection**



## Natural frequency



Correction values varying form factors specific load  $0.35 \text{ N/mm}^2$ . Form factor q = 3

## **VIKAFOAM / VIKACELL**

## Referenceliste for flydende gulve

## Amager Bakke Denmark

• Waste-to-Heat Plant, Floating floor, 3.650 m<sup>2</sup> with VIKACELL

#### Sillebroen Denmark

• Cinema, room-in-room, four theaters on VIKACELL

#### University of Southern Denmark Denmark

• Floating floor, around electron microscope on VIKACELL

#### **CINEMAXX** Denmark

• Cinema, one theater, on VIKAFOAM

#### **Grundfos** Denmark

• Floating floor, carpet type, on 75 mm thick VIKAFOAM

#### Sony Ericsson Sweden

• Anechoic chamber, on VIKAFOAM

#### Danish Technical University Denmark

• Audiology room, on VIKAFOAM

#### Sennheiser Communications Denmark

• Three sound quality rooms, on VIKAFOAM

#### **Østfold Sykehus** Norway

• Audiometry room, on VIKAFOAM

## Danish Technical University Denmark

• Five test boxes, on VIKAFOAM

## Dammam University Saudi Arabia

Anechoic and reverberation chamber, on VIKAFOAM

## Sydvest Sygehus Denmark

• Audiometry room, on VIKAFOAM

#### **Akershus University Hospital Norway**

• Four audiometry rooms, on VIKAFOAM

# Flight Medical Centre (Copenhagen University Hospital) Denmark

• Audiometry room, clinical testing, on VIKAFOAM

#### Helsingborg Hospital Sweden

• Three audiometry rooms, on VIKAFOAM

# Aalborg Centre for Deaf-Blindness and Hearing Loss Denmark

QAudiometry room, Cochlear implants, on VIKAFOAM

#### **Herning Private Clinic Denmark**

• Two audiometry rooms, on VIKAFOAM

#### Ryhov Hospital Sweden

• Audiometry room, on VIKAFOAM

#### Nässjö Hospital Sweden

• Audiometry room, on VIKAFOAM

## Norwegian University of Science and Technology Norway

• Two voice-over-booths, Psychological research ,on VIKAFOAM

#### **Lund University Hospital Sweden**

 Anechoic chamber and audiometry chamber for clinical testing and research, on VIKAFOAM

## Statped (Trondheim) Norway

• Voice-over-booth, on VIKAFOAM

## **Danish Technical University Denmark**

 Three audiometry chambers, Centre for Applied Hearing Research, on VIKAFOAM

#### **Danmarks Radio** Denmark

• Three news sports studios, on VIKAFOAM

#### **DELTA** Denmark

- Hørsholm: EBU, reference class listening chamber, on VIKAFOAM
- Odense (new facility): Three anechoic chambers, hearing aid certification measurements, on VIKAFOAM
- Odense University: Anechoic chamber, hearing aid certification measurements, on VIKAFOAM

#### **GN ReSound** Denmark

• Three audiometry chambers, audiology research, on VIKAFOAM

#### **Nokia** Denmark

• Anechoic chamber, two Listeningchambers, on VIKAFOAM

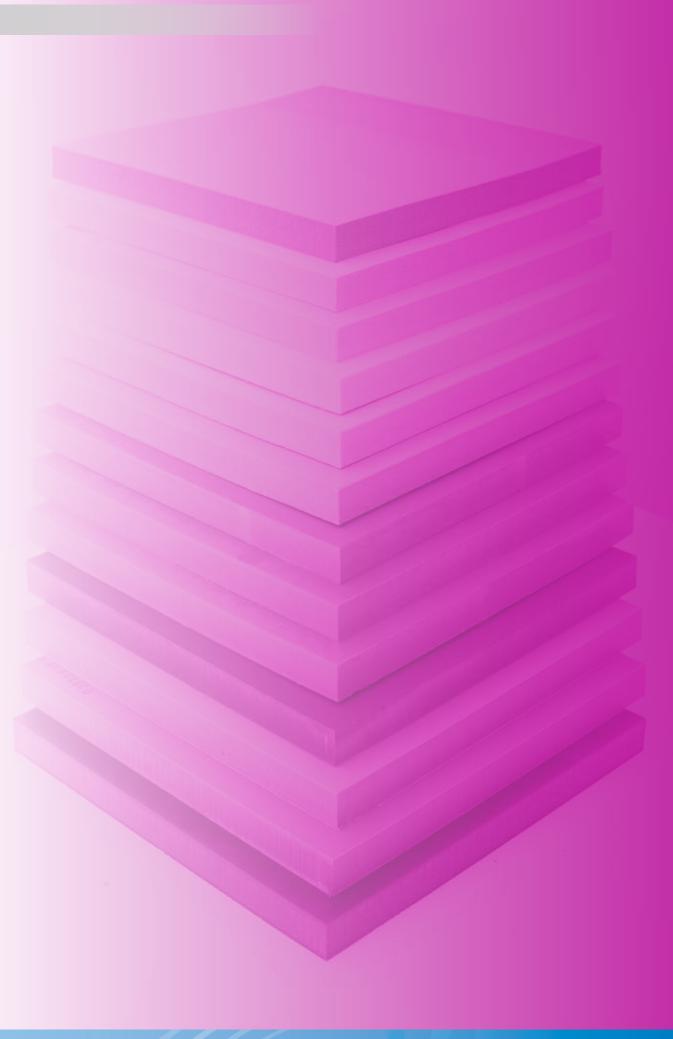
#### Oticon Denmark

- Copenhagen: Nine anechoic chambers, on VIKAFOAM
- Copenhagen: Three audiometry chambers, on VIKAFOAM
- Eriksholm: Double wall anechoic chamber on VIKAFOAM
- Espergærde: Mini sound shelter, research, on VIKAFOAM

## Aalborg University Denmark

• Anechoic chamber, two listening chambers, on VIKAFOAM





## **Contents**

## Sound absorbers



IKALON 135 ALU/MK



**IKALON MF-MK** 



IKALON PROFILE/MK



Pages 190 – 197

LA SE



IKALON 135 MK

LA V2



**PYRAMID** 



LABYRINTH

# Vibration-damping sheet materials



**AVP** 



MX5



**IKANET** 



**AVF** 



Pages 198 - 205

ВМ



LD13



D1D



DC NOBELL V1

# Soundproof materials





ВМЈ



Pages 206 - 208

## Sound absorbents, sheet damping and soundproofing materials

- 1 Sound absorbents absorb and reduce noise (as opposed to, for example, steel and concrete) in the room they are used in. They do not work as a noise barrier, which is why there should be a heavy and dense material behind them. The materials are porous, like mineral wool or foam plastic. If there are requirements for hygiene, cleaning or protection from oil or water spray (e.g. in food machinery, engine compartments, hospital equipment), the materials can be fitted with a tight, thin surface film.
- 2 Sheet damping materials dampen sound propagation in solid materials such as metal, wood and plastic. These materials are particularly effective against impact loads, and they come as either damping cardboard, film or mass, and are mounted (adhered) to the surface which is to be dampened.
- 3 Soundproof materials isolate against sound penetration, for example in screen wall constructions. These materials are heavy and are used either alone as soundproof curtains or for audio improvement of an existing construction.

There are also sound materials which combine the above properties, such as combined sound absorbents and sheet damping material, just as a number of the soundproof materials have sheet damping properties.

Sound absorber IKALON 135 MK

## **Product description**

Very effective sound absorbent, fitted with self-adhesive on one side. The sound absorbent is made of compressed polyether granulate with open cells held together with a binding agent. This gives the material a relatively high density and a "speckled appearance".

## **Application**

For sound absorption for noise damping of machinery and equipment, including in machine enclosures, engine compartments and sound effects where high noise reduction is required.

IKALON 135 is extremely robust when exposed to mechanical stresses such as shock and wear. In the thin sheet constructions, IKALON MK 135 will potentially act as an antivibration damper on sheet vibrations.

#### **Acoustic data**

The material's sound-damping property depends on the absorption coefficient that indicates the ratio of absorbed and incident sound energy. This means the larger the absorption coefficient, the better the noise damping. The absorption coefficient depends on the frequency and material thickness, see the graphs to the right.

#### **Assembly**

The underlay is cleaned of dust, grease, moisture and other contaminants. Even an underlay like IKALON must be at room temperature (about 20  $^{\circ}$ C) before starting the assembly.



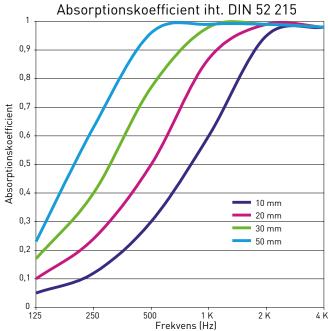
Cut with a sharp knife or similar before the protective paper is removed.



Absorbent underlay, such as untreated wooden boards, should be primed with a contact adhesive type 555.

Mechanical attachment: Under extreme conditions (bad gluing surface, downward-facing underlay, difficult installation conditions), further mechanical fastening is recommended, such as screws and washers. Mechanical mounting is always recommended during assembly of the two heaviest types (30 and 50 mm) on the downward-facing surfaces.





	Product data			
Thickness	10 mm	20 mm	30 mm	50 mm
Width	1.0 m	1.0 m	1.0 m	1.0 m
Length	2.0 m	2.0 m	2.0 m	2.0 m
Density	135 kg/m³	135 kg/m³	135 kg/m³	135 kg/m³
Adhesiveness	15 N/cm²	15 N/cm²	15 N/cm²	15 N/cm²
Colour	Shades of grey			
Temperature range	-40 °C to +100 °C			
Properties	Flame retardant according to MVSS 302, class SE. The material is self-extinguishing and we recommend that it is placed at least 20 cm from hot metal parts. It must not be placed where it could soak up flammable liquids.			

## Sound absorber

## **Product description**

Self-adhesive foam absorbent which is covered with aluminised polyester film. The sound absorbent is made of compressed polyether granulate and has a silver protective film.

#### **Application**

For sound absorption when noise damping machinery and equipment, including in machine enclosures, engine compartments within the food industry and in places where moisture occurs. The film protects against the ingress of water, certain oils, microorganisms, etc., and is easy to clean.

IKALON 135 ALU/MK is robust against mechanical stresses.

In the thin sheet constructions, IKALON ALU/MK 135 will potentially act as an anti-vibration damper on sheet vibrations. The aluminium foil is also heat-reflective against radiant heat.

#### **Acoustic data**

The material's sound-damping property depends on the absorption coefficient that indicates the ratio of absorbed and incident sound energy. This means the larger the absorption coefficient, the better the noise damping. The absorption coefficient depends on the frequency and material thickness, see the graphs to the right.

#### **Assembly**

The underlay is cleaned of dust, grease, moisture and other contaminants. Even an underlay like IKALON must be at room temperature (minimum 15  $^{\circ}$ C) before starting assembly.



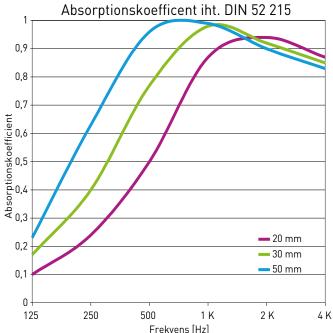
Cut with a sharp knife or similar before the protective paper is removed.



Absorbent underlay, such as untreated wooden boards, should be primed with a contact adhesive type 555.

Mechanical attachment: Under extreme conditions (bad gluing surface, downward-facing underlay, difficult installation conditions), further mechanical fastening is recommended, such as screws and washers. Mechanical mounting is always recommended during assembly of the two heaviest types (30 and 50 mm) on the downward-facing surfaces.





	Product data		
Thickness	20 mm 30 mm 50 mm		
Width	1.0 m	1.0 m	1.0 m
Length	1.0 m	1.0 m	1.0 m
Density	135 kg/m³	135 kg/m³	135 kg/m³
Adhesiveness	15 N/cm²	15 N/cm²	15 N/cm²
Colour	Shades of grey foam with a silver foil surface		
Temperature range	-40 °C to +100 °C		
Properties	Flame retardant according to MVSS 302, class SE. The material is self-extinguishing and we recommend that it is placed at least 20 cm from hot metal parts. It must not be placed where it could absorb flammable liquids.		

Sound absorber IKALON MF - MK

## **Product description**

Effective sound absorbent which is covered with a flexible polyurethane film on one side and has self-adhesive on the other side. The sound absorbent is made of polyether and is homogeneous grey expanded plastic with a light grey or black protective film.

## **Application**

For sound absorption when noise damping machinery and equipment, including in machine enclosures, engine compartments within the food industry and in places where moisture occurs. The film protects against the ingress of water, certain oils, microorganisms, etc., and is easy to clean.

On thin sheets, it is advantageous to use Ikalon MF in connection with a soundproof film such as AVP or AVF. This dampens the vibrations more efficiently and soundproofing is increased.

#### **Acoustic data**

The material's sound-damping property depends on the absorption coefficient that indicates the ratio of absorbed and incident sound energy. This means the larger the absorption coefficient, the better the noise damping. The absorption coefficient depends on the frequency and material thickness, see the graphs to the right.

#### Assembly

The underlay is cleaned of dust, grease, moisture and other contaminants. Even an underlay like IKALON must be at room temperature (about 20 °C) before starting the assembly.

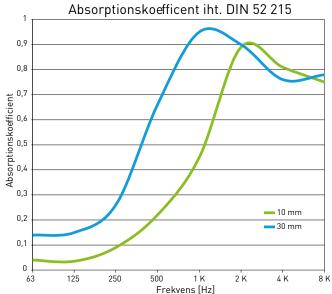


Cut with a sharp knife or similar before the protective paper is removed.



Absorbent underlay, such as untreated wooden boards, should be primed with a contact adhesive type 555.





	Product data		
Thickness	10 mm 20 mm 30 mm		
Width	1.2 m	1.2 m	1.2 m
Length	2.0 m	2.0 m	2.0 m
Density	30 kg/m²	30 kg/m³	30 kg/m³
Adhesiveness	13 N/cm²	13 N/cm²	13 N/cm²
Colour	Grey foam with a light grey or black foil		
Temperature range	-20 °C to +80 °C		
Properties	Flame retardant according to FMVSS 302. The material may burn when the temperature becomes sufficiently high and must therefore be situated at least 20 cm from hot metal parts, and must not be placed where it could absorb flammable fluids. Strong heating releases toxic gases that may be harmful.		

## Sound absorber

## **Product description**

Self-adhesive sound absorbent foam material that has a textured surface (see the sketch below). The sound absorbent is made of charcoal grey polyester foam.

## **Application**

As sound-absorbing casing for printer boxes, machine guards and the like. Can be used as soundproofing in ceilings in drivers' cabs. The sound absorbent is particularly suitable for damping high-frequency noise, i.e. sound waves with a short wave length such as ultrasound.

#### **Acoustic data**

The material's sound-damping property depends on the absorption coefficient that indicates the ratio of absorbed and incident sound energy. This means the larger the absorption coefficient, the better the noise damping. The absorption coefficient depends on the frequency and material thickness; see the graph to the right.

#### **Assembly**

The underlay is cleaned of dust, grease, moisture and other contaminants. Even an underlay like IKALON must be at room temperature (about 20 °C) before starting assembly.



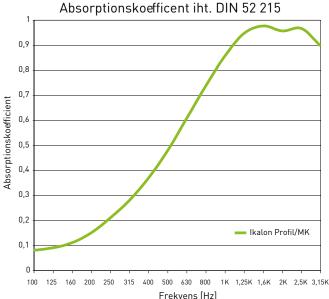
Cut with a sharp knife or similar before the protective paper is removed.



Absorbent underlay, such as untreated wooden boards, should be primed with a contact adhesive type 555.

Mechanical attachment: Under extreme conditions (bad gluing surface, downward-facing underlay, difficult installation conditions), further mechanical fastening is recommended, such as screws and washers.





	Product data	
Thickness	See the sketch above	
Width	1.2 m	
Length	2.0 m	
Density	33 kg/m³	
Coefficient of ther- mal conductivity	0.036 w/m °C	
Colour	Charcoal grey	
Temperature range	-30 °C to +90 °C. For short times, up to 120 °C	
Properties	Flame retardant according to FMVSS 302. The material may burn when the temperature becomes sufficiently high and must therefore be situated at least 20 cm from hot metal parts. It must not be placed where it might absorb flammable fluids. Strong heating releases toxic gases that may be harmful	

Sound absorber LA SE

## **Product description**

Effective sound absorbent covered with aluminised polyester film and self-adhesive.

#### **Application**

For sound absorption when noise damping machinery and equipment, including in machine enclosures, engine compartments, as well as in the food industry where there are high fire requirements. Other uses include in the wind turbine industry, for buses and in shipbuilding.

On thin sheets it is advantageous to use LA SE in connection with an anti-vibration film such as AVP or AVF. This dampens the vibrations more efficiently and soundproofing is increased.

#### **Acoustic data**

The material's sound-damping property depends on the absorption coefficient that indicates the ratio of absorbed and incident sound energy. This means the larger the absorption coefficient, the better the noise damping. The absorption coefficient depends on the frequency and material thickness, see the graphs to the right.

## **Assembly**

The underlay is cleaned of dust, grease, moisture and other contaminants. Even an underlay like LA SE must be at room temperature (about 20 °C) before starting assembly.

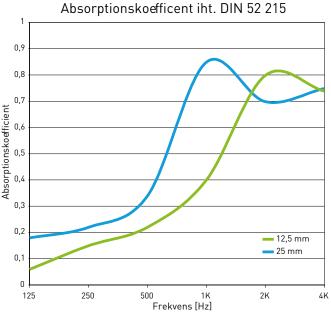


Cut with a sharp knife or similar before the protective paper is removed.



Absorbent underlay, such as untreated wooden boards, should be primed with a contact adhesive type 555.





	Product data		
Thickness	12.5 mm 25 mm		
Width	1.0 m	1.0 m	
Length	1.0 m	1.5 m	
Surface weight	1 kg/m²	2 kg/m²	
Colour	Grey foam with aluminised film		
Temperature range	-40 °C to +120 °C		
Properties	The film surface on LA SE is heat reflective and can easily be cleaned. LA SE is self-extinguishing and meets the following fire standards: ASTM D 2863-74, ASTM D 1692, FMVSS 302 and UL 94 HBF		

Sound absorber LA V2

## **Product description**

Self-adhesive expanded plastic absorbent with a durable surface of perforated PVC film (Perforated area: 2 %).

#### **Application**

Sound absorption when noise damping machinery, vehicles and appliances.

The surface film is easy to clean, increases resistance to mechanical impact and looks nice. This makes the absorbent especially suitable for use where it is visible, for example in drivers' cabs.

## **Acoustic data**

The material's sound-damping property depends on the absorption coefficient that indicates the ratio of absorbed and incident sound energy. This means the larger the absorption coefficient, the better the noise damping. The absorption coefficient depends on the frequency and material thickness; see the graph to the right.

## **Assembly**

The underlay is cleaned of dust, grease, moisture and other contaminants. The attaching is easiest if the sheet is bent and attached along the shorter side first. Press the sheet firmly into place.

Even an underlay like LA V2 must be at room temperature (minimum 15 °C) before starting assembly.

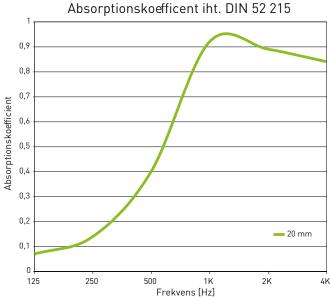


Cut with a sharp knife or similar before the protective paper is removed.



Absorbent underlay, such as untreated wooden boards, should be primed with a contact adhesive type 555.





	Product data	
Thickness	10 mm	20 mm
Width	1.2 m	1.2 m
Length	1.5 m	1.5 m
Surface weight	0.9 kg/m²	2.0 kg/m²
Adhesiveness	15 N/m²	15 N/m²
Colour	Grey expanded plastic with black or grey surface film	
Temperature range	-30 °C to +90 °C	
Properties	Self-extinguishing in accordance with FMVSS 302. The material may burn when the temperature becomes sufficiently high and must therefore be situated at least 20 cm from the hot metal parts. In addition to this, it must not be placed so that it can absorb flammable fluids	
Storage	Store at temperatures of 0 °C to 30 °C	

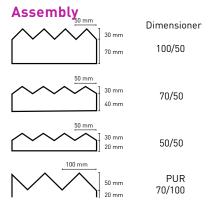
Sound absorber PYRAMID

#### **Product benefits**

- 1 Easy to mount with contact adhesive.
- 2 Environment-friendly as the absorbent does not sprinkle fibres or degasser halogens or CFCs.
- 3 Lower transport costs due to the material's low weight.
- 4 Super sound-absorbing properties due to the profiled surface.
- 5 The absorbent is available in individual colours.
- 6 Varying thicknesses of the absorbent can be ordered.
- 7 Available in various types of foam and pyramid.

## **Absorbent types**

Profiled on one side as follows:





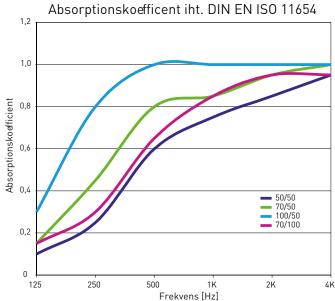
Can be cut with a sharp knife or the like.



Bonding: The underlay is cleaned of dust, grease, moisture and other contaminants. VIKAS type acoustical adhesive (10 L tin) is applied to one surface.

Even an underlay like Vikas Pyramid must be at room temperature (about 20 °C) before starting assembly. Consumption: about  $0.5\ l/m^2$  of adhesive on the entire surface.





	Product data		
	PYRAMID	PYRAMID PUR	
Basic material	Melamine	Polyether – PUR – soft foam	
Dimensions	1200 x 600 mm Dimension tolerances according to DIN 7715 P3	1000 x 1000 mm Dimension tolerances according to DIN 7715 P3	
Density*	$9.5 \pm 1.5 \text{ kg/m}^3$ according to EN ISO 845	5.27 to 32.5 kg/m³ according to EN ISO 845	
Colour	White, grey, anthracite Other colours can be offered for orders > 100 m²	Anthracite Other colours can be offered for orders > 100 m²	
Sound absorption coefficient	α according to DIN EN ISO 11654		
Temperature, renewable	150 °C	80 °C	
Fire properties	Flame retardant according to DIN 4102 B1	Without colour surface B3, very flammable. With standard colour surface B2, flammable according to DIN 4102	
Test certificate signed by an accredited testing company	P-NDS04-291	P-NDS04-204	

The absorbents may have pores of different sizes depending on the surface.

<sup>\*</sup>According to EN ISO 845 performed on test subjects with the following minimum dimensions: 250 x 250 x 250 mm.



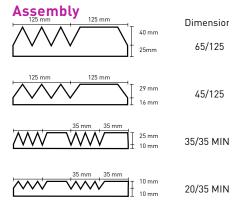
Sound absorber LABYRINTH

#### **Product benefits**

- 1 Easy to mount with contact adhesive.
- 2 Environment-friendly as the absorbent does not sprinkle fibres or degasser halogens or CFCs.
- 3 Lower transport costs due to the material's low weight.
- 4 Super sound-absorbing properties due to the profiled surface.
- 5 The absorbent is available in individual colours.
- 6 Varying thicknesses of the absorbent can be ordered.
- 7 Available in various types of foam and pyramid.

## **Absorbent types**

Profiled on one side as follows:





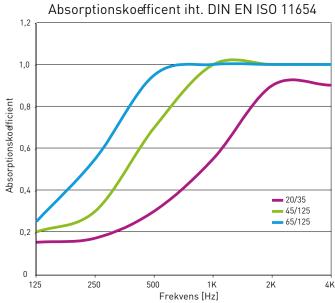
Can be cut with a sharp knife or the like.



Bonding: The underlay is cleaned of dust, grease, moisture and other contaminants. VIKAS type acoustical adhesive (10 L tin) is applied to one surface.

Even an underlay like Vikas Pyramid must be at room temperature (about 20 °C) before starting assembly. Consumption: about 0.5 l/m² of adhesive on the entire surface.





	Product data	
Basic material	Polyether – PUR – soft foam	
Dimensions	1000 x 1000 mm Dimension tolerances according to DIN 7715 P3	
Density*	5.27 to 32.5 kg/m³ according to EN ISO 845	
Colour	Anthracite Other colours can be offered for orders > 100 m²	
Sound absorption coefficient	α according to DIN EN ISO 11654	
Temperature, renewable	80 °C	
Fire properties	Without colour surface B3, very flam- mable. With standard colour surface B2, flammable according to DIN 4102	
Test certificate signed by an accredited testing company	P-NDS04-204	

The absorbents may have pores of different sizes depending on the surface. \*According to EN ISO 845 performed on test subjects with the following minimum dimensions:  $250 \times 250 \times 250$  mm.



Soundproof sheet AVP

## **Product description**

The AVP sheet is made of heavy fillers mixed with an EVA-based rubber. The sheet has a self-adhesive with protection paper.

## **Application**

For damping vibrations in thin sheets, as well as increasing the sound reduction value. Used in the machinery, shipping, transport and construction industries for noise damping of machines, vehicles, boats, pipes and ducts, etc.

The sheet is used, for example, in engine compartments, cabinets, partitions and machine enclosures.

#### **Acoustic data**

The material's sound-absorbing properties are based on increases of the loss factor and reduction value. The loss factor is a measure of the vibration energy converted into heat, and the reduction value represents the isolating capacity against sound penetration.

The reduction value is shown in the graphs to the right.

#### **Assembly**



Cut with scissors or a knife before removing the protective paper. The underlay is cleaned of dust, grease, moisture and other contaminants.



Attachment is easiest if the sheet is bent and attached along the shorter side first.

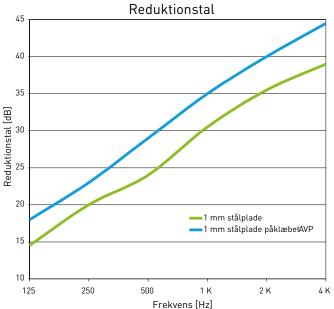
Press the sheet firmly into place and if necessary use a roll so that air bubbles are avoided (air bubbles degrade the damping). The items can put be under pressure to achieve better adhesion.

The underlay and sheet must be at room temperature (about 20 °C) prior to assembly.

AVP may be softened and shaped by gentle heating with a heat gun.

For vertical or downwards mounting, the adhesive must be supplemented with mechanical fastening, e.g. screws and washers.





	Product data	
Thickness	3.5 mm	
Width	0.75 m	1.0 m
Length	1.0 m 1.5 m	
Surface weight	7.5 kg/m²	
Adhesiveness	10 N/m²	
Colour	Black	
Temperature range	-30 °C to +100 °C, for short periods up to +170 °C	
Properties	Self-extinguishing in accordance with FMVSS 302	
Storage	Store at temperatures of 0 °C to 30 °C	

Soundproof sheet MX5

## **Product description**

The soundproof and plate damping material MX5 is a heavy thermoplastic plate. MX5 is made from a polymer base of synthetic rubber and thermoplastic materials. MX5 is selfadhesive, and the adhesive is protected by a thin film.

MX5 is an alternative for products which must not contain PVC.

## **Application**

For damping vibrations in thin sheets, as well as increasing the sound reduction index. MX5 is particularly suited to affixing to complex constructions as the material is very flexible and can easily be bent over curved surfaces.

Used in the machinery, shipping, transport and construction industries for

noise damping on machines, vehicles, ships, pipes, ducts, etc

MX-5 is used, for example, in engine compartments, cabinets, partitions and in machine enclosures and ventilation ducts.

Can also be used as a soundproof curtain

#### **Acoustic data**

Typical transmission loss curve of MX5 according to ISO R140, free-hanging curtain, see to the right.

## **Assembly**



Cut with scissors or a knife before removing the protective paper. The underlay is cleaned of dust, grease, moisture and other contaminants.



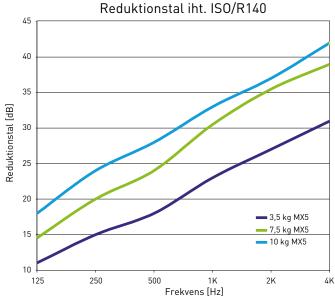
Attachment is easiest if the sheet is bent and attached along the shorter side first.

Press the sheet firmly into place and if necessary use a roll so that air bubbles are avoided (air bubbles degrade the damping). The items can put be under pressure to achieve better adhesion.

The underlay and sheet must be at room temperature (about 20 °C) prior to assembly.

For downwards mounting the adhesive must be supplemented with mechanical fastening, e.g. screws and washers.





	Product data	
Colour	Black	
Density	3.5 kg/m²	
Thickness*	(approx.) 1.8 mm	
Temperature range (static)	-30 °C to +65 °C	
Fire class	FMVSS302: PASS	

<sup>\*</sup>Created according to weight tolerance



Soundproof sheet IKANET

## **Product description**

IKANET is a soft magnetic damping sheet composed of 70 % barium ferrite and 30 % synthetic material. IKANET has rubber's flexible properties.

## **Application**

For damping noise, for example steel plate processing. Especially useful where you do not want to affix a permanent soundproof plate. Quick to mount – easy to remove. Can be used again and again; can only be applied to magnetic materials (iron). Is used, among other things, in body workshops, service stations, record shops, car repair shops, Klein media, polishers and places that work with sheet metal ducts. Also used for experiments prior to gluing or spraying of the usual Vikas soundproof sheets type AVP, MX5 & AVF and damping mass type DC. IKANET can be used on sheets with a thickness of up to 5 mm.

#### **Acoustic data**

The effect is based on an increase in the loss factor of the sheet construction. The achievable noise reduction therefore varies from a few dB up to about 30 dB.

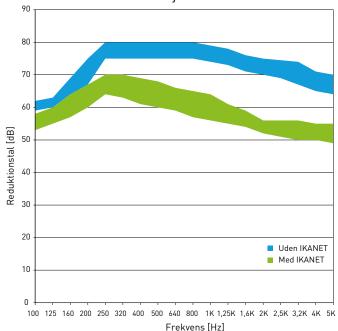
#### **Assembly**

Only a minor part (30-60 %) of the noise-causing construction surface needs to be covered by IKANET to achieve a significant noise reduction.

IKANET is placed in the middle of the respective surfaces. For curved surfaces, IKANET is cut into strips.



Støjdæmpning af blikkanal (0,8 mm) der bearbejdes med hammer



	Product data
Surface weight	4.0 kg/m²
Thickness	1.5 mm
Width	0.7 m
Length	1.0 m
Adhesiveness	450 kg/m²
Colour	Dark brown
Temperature range	-15 °C to +60 °C

## **Product description**

AVF is made from a PVC base, mixed with selected heavy fillers.

The sheet comes in two thicknesses with a surface weight of 7 to  $14 \text{ kg/m}^2$ .

#### **Application**

For damping vibrations in sheet materials, as well as increasing constructions' sound reduction index. Used in the machine, shipping, transport and building industries for noise reduction of machines, vehicles, boats, pipes and ducts, etc., as well as in engine compartments, partitions and machine enclosures.

#### **Acoustic data**

The AVF sheet's noise-damping effect is due to the small bending stiffness, high loss factor and high surface weight.

The loss factor, which is a measure of the vibration energy which is converted into heat, typically ranges from 0.001 to 0.01 for thin sheet constructions.

If the AVF sheet is stuck onto a 1 mm steel plate, a loss factor of 0.1-0.2 and up to 0.3 is obtained with a 5 mm thick sheet.

The reduction value of airborne noise is illustrated in the graphs to the right.

#### **Assembly**



It is cut with a sharp knife and stuck to the surfaces which are to be damped. If greater sound reduction is desired, the sound film can be glued to a sound absorbent, for example, type Ikalon 135. The absorbent is mounted towards the noise source.

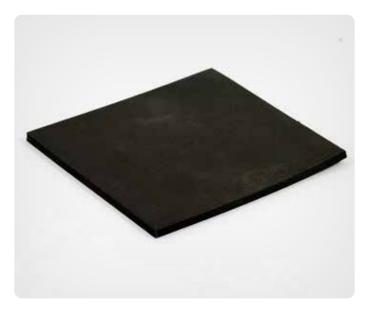


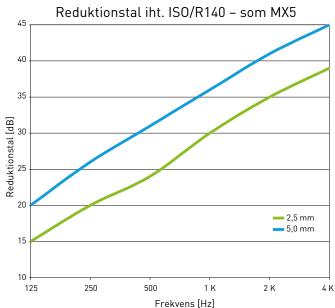
Bonding: For sticking, use contact adhesive type 555, applied to the surfaces using a brush or a fine-toothed putty knife. Use about 0.3 L/m2 for non-absorbent surfaces. After assembly with adhesive, the temperature should not exceed 50 °C.

It is crucial for the adhesion that preparation (cleaning, degreasing, etc.) is done carefully, as well as that the temperature conditions are correct. It must also be ensured that the film has full adhesive contact with the surface – use a rubber hammer or hand roller for assembly.

Mechanical attachment: Under extreme conditions (bad gluing surface, downward-facing underlay, difficult installation conditions), further mechanical fastening is recommended, for example screws and washers.

Surface treatment: Can be painted, for example with polyurethane paint.





	Product data	
Thickness	2.5 mm	5 mm
Width	1.2 m	1.2 m
Roll length	10 m	5 m
Surface weight	7 kg/m²	14 kg/m²
Colour	Black	
Temperature range	-30 °C to +80 °C	
Properties	Self-extinguishing and meets the requirements of ASTM D 1692-68	

Soundproof sheet BM

## **Product description**

BM is made of PVC plastisol with a barite (baryta) filler.

BM comes in one thickness which has a surface weight of:  $7.5 \text{ kg/m}^2$ .

## **Application**

BM is used as soundproof sheet, i.e. it is directly bonded to sheet constructions which are intended to be soundproof. Use a contact adhesive (type 555).

BM is resistant to water and certain types of oil.

#### **Acoustic data**

The material's excellent sound damping properties (reduction value) are based on a high loss factor and great surface weight. The loss factor is a measure of the vibration energy which is converted to heat, and the reduction value expresses the isolating capacity against sound penetration.

## **Assembly**



The BM sheet is cut with a sharp knife or similar, and is glued to the underlay with a contact adhesive (type 555).

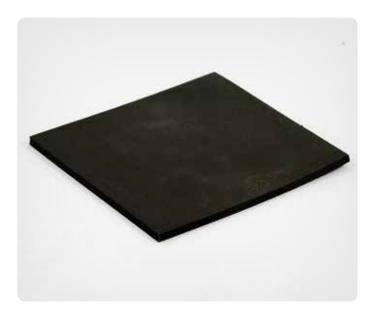


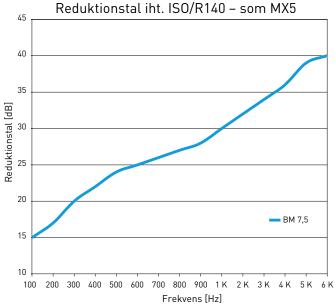
The glue is applied to the sheet and the underlay using a brush or a fine-toothed putty knife.

It is crucial for the adhesion that preparation (cleaning, degreasing, etc.) is done carefully, just as the gluing should not be carried out under room temperature (20 °C). The film must have full adhesive contact with the surface – use a rubber hammer or hand roller for applying it.

After assembling with glue, the temperature should not exceed 50  $^{\circ}$ C.

Under extreme conditions (bad gluing surface, downward-facing underlay, difficult installation conditions), further mechanical fastening is recommended, such as screws and washers.





	Product data	
Thickness	4.0 mm	5.0 mm
Width	1.25 m	1.0 m
Roll length¹	3.0 m	1.5 m
Surface weight	7.5 kg/m²	10 kg/m²
Adhesiveness	10 N/m²	
Colour	Black	
Temperature range	-30 °C to +65 °C	
Properties	Self-extinguishing according to FMVSS 302, ASTM D 1692-68. Strong heating releases toxic gases that can be harmful if inhaled.	

<sup>1</sup>available in other lengths for larger deliveries



Soundproof sheet **LD13** 

## **Product description**

LD-13 is a self-adhesive damping sheet. The sheet is impregnated so that it does not absorb water and mineral oil.

## **Application**

For damping vibrations in thin sheets of metal. Used, for example, in ducts, steel cupboards, furniture, washing machines, office machines and in vehicles and steel panels.

#### **Acoustic data**

The material's sound damping properties are primarily based primarily on an increase in the loss factor of the overall construction. The loss factor is a measure of the vibrational energy converted into heat. If LD 13 is stuck to a 1 mm steel plate, the loss factor increases from about 0.001 to 0.1 or 0.2.

The loss factor is temperature dependent, as shown in the graphs to the right. Likewise, it is clear from the graphs that the loss factor is dependent on the frequency.

#### **Assembly**



Cut with scissors or knife before removing the protective paper.



The underlay must be cleaned of dust, grease, moisture or other contaminants.

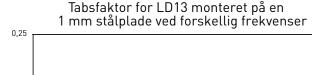
Attachment is easiest if the sheet is bent and attached along the shorter side first. LD-13 can be softened and shaped by gentle heating with a heat gun.

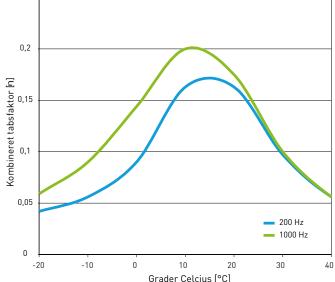
Press the sheet firmly into place and if necessary use a roll so that air bubbles are avoided (air bubbles degrade the damping). The items can put be under pressure to achieve better adhesion.

The underlay and sheet must be at room temperature (about 20 °C) prior to assembly.

Absorbent substrates such as untreated wooden boards should be primed with a contact adhesive type 555.







	Product data
Thickness	1.6 mm
Width	1.0 m
Length	1.02 m
Surface weight	1.6 kg/m²
Adhesiveness	15 N/cm² at 20 °C
Colour	Grey-black
Temperature range	-30 °C to +120 °C
Storage	Store at temperatures of 0 °C to 30 °C

Sandwich cardboard D1D

## **Product description**

D1D is a bitumen-impregnated viscoelastic sheet which is covered with self-adhesive on both sides.

## **Application**

For damping oscillations in metal and wooden structures, as per the sandwich principle. The sheet is placed between the construction that is intended to be noise damped and a counter-sheet whose thickness is adapted according to the thickness of the base construction. Is suitable for thin sheet constructions and for greater wall thicknesses, and can be used in machine constructions, conveyor systems, vehicles, stairs, floor plates, loading docks, floors, etc.

#### **Acoustic data**

The material's sound damping qualities depend on an increase in the mechanical loss factor, which is a measure of the vibration energy which is converted into heat energy. The best results are achieved if the counter-sheet and the base construction have the same thickness, but good results are obtained at thickness ratios up to 4:1.

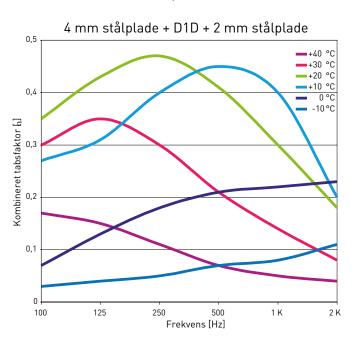


Fig. 1 Shows the loss factor's dependence on the frequency at different temperatures for a construction consisting of a 4 mm steel plate, D1D and a 2 mm steel counter-sheet.





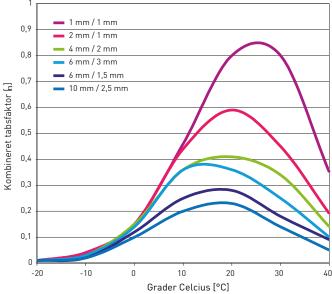


Fig. 2
The loss factor's dependence on the temperature at a frequency of 200 Hz. The curves shown indicate the thickness of the basic construction in steel and the counter-sheet in steel.

	Product data	
Surface weight	1.3 kg/m²	
Sheet format	1 x 0.6 m x m	
Thickness	1.3 mm	
Colour	Black	
Temperature	-30 °C to +90 °C	
Adhesiveness	40 N/cm² (after compression at 32 N/cm² for 5 min.)	
Storage	Between 0 °C and 30 °C	

Damping mass DC NOBELL V1

## **Product description**

Water-based, polymer-borne viscoelastic damping mass with low density and good fire retardant properties.

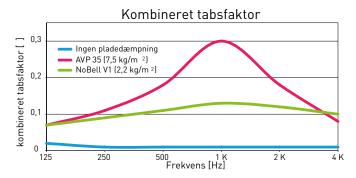
#### **Application**

Made to dampen sheet vibrations and structure-borne noise produced by either stationary mechanical oscillations or impulse influences. Since NoBell is a liquid damping mass, it is particularly suitable for applying to irregular surfaces. Typical applications are car bodies, railway wagons, diesel locomotives, ships, air ducts, doors, metal stairs, machine guards, internal fittings, conveying systems, household appliances, data systems, etc. NoBell is highly adhesive and water-resistant after drying Due to its low density, it lends itself to be used in lightweight constructions. The damping mass is resistant to many solvents and oils after hardening. Also contains an anti-corrosion agent and has a thermal insulating ability.

#### **Acoustic data**

The material's vibration-damping characteristics are based on an increase in the loss factor. The loss factor is a measure of the vibrational energy which is converted into heat. The figure below shows the loss factor of a step of 2 mm galvanised steel plate with 8 mm diameter holes. The curves show the effect of applying AVP 3.5 mm sheet damping material and NoBell V1 damping mass, respectively.

The loss factor depends on temperature conditions. For example, the combined loss factor will be reduced by half if the temperature is lowered to 0  $^{\circ}$ C.



#### Consumption

For optimal resonance and sound damping, an even layer of dry 1.0-4.0 mm film should be applied, depending on the sheet thickness

The following table shows the approximate thickness and consumption of DC NoBell V1 when damping steel plates:

Plate thickness	DC NoBell V1 (dry)	DC NoBell V1 (wet)
1 mm	1.0 mm	1.6 mm
2–4 mm	1.5–2.5 mm	2.5-4.2 mm
5–8 mm	3–4 mm	5.0-6.7 mm

#### **Assembly**

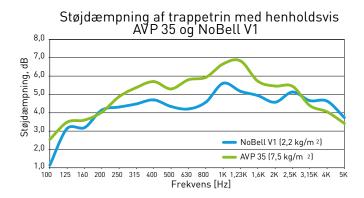
The achieved noise damping for the step is shown in the following figure:

NoBell can be sprayed, painted or rolled onto a cleaned surface. Untreated steel plates (stainlesssteel plates) should



be primed prior to damping mass being applied. The damping mass is applied in layers in 0.5–1.0 mm wet film which has to dry before the next layer is applied. The drying time is 6–12 hours at normal room temperature. Lower temperatures increase the drying time considerably. The product dries and hardens in two phases. During the first 6–12 hours the water is eliminated, and over the subsequent 7–14 days, a chemical hardening takes place. The hardening time depends on temperature. After the first phase, the film is dry, and the damping effect will then be approximately 80% of the damping which will be achieved after the second phase. A new layer of NoBell can be applied after about 12 hours, but it is recommended that you test a small area before application.

In case of lack of space, you can apply, for example, 50 % on either side of the metal sheet without altering the properties of the material. Immediately after spraying, the pressure feed container, tubing and spray gun should be cleaned thoroughly with water (this also applies to the barrel pump system).



	Product data
Density	990 kg/m³ in wet state
Dry matter	64 ± 2 %
Application temp.	-30-+100 °C
Colour	Wet state: grey-white. After drying: light brown
Odour	None after drying
Dilution	Water
Packaging	1, 5, 20, or 200-litre metal containers. Also available in 0.6-litre spray bottles
Properties	VOLVO meets the standard STD 5031, 1 point S4.3(a)
Flash point	> 100 °C
Storage	6 months in unopened tins at +2 to +20 °C.

## Soundproof curtain

## **Product description**

SPG is a transparent soundproof curtain made from soft PVC.

#### **Application**

For screening off noisy machines and workplaces, as well as for sectioning of premises in noisy and non-noisy areas. The soundproof curtain can also be used in openings where the passage or thoroughfare of, for example, materials, is required.

## Acoustic data

The soundproof curtain's reduction value is shown in the following dimensioning curve. The noise damping achieved by screening off will be in about 5–10 dB – although it depends on factors such as the room's acoustics, the noise frequency composition, the height of the curtains and the sound source's location relative to the soundproof curtains.

#### **Assembly**

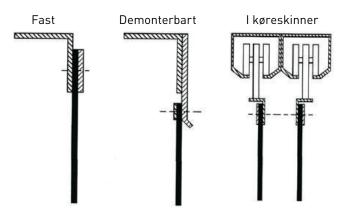
The individual curtain tracks are installed free hanging. The suspension can be fixed or on running rails so that the curtain can be slid to the side; see the examples below.

The overlap between the tracks should be 100 to 200 mm

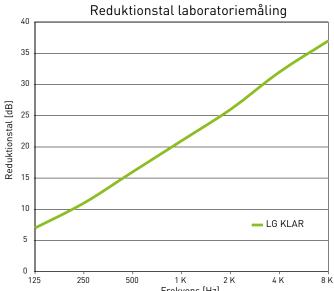
NB! The soundproof curtain should not be suspended from tracks which are longer than 3–4 m or the dead weight will stretch the material.

If longer lengths are needed, clamp rails of should be fitted made of, for example, steel strips.

## **Assembly examples**







	Product data		
Surface weight	3.7 kg/m²		
Thickness	3.0 mm		
Width	1.2 m	Also available in other widths	
Length	20 m	Also available in other lengths	
Weight	4.5 kg/lb. md.		
Conduction	0.15 W/mK		
Colour	Transparent		
Temperature range	-30 °C to +40 °C (for short amounts of time, up to 100 °C)		
Properties	Self-extinguishing and does not continue to glow. Tested in accordance with DIN 53382		
Storage	Store at temperatures of 0 °C to 30 °C		

## **Product description**

BMJ is made of PVC plastisol with a barite (baryta) filler. The soundproof curtain has a top coat of black patterned PVC film and a base fabric of jute. The jute provides shape stability and increases the strength against tensile stresses. BMJ is available in four thicknesses with surface weights of:  $5-7.5-10-5\ kg/m^2$ .

## **Application**

For screening off noisy machines and workplaces, as well as for sectioning premises in noisy and non-noisy areas. Can also be used in openings where the passage or thoroughfare of materials is required. BMJ may also be used as a soundproofing sheet, i.e. directly applied to sheet constructions which require soundproofing. Use a contact adhesive (type 555). BMJ is resistant to water and certain types of oil.

#### **Acoustic data**

The material's excellent sound damping properties (reduction value) are based on a high loss factor and great surface weight. The loss factor is a measure of the vibration energy which is converted to heat, and the reduction value expresses the isolating capacity against sound penetration.

#### **Assembly**

When hanging BMJ as a soundproof curtain, the noise damping depends heavily on factors such as the room's acoustics, the noise frequency's composition, the height of the curtain, densities and the sound source's location relative to the recipient, etc.



As a soundproof sheet: Cut the BMJ sheet with a sharp knife or similar and glue it to the underlay using contact adhesive (type 555). The adhesive is applied to the side with jute and the underlay using a brush or a fine-toothed putty knife.



It is crucial for the adhesion that preparation (cleaning, degreasing, etc.) is done carefully, just as the gluing should not be carried out under room temperature (20 °C). The film must

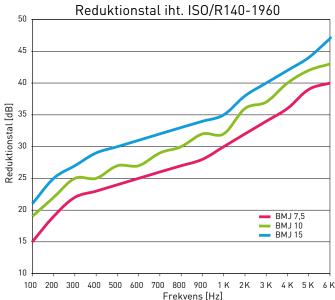
have full adhesive contact with the surface – use a rubber hammer or hand roller for applying it.

After application using glue, the temperature should not exceed 50  $^{\circ}$ C.

Under extreme conditions (bad gluing surface, downwardfacing underlay, difficult installation conditions), further mechanical fastening is recommended, such as screws and washers.

As a soundproof curtain: The individual curtain tracks are installed free hanging. The suspension may be fixed or on running rails so that the curtain can be slid to the side. The overlap between the tracks should be 10–20 cm and should moreover be fitted as tightly as possible to achieve maximum sound isolation.





	Product data		
Surface weight	7.5 kg/m²	10.0 kg/m²	15.0 kg/m²
Thickness	5 mm	6 mm	8 mm
Width	1.25 m	1.25 m	1.25 m
Roll length¹	1.5 m	1.5 m	1.5 m
Colour	Black		
Temperature range	-30 °C to +50 °C		
Properties	Self-extinguishing according to FMVSS 302, ASTM D 1692-68. Strong heating releases toxic gases that can be harmful if inhaled.		

<sup>1</sup>available in other lengths for larger deliveries



# VIKAS audio and wear mats

## **Product description**

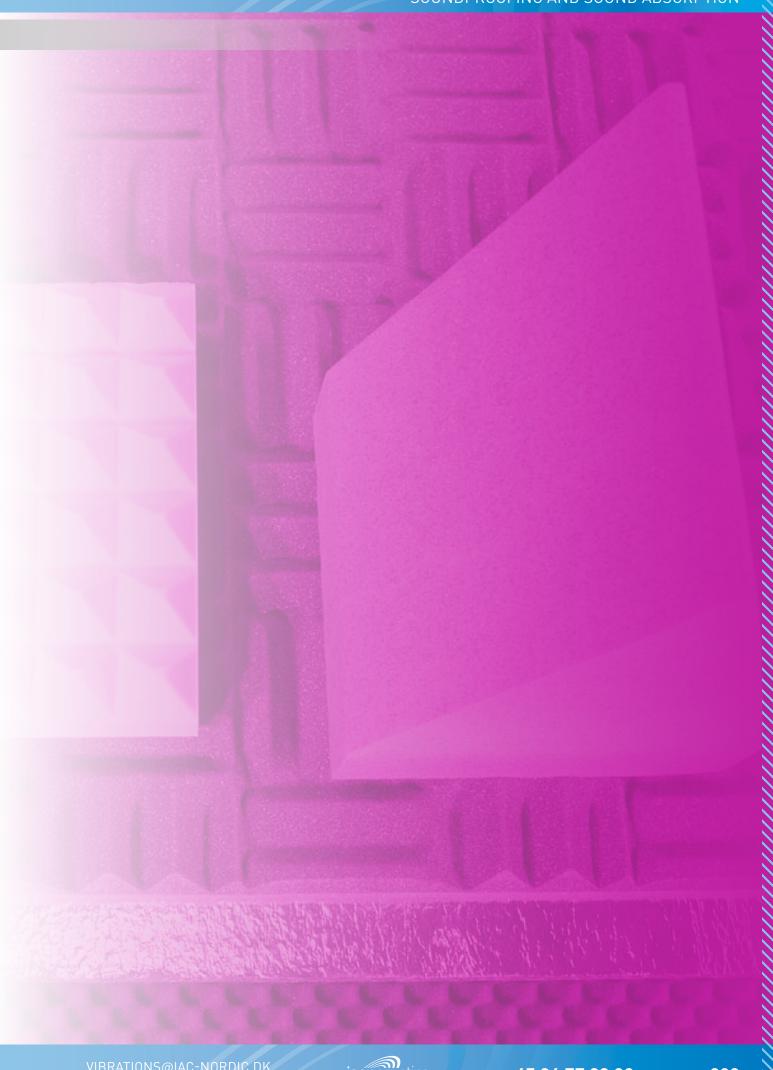
Robust and highly durable waterproof floor and soundproof mat. The mat is composed of a 5 mm heavy plastisol mat with fillers of minerals and a 5 mm spacer of cross-linked polyethylene. The square pattern on the surface provides good non-slip properties. Resistant to many oils and oil products.

## **Application**

Designed to provide sound reduction at medium and high frequencies without significantly increasing the weight of the existing construction. Especially suitable for cabins in vehicles, for example in tractor cabs, excavators, trucks, etc., as well as a floor mat.



	Product data	
Surface weight	7.5 kg/m² ± 10 %	
Thickness	10.0 mm	
Width	1.25 m	
Length	1.5 or 3.0 m	
Appearance	Black checked surface with a light grey back	
Temperature range	-30 °C to +80 °C (for short amounts of time, up to 100 °C)	
Properties	Self-extinguishing, both surfaces in ac- cordance with FMVSS 302	
Tensile strength	700 N/cm² (903 BS part A2)	
Tearing strength	60 kN/m (BS 903 part A3)	
Elongation in case of breaks	150 % (903 BS party A2)	
Resistance to liquids	Good resistance to a wide range of com- mon liquids such as water, diesel oil, anti-rust agent and brake fluid	



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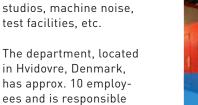












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