KRAIBURG PURASYS

vibradyn HL 3000 / HL 6000

Elastic bearings for high loads made from polyurethane

KRAIBURG
PURASYS

The problem

Vibrations that occur in buildings are a problem for a variety of reasons. On the one hand, the quality of living and working is considerably reduced. On the other hand, over a longer period of time they can lead to damages to the building.
Elastomeric bearings made of polyurethane open up many ways to limit these restrictions. A frequent cause of vibrations are track sections, which are in close proximity. Machines or technical devices, such as air conditioning systems, induce disturbing vibrations, too.

In all cases, two approaches can be followed: the isolation at the source, or the shielding of the building against external influences. The last variant is often carried out by flat bearings under the floor plate.
For many years, KRAIBURG PuraSys has been offering specially designed polyurethane products, known as **vibra**foam and **vibra**dyn, which can take loads of up to 1.9 N/mm².
However, there are problems when high weights are acting on a small area and there is no possibility of reducing the load by constructive changes.
These include e. g. heavy machinery or point bearings in the form of supports like in buildings.

The solution

For such cases with increased requirements, KRAIBURG PuraSys offers the two newly developed bearings **vibra**dyn HL 3000 and HL 6000. They can take loads of up to 3.0 N/mm² or 6.0 N/mm². Due to their high density, the two new developments stand out clearly from the previous products.
The already known color differentiation of the individual types of our **vibra**foam/**vibra**dyn series prevents material mix-ups during installation.
Such highly resilient bearings make it possible to isolate e. g. individual floors, which rest on supports instead of a whole building. This allows considerable material savings, so that –in connection with the simple processing– not only costs, but also time can be saved.

The material properties

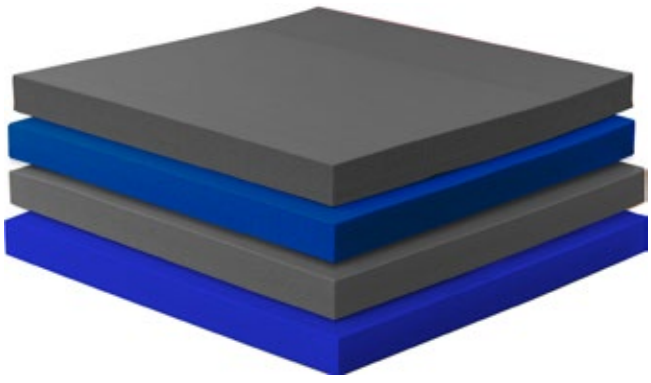
The resilience of the bearings is decisive for the structural design of the building, but the ability to isolate the vibration is mainly determined by the dynamic properties. A mass-spring system is often used as a model for this. Depending on the load, different natural frequencies occur, which must be lower than the interference frequency. KRAIBURG has once again succeeded in implementing very low natural frequencies in the development of high-load bearings.
As measurements of the Technical University of Munich have confirmed, at thicknesses of 25 mm the natural frequency is about 12 Hz for the HL 3000 bearing and about 15 Hz for the HL 6000 bearing.

Also in terms of the other characteristics, the new bearings meet the same high quality as the **vibra**foam and **vibra**dyn series. The application range also extends from -30 ° C to +70 ° C and also permits short-term load peaks. Resistance to water, oil and dilute acids and alkalis is also part of the material properties as well as a good tensile strength.

How to choose the right type

In contrast to flat bearing, the geometric dependence of the static and dynamic properties plays a greater role in small point bearings. This influence was tested experimentally as in the previous products and presented in the corresponding data sheets.
Meanwhile, the application has been facilitated by developing its own computer program, which outputs the static and dynamic properties as a function of the geometric dimensions and the load and helps in the product selection.

In principle, two types of inputs are possible: on the one hand, the optimum **vibra**foam or **vibra**dyn type can be output after entering the conditions. In this case, the highest possible utilization and the correspondingly low tuning frequency are strived for. On the other hand, the properties of a certain type can be displayed under these conditions.
The tuning frequency and the deflection are two of the most important features. The insulating effect is illustrated as a function of the frequency both in tabular and graphical form.
Operation is via a web interface, to which interested parties can access. As a result, the development of suitable solutions, especially for complex construction projects, is enormously accelerated.



vibradyn PURASYS
Product data sheet

HL 3000

KRAIBURG PURASYS
KRAIBURG PuraSys GmbH & Co. KG
Porschestraße 1
49356 Diepholz/GERMANY
www.purasys.com

Recommendations for elastic bearing

Static load: up to [N/mm²]

3.00

Dynamic load: up to [N/mm²]

4.50

Load peaks: up to [N/mm²]

10.5

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

Material closed cellular polyether-urethane

Colour blue

Delivery specifications

Thickness: 12.5 mm and 25 mm
Mats: 0.5 m wide, 2.0 m long
Stripes: max. 2.0 m long

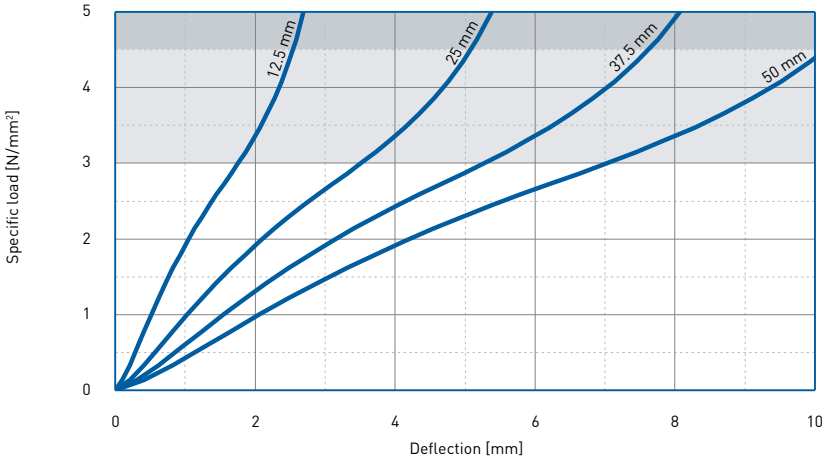
Other dimensions on request (also stamping and moulded parts)

Properties	Value	Test method	Comment
Mechanical loss factor [1]	0.09	DIN 53513 [2]	guide value
Static E-modulus [1]	17 N/mm²	DIN 53513 [2]	
Dynamic E-modulus [1]	43 N/mm²	DIN 53513 [2]	
Static shear modulus [1]	1.93 N/mm²	DIN 53513 [2]	preload 3.0 N/mm²
Dynamic shear modulus [1]	4.0 N/mm²	DIN 53513 [2]	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

[1] measured at maximum limit of static application range
[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.

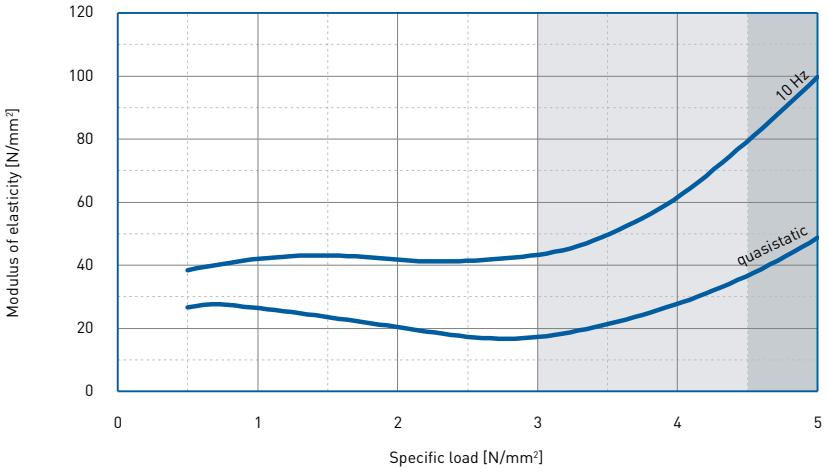
Load deflection curve



Recording of the 3rd loading; testing between steel plates with emery cloth of granulation K 120 at room temperature measured at v = 0.2 N/mm² / sec

Form factor q = 3

Modulus of elasticity

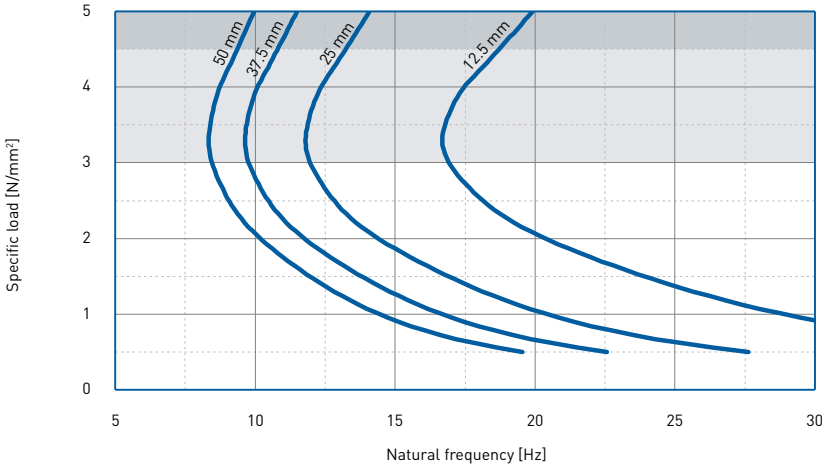


Dynamic test: sinusoidal excitation with an oscillating range of ± 0.11 mm at 10 Hz

Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve

Test according to DIN 53513
Form factor q = 3

Natural frequency



Natural frequency of a single-degree-of-freedom system consisting of a fixed mass and an elastic bearing consisting of PURASYS **vibra**dyn HL 3000 on a stiff subgrade.

Form factor q = 3

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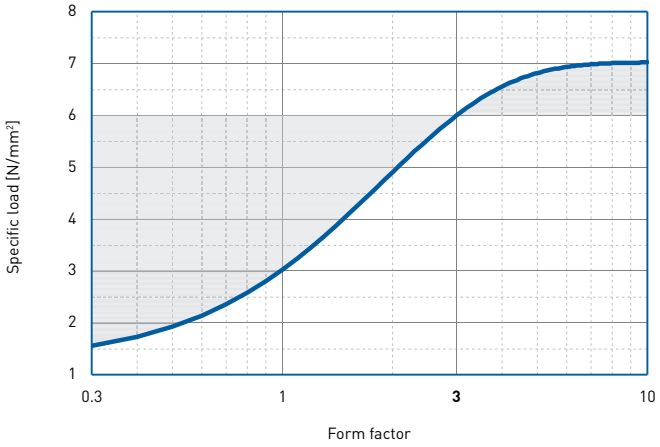
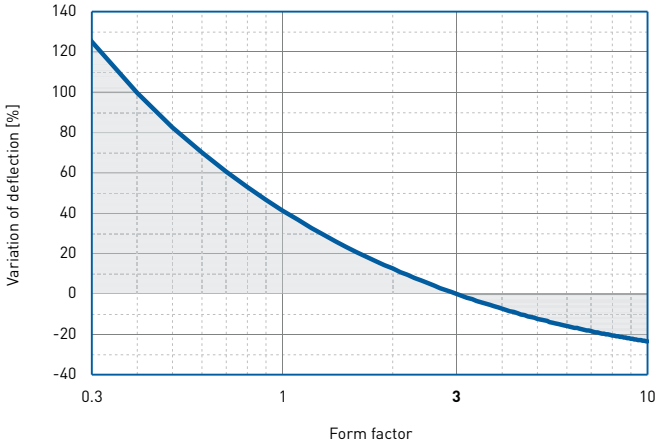
Correction values varying form factors

specific load 3.0 N/mm², form factor q = 3

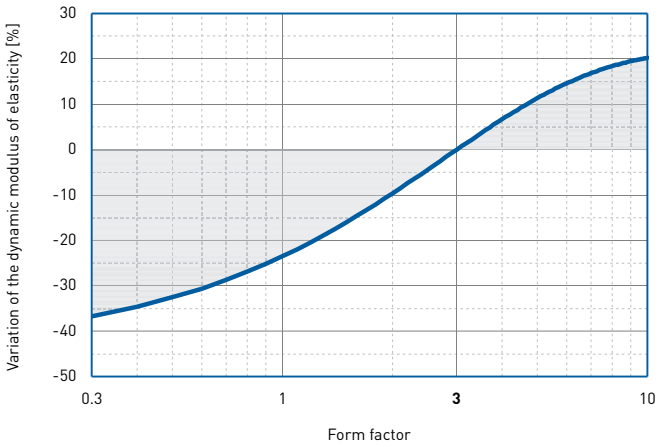
Static load range



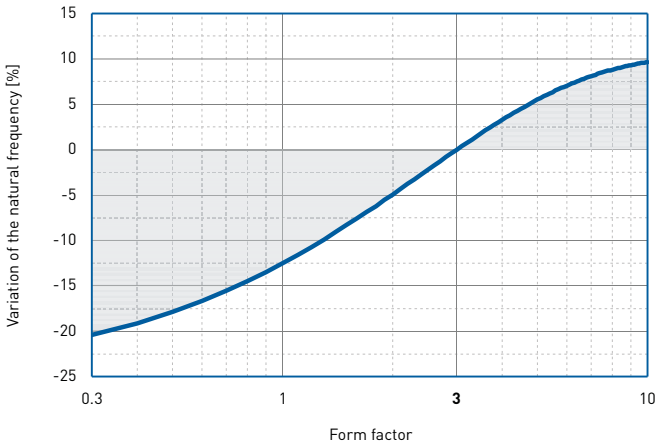
Deflection



Dynamic modulus of elasticity at 10 Hz



Natural frequency



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Product data sheet

HL 6000

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Recommendations for elastic bearing

Static load: up to [N/mm²]

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 q = 3

Material closed cellular polyether-urethane

Colour black grey

Delivery specifications

Thickness: 12.5 mm and 25 mm
Mats: 0.5 m wide, 2.0 m long
Stripes: max. 2.0 m long

Other dimensions on request (also stamping and moulded parts)

Properties	Value	Test method	Comment
Mechanical loss factor [1]	0.11	DIN 53513 [2]	guide value
Static E-modulus [1]	55 N/mm²	DIN 53513 [2]	
Dynamic E-modulus [1]	135 N/mm²	DIN 53513 [2]	
Static shear modulus [1]	3.5 N/mm²	DIN 53513 [2]	preload 6.0 N/mm²
Dynamic shear modulus [1]	6.0 N/mm²	DIN 53513 [2]	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

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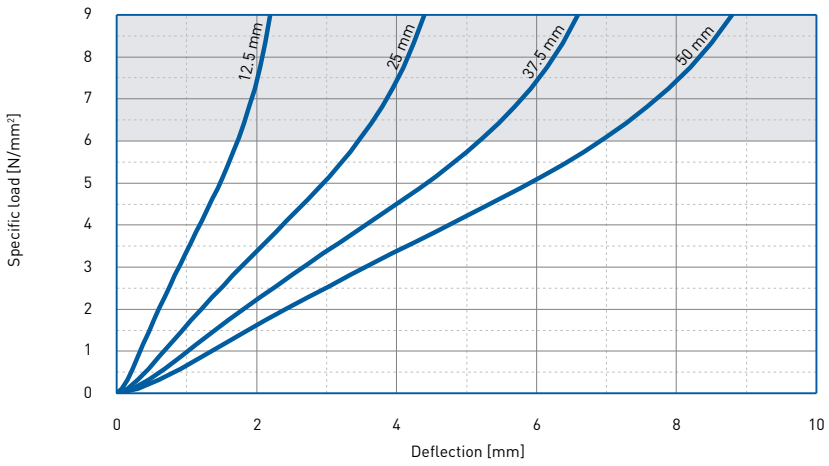
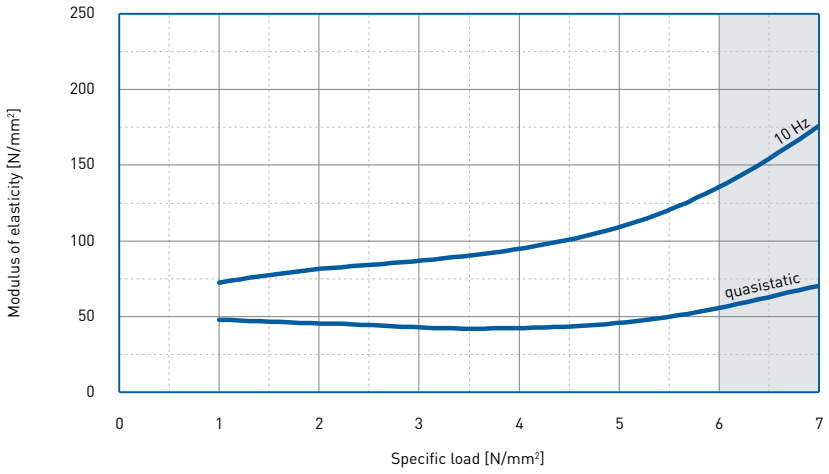
Load deflection curve



Recording of the 3rd loading; testing between steel plates with emery cloth of granulation K 120 at room temperature measured at v = 0.4 N/mm² / sec

Form factor q = 3

Modulus of elasticity

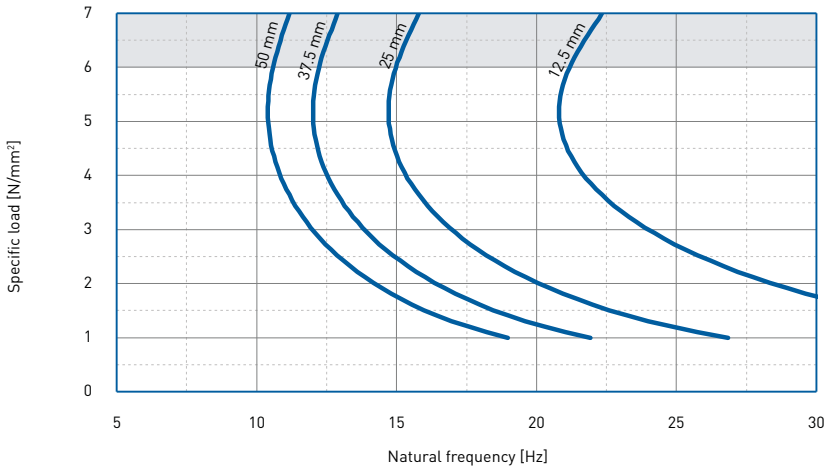


Dynamic test: sinusoidal excitation with an oscillating range of ± 0.11 mm at 10 Hz

Quasistatic modulus of elasticity: tangent modulus taken from the load deflection curve

Test according to DIN 53513
Form factor q = 3

Natural frequency



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Form factor q = 3

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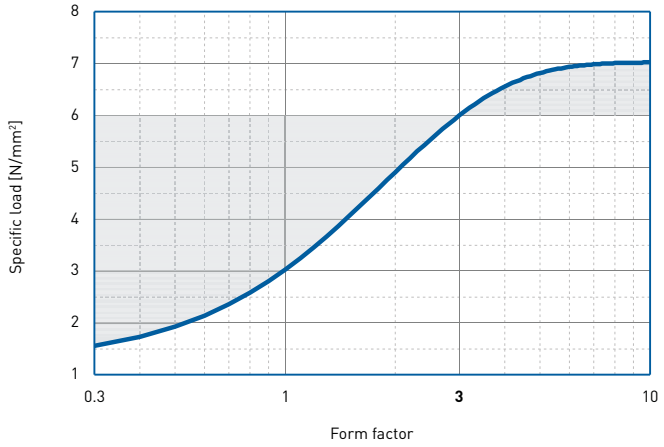
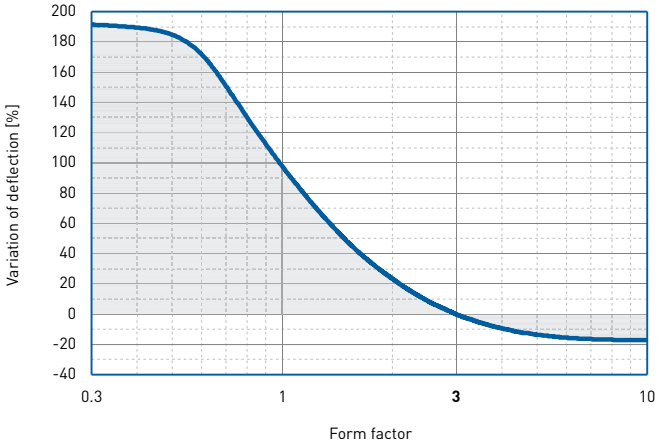
Correction values varying form factors

specific load 6.0 N/mm², form factor q = 3

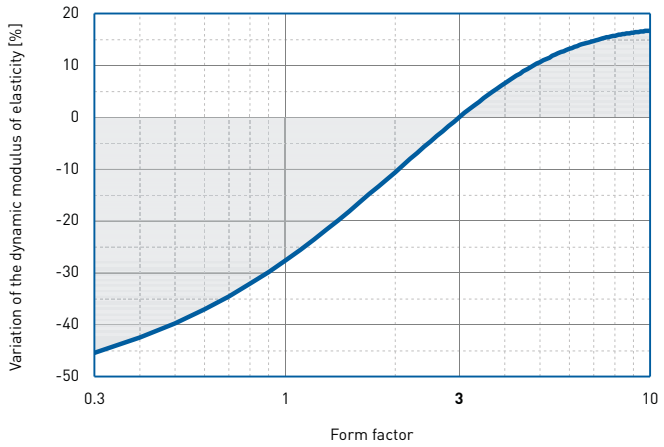
Static load range



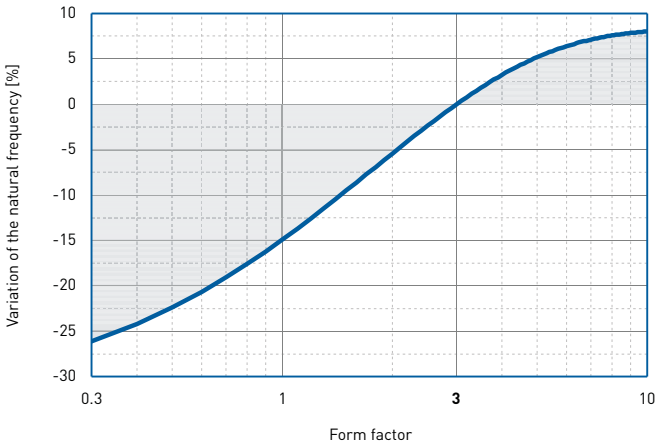
Deflection



Dynamic modulus of elasticity at 10 Hz



Natural frequency



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