NOVODAMP®

Closed-cell Polyurethane

Noise and vibration isolation

» Product description

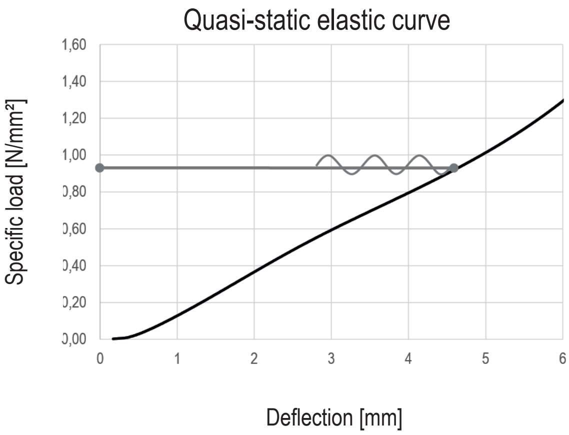
Vibration isolation solution

NOVODAMP® is the latest innovation in the elastic support of buildings for stiffness modification and vibration isolation. Since 1908, GERB is committed to vibration control, pioneering the use of elastic materials, including helical steel spring elements for thousands of projects around the world. GERB offers a variety of NOVODAMP® pads with different characteristics to provide track elasticity and vibration control for a broad range of applications.
GERB NOVODAMP® pads are held to stringent quality control standards to meet industry demands. The research and development team performs rigorous tests per international standards to ensure its characteristics do not vary over time. Project specific quality assurance (QA) programs can also be certified by independent institutes for further assurances.

When designing with NOVODAMP®, the application and the associated load cases must always be considered, particularly the load combinations expected for each application. In buildings, for example, the load is normally characterized by high permanent static loads and low dynamic amplitudes. In the case of rail tracks, the load is characterized by low static load with a high dynamic component.

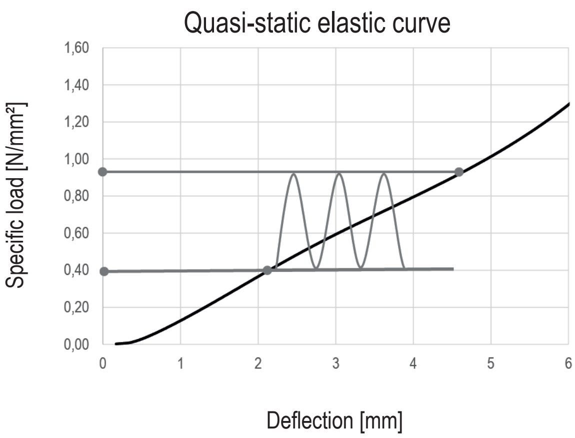
Vibration protection for buildings

All NOVODAMP® solutions are suitable for natural frequencies ≥ 8 Hz and up to a load-bearing capacity of 12 N/mm² (1740 PSI). Depending on shape factor, thickness and elasticity, the dynamic properties can be adapted to meet project demands.



Protection against noise and vibration with floating slab tracks (FST)

The elastic support systems from GERB significantly reduce the ground-borne transmission of noise and vibration generated by railways, regardless of whether they are used at the affected building or directly at the source of vibration. NOVODAMP® was developed for today's demanding rail applications worldwide. The material can be used as discrete pads, strip bearings or full-surface mats starting at a natural frequency of 8 Hz.



Material

GERB offers 15 standard closed-cell elastomer types. Their physical properties and performance characteristics have been developed by GERB to satisfy demanding application requirements. For special applications we also offer the implementation of bespoke solutions.

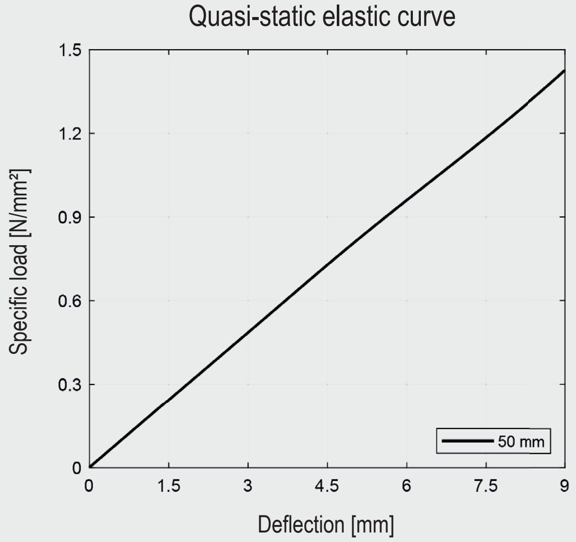
However, in all cases GERB NOVODAMP® materials offer:
// Low construction height
// Low dynamic stiffening
// High load capacity
// Low creep
// Excellent fatigue strength
// Low water absorption
// Resistance to aging
// Easy installation
// Low cost

Our engineers will select and dimension a solution suitable for every project. Furthermore, to ensure optimal installation and isolation efficiency, our scope of services includes installation procedures, an instruction program and onsite training. After receiving your request, we will also carry out a technical assessment that will lead to a project-specific solution. The following overview shows the various NOVODAMP® products and their associated areas of application and system frequencies. Detailed information is available upon request.

T006 T008 T010	≥ 10 Hz	Vibration isolation of rail tracks Under ballast mats (UBM) FST / Full-surface mats
T018 T025 T035 T045 T060 T075 T100 T125 T150	≥ 8 Hz	Vibration isolation of rail tracks FST / Discrete bearings Strips Stiffness transition zones
B300 B600 B1200		Vibration isolation of buildings

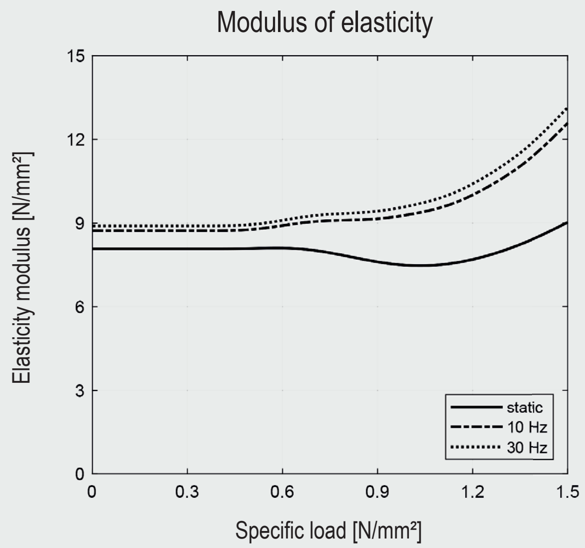
Static properties

NOVODAMP® pads show an almost linear load deflection curve up to the recommended maximum load. NOVODAMP® pads offer a partially progressive curve, exhibiting increasing stiffness characteristics. Different natural frequencies can be achieved from the behavior of the elastic material.



Dynamic properties

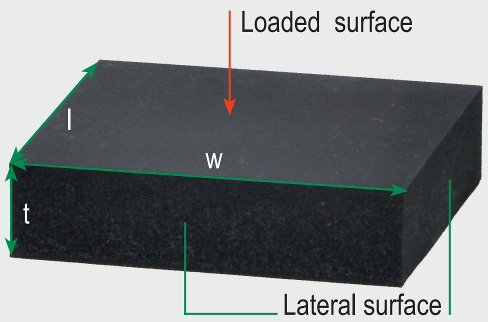
NOVODAMP® retains its performance characteristics even after long-term continuous load and intense dynamic load peaks:



Shape factor

Using the shape factor, the geometry of the NOVODAMP® bearing is taken into account in all strength and deformation calculations. The shape factor is defined as the ratio of the loaded surface to the freely deformable outer surface.

$$q = \frac{\text{Loaded surface}}{\text{Lateral surface}} = \frac{l \cdot w}{2 \cdot t \cdot (l + w)}$$



q = Shape factor

Natural frequency

The Natural Frequency in Hz assuming a single-mass oscillator can be calculated using the formula:

$$f_o = 15.76 \sqrt{\frac{E_{dyn}}{t \cdot \sigma}}$$

E_{dyn} = Dynamic youngs modulus [N/mm²]
t = Thickness of NOVODAMP® pad [mm]
σ = Pressure/load [N/mm²]

Loss factor

The loss factor results from the tangent of the phase angle between the time response of the fundamental harmonic component of force and deformation.
The damping is given by the mechanical loss factor. This value is normally between 0.07 and 0.13.

Nominal load

Permissible static load acting on the NOVODAMP® pads.

Static modulus of elasticity

Defines the relationship between tension and pressure when NOVODAMP® pads are deformed under static loads. This characteristic value is a specific static material property depending on the shape factor.

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Defines the relationship between tension and pressure when NOVODAMP® pads are deformed under dynamic loads. This characteristic value is a specific dynamic material property depending on the shape factor.

Static bedding modulus

Rigidity related to the area of the NOVODAMP® pads, taking static loads into account. This parameter is the specific static stiffness depending on the shape factor and based on the thickness of the material.

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Dynamic stiffening

Relationship between dynamic and static stiffness. The dynamic stiffening is usually between 1.3 and 1.6.

Deflection

Difference between the loaded and unloaded thickness of the NOVODAMP® pads.

Natural frequency

The Natural Frequency of a system supported with NOVODAMP® at a specific deflection, in Hz, assuming a single-mass oscillator.

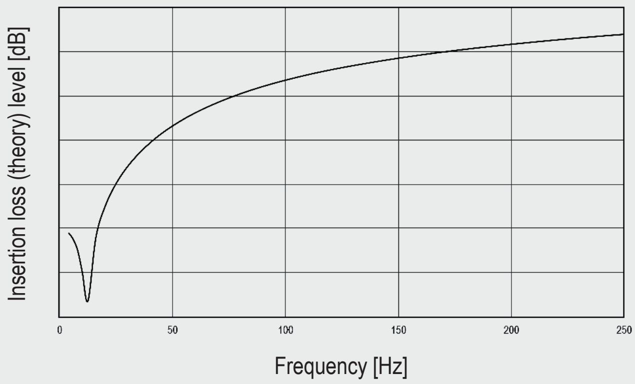
Capacity

The ratio between (design) load and permanent static payload in %.

Insertion loss

The natural frequency (f_r) and the damping (D) are necessary in order to predict the insertion loss of the system. The transfer function of a single-mass oscillator is considered as follows:

Theoretical isolation efficiency



Transmissibility

$$T = \sqrt{\frac{\left(1+4\cdot D^2\cdot\left(\frac{f}{fr}\right)\right)^2}{\left(1-\left(\frac{f}{fr}\right)^2\right)^2+4\cdot D^2\cdot\left(\frac{f}{fr}\right)^2}}$$

Particle velocity level

$L_v = 20 \cdot \log(T)$

Vibrations can be controlled – wherever they occur

Contact for GERB NOVODAMP®
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Vibration Control
Made in Germany. Since 1908. Worldwide.

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Interested in detailed information or individual consulting service?
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Certified: DIN EN ISO 9001 et al.

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