SYLODYN®

DETAILED DATA SHEET

Static creep behaviour

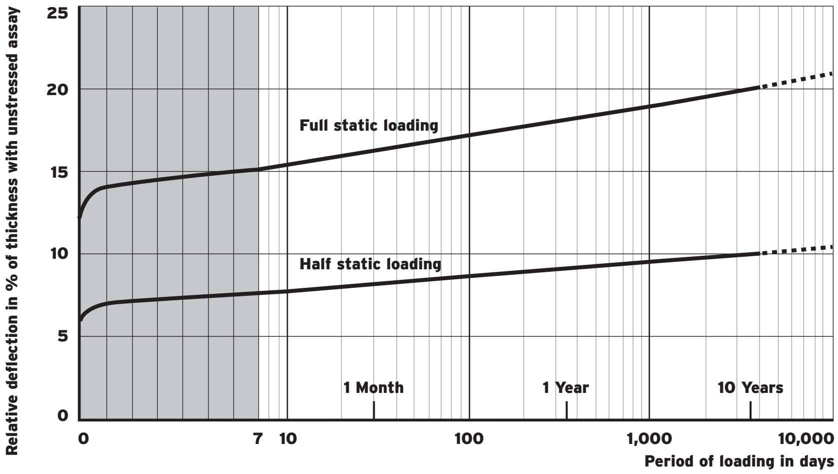

Fig. 1: Deformation under static load depending on time

Like other elastomers, Sylodyn® exhibits increased deformation under a static load (creeping). This increase in deformation is proportional to the time logarithm. In other words, the additional deformation that occurs is always the same for each decade (1 day, 10 days, 100 days, etc.). The largest increase in deformation due to creeping is completed after a relatively short period of time. The areas of application for Sylodyn® have therefore been selected so that the creep curve is the same for all types.

Dynamic creep behaviour

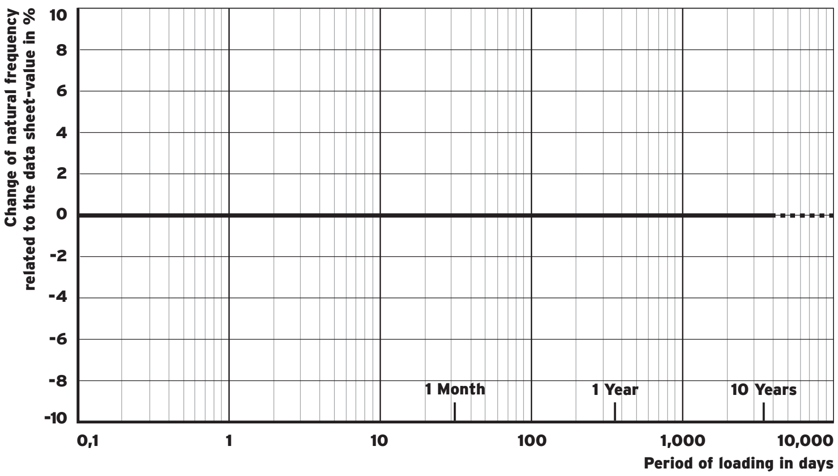

Fig. 2: Change of the natural frequency under static load depending on time

If Sylodyn® is used within the static range of use, the natural frequency remains stable under constant ambient conditions.

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Amplitude dependence

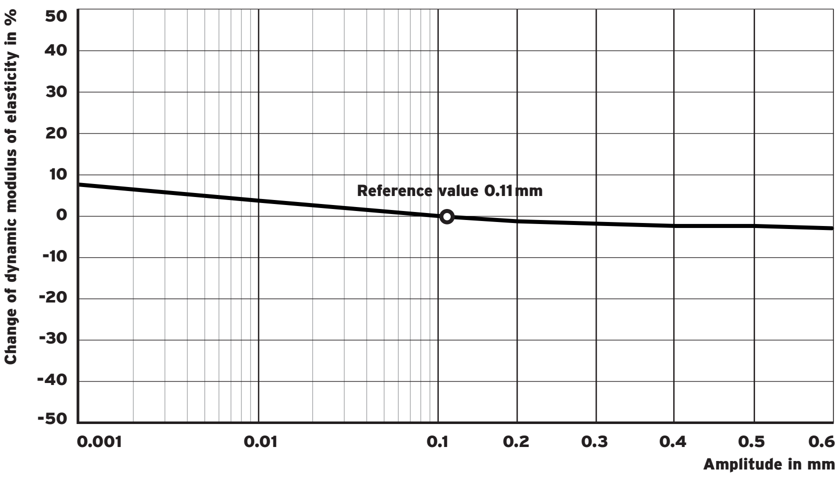


Fig. 3: Dynamic modulus of elasticity depending on the vibration amplitude

Sylodyn® materials exhibit a negligible dependency of amplitude. The dynamic stiffness of other elastic materials, such as compact, foamed or bonded (rubber granule) rubber products, however, is significantly dependent on the amplitude of excitation.

Reference value: amplitude 0.11 mm (corresponds to a velocitiy level of 100 dB_v at 10 Hz).

Dependency of the mechanical loss factor on temperature and excitation frequency

The mechanical loss factor of Sylodyn® is related to the temperature of the ambient and to the excitation frequency. These dependencies are shown in Tab. 1 and Tab. 2.

Dependency on temperature

	-10 °C	0 °C	10 °C	20 °C	30 °C	50 °C
Sylodyn® NB	0.35	0.20	0.11	0.07	0.06	0.05
Sylodyn® NC	0.35	0.20	0.11	0.07	0.06	0.05
Sylodyn® ND	0.35	0.20	0.11	0.08	0.06	0.05
Sylodyn® NE	0.36	0.20	0.12	0.08	0.07	0.05
Sylodyn® NF	0.37	0.22	0.13	0.09	0.07	0.05

Dependency on frequency

	1 Hz	50 Hz	100 Hz	1,000 Hz
Sylodyn® NB	0.05	0.12	0.17	0.36
Sylodyn® NC	0.05	0.12	0.16	0.33
Sylodyn® ND	0.05	0.12	0.15	0.30
Sylodyn® NE	0.06	0.12	0.15	0.27
Sylodyn® NF	0.07	0.12	0.15	0.24

Tab. 1 and Tab. 2: DMA-test (Dynamic Mechanical Analysis). Test within linear area of the load deflection curve. Values based on the shape factor 3 shown at the static range of use.

Temperature dependency of the dynamic modulus of elasticity

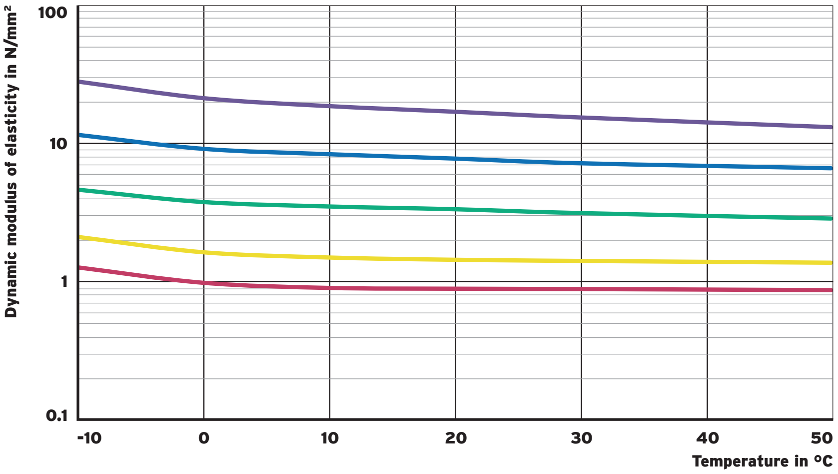


Fig. 4: Dynamic modulus of elasticity depending on the temperature

Sylodyn® exhibits a temperature dependence of the dynamic modulus of elasticity.

DMA-test (Dynamic Mechanical Analysis), measurements with sinusoidal excitation in the linear area of the load deflection curve, values based on the shape factor 3 shown at the static range of use at a frequency of 10 Hz.

- **Sylodyn® NF**
- **Sylodyn® NE**
- **Sylodyn® ND**
- **Sylodyn® NC**
- **Sylodyn® NB**

Frequency dependency of the dynamic modulus of elasticity

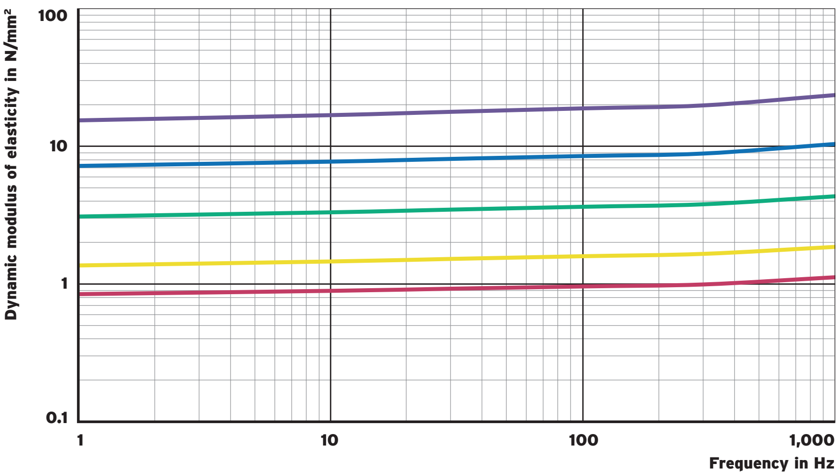


Fig. 5: Dynamic modulus of elasticity depending on the frequency

Sylodyn® exhibits a frequency dependence of the dynamic modulus of elasticity.

DMA-test (Dynamic Mechanical Analysis), measurements at room temperature (23 °C) with a sinusoidal excitation in the linear area of the load deflection curve, values based on the shape factor 3 shown at the static range of use.

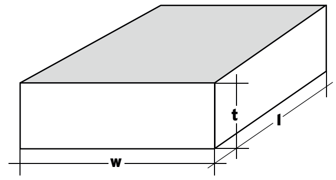
- **Sylodyn® NF**
- **Sylodyn® NE**
- **Sylodyn® ND**
- **Sylodyn® NC**
- **Sylodyn® NB**

Shape factor

The shape factor (q) is a geometric measure for the shape of an elastic bearing defined as the ratio of the loaded area and the area of the perimeter surfaces.

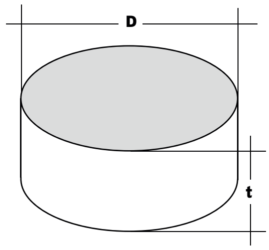
Definition: $\text{Shape factor} = \dfrac{\text{Loaded area}}{\text{Perimeter surface area}}$

The charts shown in the data sheets for the load deflection curve, for the modulus of elasticity and for the natural frequency are suitable for shape factor 3. The material properties must be adapted accordingly for different shape factors, shown on page 4 of the data sheet.



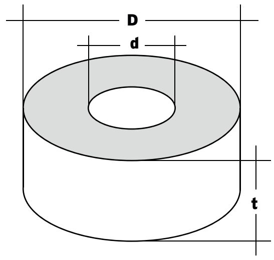
Cuboid

$$q = \frac{w \cdot l}{2 \cdot t\,(w + l)}$$



Cylinder

$$q = \frac{D}{4 \cdot t}$$



Hollow cylinder

$$q = \frac{D - d}{4 \cdot t}$$

Elastic Sylodyn® bearings are considered as

Celled materials with low densities such as Sylodyn® NB are volume compressible and hence the influence of the shape factor on stiffness can be neglected. By contrast, the shape factor plays an increasingly important role as the compactness of the elastomer increases.

All information and data is based on our current knowledge. The data can be applied for calculations and as guidelines, are subject to typical manufacturing tolerances and are not guaranteed. Material properties as well as their tolerances can vary depending on type of application or use and are available from Getzner on request.