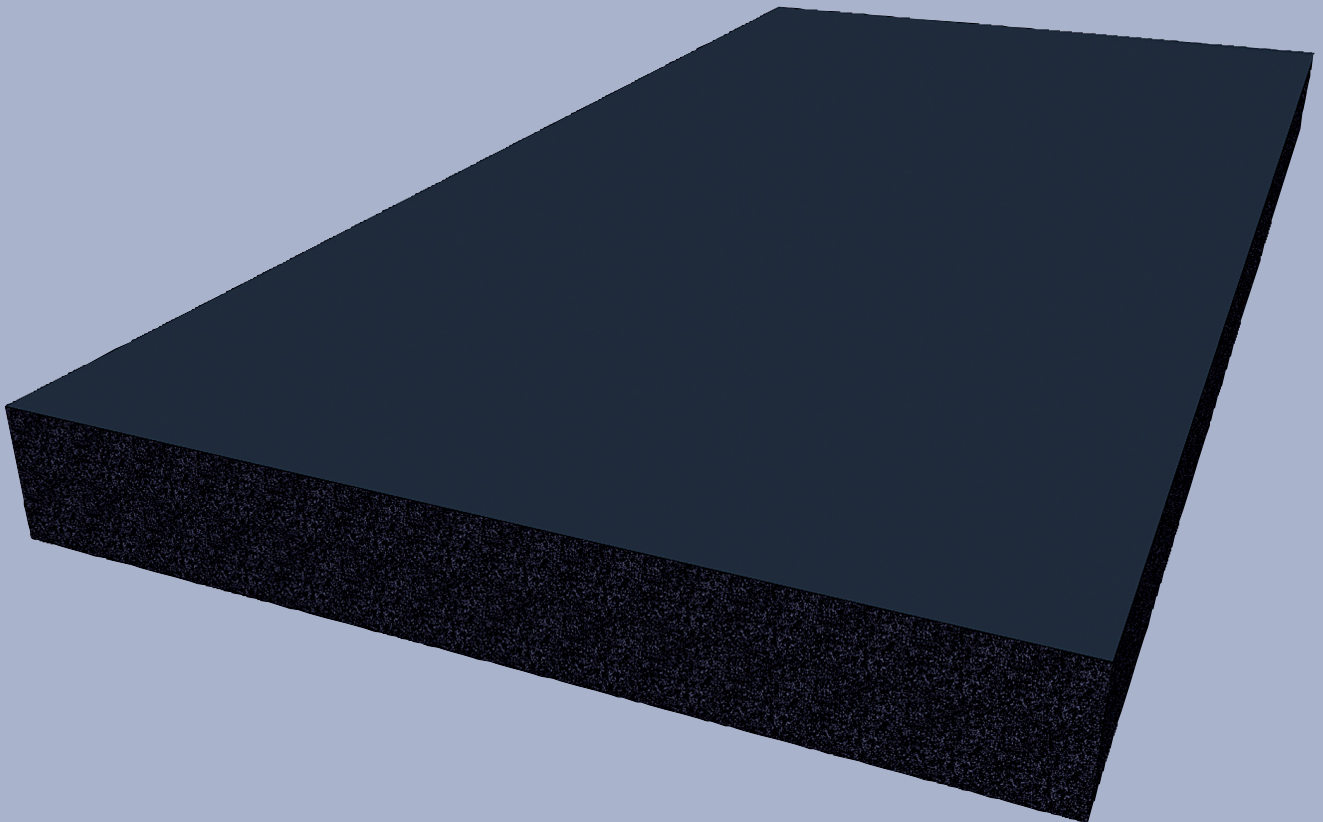


# CISADOR



*Vibration isolation and structure-borne noise insulation  
for machines, buildings et.al. supported on strips*

# Natural Frequency

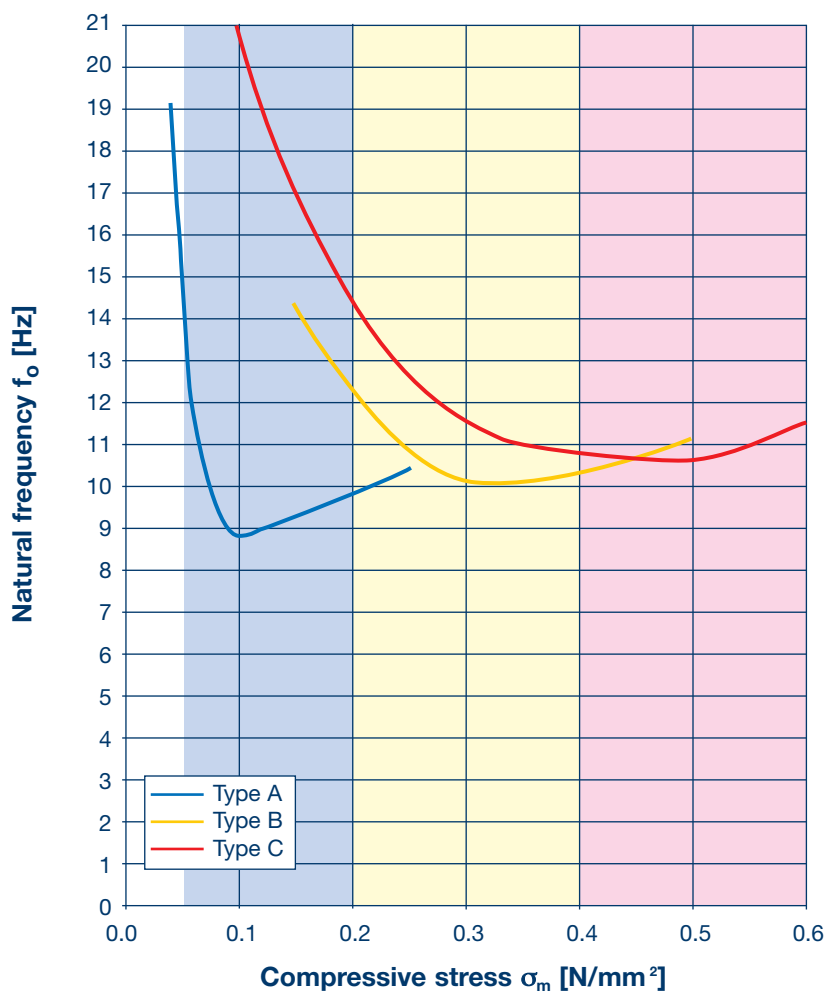
## Contents

	Page
Product Description	2
Natural Frequency	2
Degree of Damping	3
Field of Application	4
Isolation Efficiency	4
Dimensions	5
Damping Effect	5
Text of Tender Document	5
Dynamic Foundation Modulus	6
Installation Details	6
Static Deflection	7
Design Example	7
Test Certificate	8

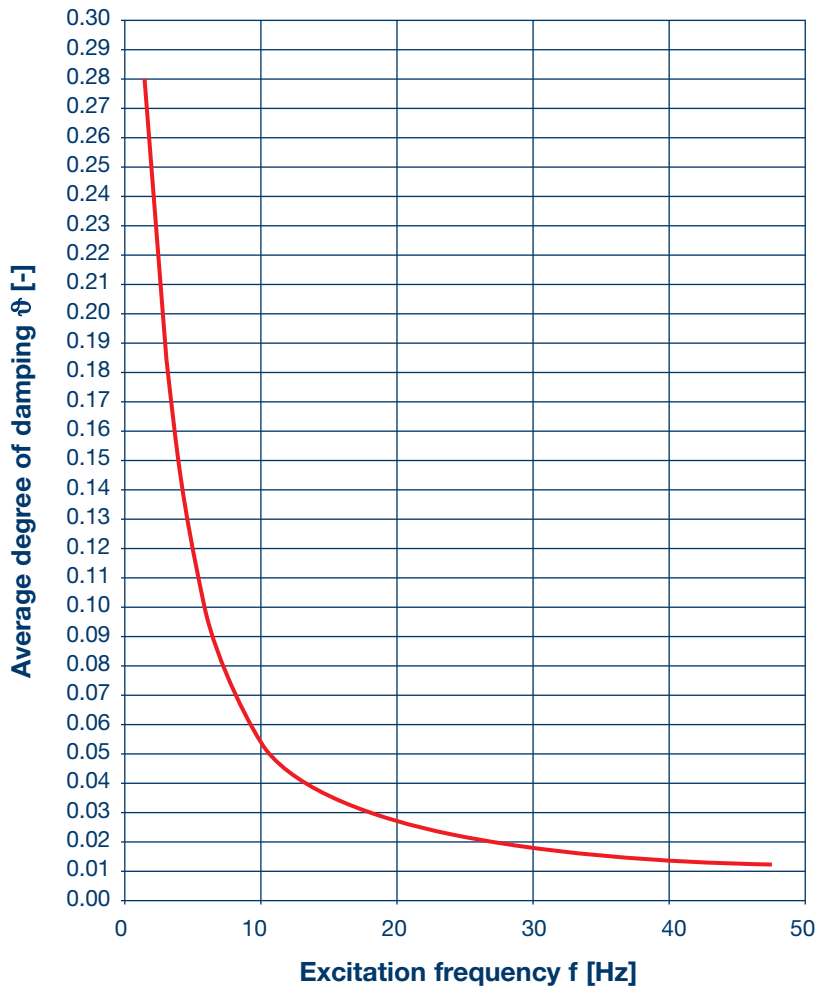
## Product Description

Cisador is used for vibration isolation of buildings and machines. It consists of closed cell EPDM material and is generally laid in two layers of 15 mm thickness each. There are 3 types of Cisador: Types A, B and C which are applied at different compressive stress ranges (see table on page 5). In difference to type B and C the lower layer of type A is perforated.

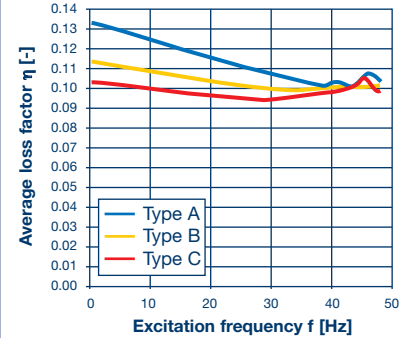
- = optimum range of compressive stress of type A
- = optimum range of compressive stress of type B
- = optimum range of compressive stress of type C



Vibration velocity 1 mm/s



Vibration velocity 1 mm/s



## Degree of Damping

The damping ratio  $\vartheta$  (often given as percentage) is a measure of how rapidly free oscillations die down.

In general: An increase in  $\vartheta$ , leads to lower resonance amplifications  $\ddot{U}_{\max}$ . The damping effect sets in at a frequency ratio of  $f/f_0 > 1.4$ .

# Degree of Damping

# Isolation Efficiency

## Field of Application

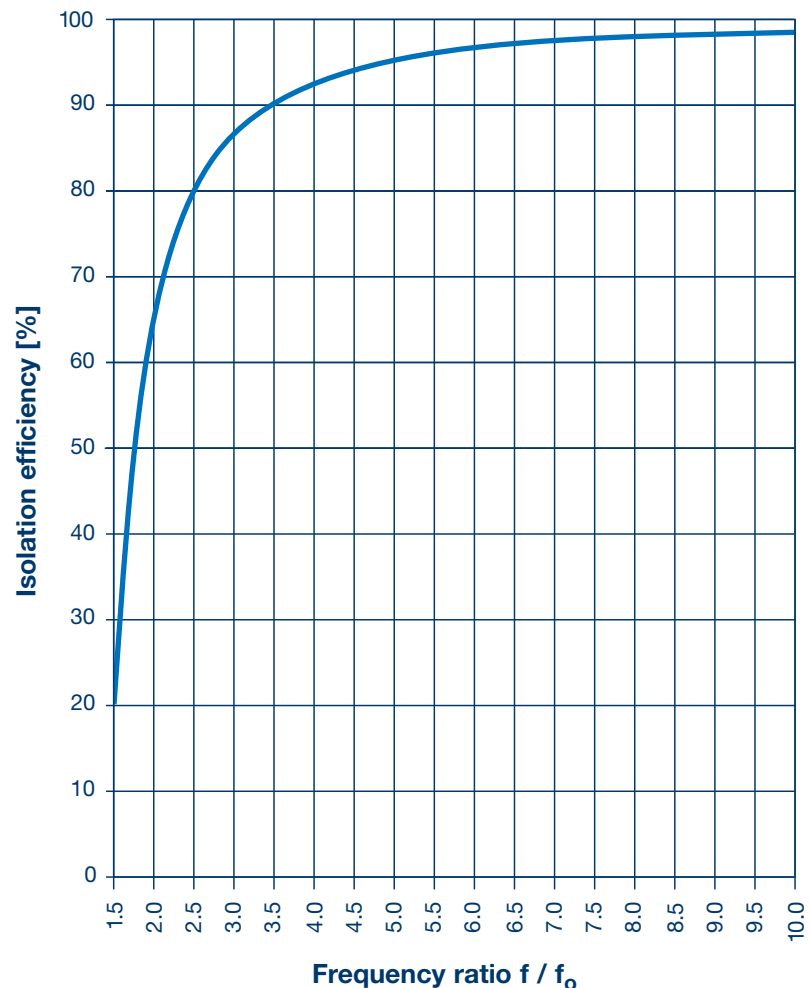
**Compressive stress: 0.05 – 0.60 N/mm<sup>2</sup>**

Cisador is used as an elastic component so as to reduce the forces which act on bearings or foundation. That way the transmission of vibration or structure-borne noise is reduced. Depending on the compressive stress and area considered three different types of Cisador can be chosen from and it can be installed over a larger area as well as in strip form. The material is closed cell and does not absorb water. It can also be used in areas where surface water may occur.

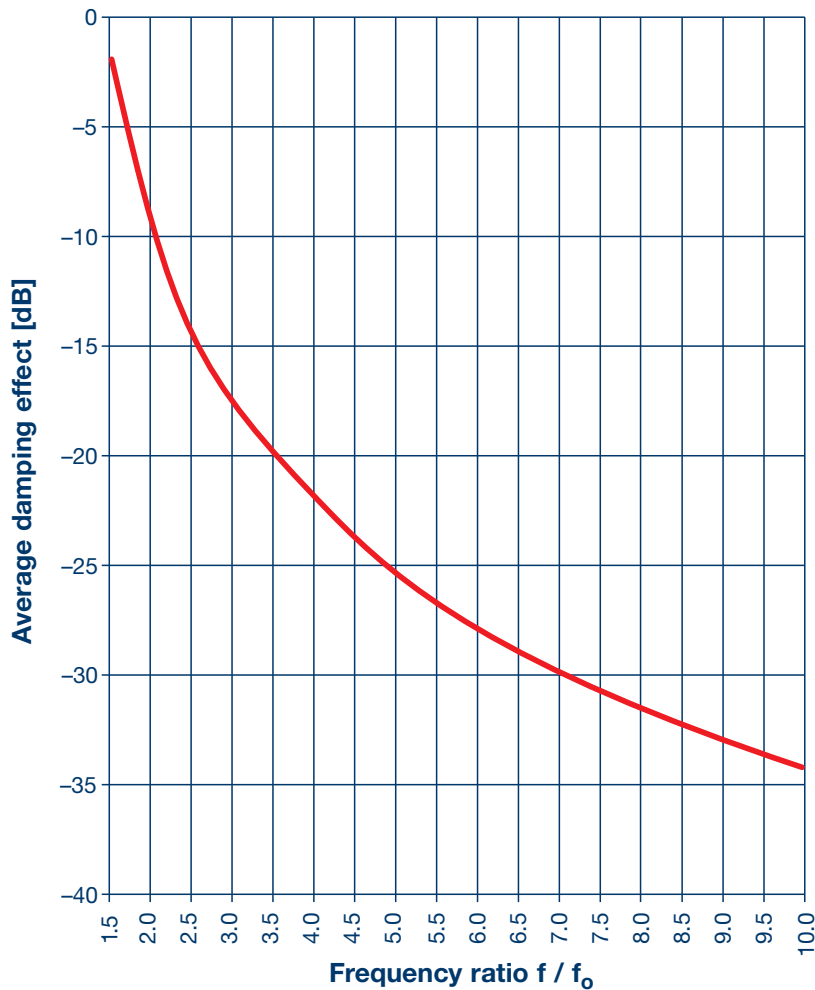
For all applications a minimum distance of 30 mm has to be observed to the outer edges of the structural elements.

### Note:

The tests were carried out at vibration velocities of 1 mm/s and 2 mm/s. However, for 2 mm/s the results deviate on average by a maximum of 10 % from the values shown.



*Vibration velocity 1 mm/s*



Vibration velocity 1 mm/s

Designation	Compressive stress range [N/mm <sup>2</sup> ]	Thickness [mm]
Type A	0.05 – 0.20	2 x 15 *
Type B	0.20 – 0.40	2 x 15
Type C	0.40 – 0.60	2 x 15

\* lower layer perforated

### Text of Tender Document

Calenberg Cisador, 30 mm thick, closed cell, water repellent EPDM material, deliver and install according to manufacturer's installation instructions.

Type .....  
 Quantity: ..... m<sup>2</sup>  
 Length: ..... mm  
 Width: ..... mm  
 Price: ..... €/m<sup>2</sup>

Supplier:  
 Calenberg Ingenieure GmbH  
 Am Knübel 2-4  
 D-31020 Salzhemmendorf/Germany  
 Phone +49 (0) 51 53 / 94 00-0  
 Fax +49 (0) 51 53 / 94 00-49

# Damping Effect

# Dynamic Foundation Modulus

## Installation Details

Cisador may be laid loosely over a large area on a foundation having adequate load bearing capacity or in strips on smooth screeded brick walls.

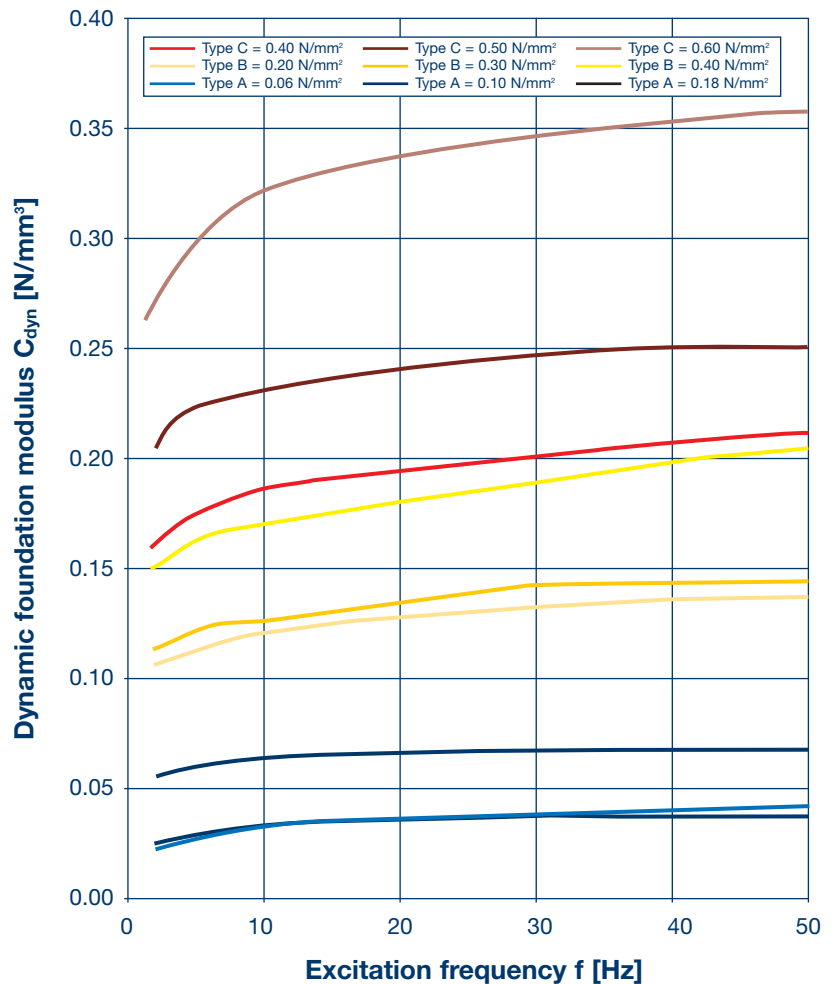
### Large area application:

If the Cisador mat is placed underneath cast in-situ concrete, it shall be covered with standard PE foil.

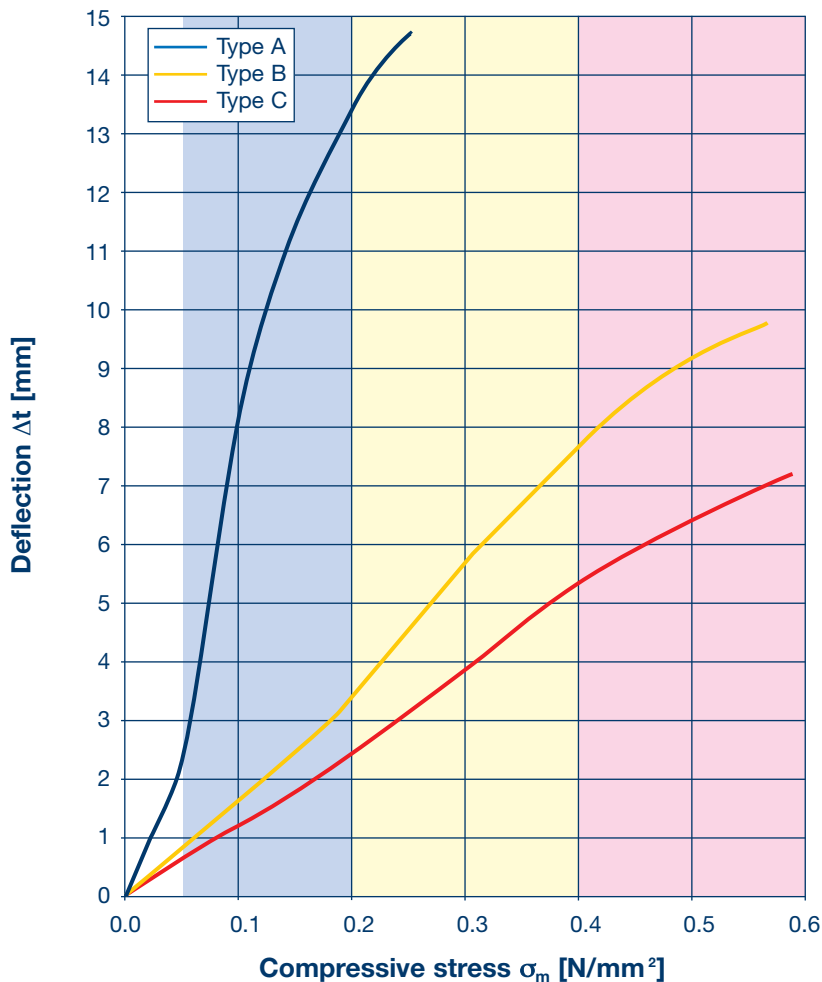
### Strip type application:

If Cisador is laid on brick walls a firm cover needs to be applied over the total width of the wall; this may be a plastic sheet (e.g. Calenberg GRP-sheets,  $t = 5 \text{ mm}$ ).

The unrestrained deformation of the bearing has to be guaranteed at all times so as to avoid transmission of structure-borne noise.



Amplitude of vibration velocity 1 mm/s



## Design Example for a Building

### Objective:

- Vibration and structure-borne noise protection of a building situated near a railway line.
- Provision of an elastic joint between cellar walls and ceiling, interior walls 175 mm wide, existing vertical load 60 kN/m
- Excitation frequency of rail traffic 40 Hz

For design purpose a single degree of freedom system is used as equivalent system having one translatory movement.

For small support widths and vertical loads, deducting the minimum edge distances of 30 mm to the construction member edges, the resulting elastomeric strip width is 115 mm.

**Selected:** CISADOR TYP C,  
115 mm wide, 30 mm thick

### Given values:

- Compressive stress 0.52 N/mm²
- Natural frequency 10.7 Hz
- Deflection 6.6 mm
- Dyn. foundation modulus 0.25 N/mm³
- Av. degree of damping 0.015
- Loss factor 0.095
- Frequency ratio  $f/f_0$  3.73
- Damping effect 21 dB
- Isolation effect 91 %

# Static Deflection

# Test Certificate

“Determining the static and dynamic material behaviour of Cisador elastic bearings”

Research Report 30/08

Technical University of Dresden, 2008



Figure 1: Covered support joint e.g. to support the filigree slab panels



Figure 2: Stripped and finished horizontal joint

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