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**Sound deadening compound  
PYRO-SAFE DG-SKN  
of the company svt Brandschutz  
Vertriebsgesellschaft mbH**

**Determination of the loss factor  
according to EN ISO 6721-3**

**Test Report No. M124497/01**

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## 1 Task

On behalf of the company svt Brandschutz Vertriebsgesellschaft mbH, Germany, the damping loss factor of the sound deadening compound PYRO-SAFE DG-SKN applied on steel beams was to be determined.

The determination of the loss factor was made according to the resonance curve method of EN ISO 6721-3 [2].

## 2 Basics

This test report is based on the following documents:

- [1] DIN EN ISO 6721-1: 2003-01  
Plastics - Determination of dynamic mechanical properties - Part 1: General principles (ISO 6721-1:2001); German version EN ISO 6721-1:2002
- [2] DIN EN ISO 6721-3: 1996-12  
Plastics - Determination of dynamic mechanical properties - Part 3: Flexural vibration; resonance-curve (ISO 6721-3:1994, including Technical Corrigendum 1:1995); German version EN ISO 6721-3:1996

## 3 Test objects

The coverings were applied holohedral to the steel beams. One end of the beams was not covered to put it into the measuring device. In Table 1 the dimensions and masses of the beams and coverings are shown.

Table 1. Details of the covered steel beams.

no.	length of beam [mm]	length of covering [mm]	width of beam [mm]	mass of system [g]	length specific mass of system [g/m]	thickness of system with standard deviation [mm]	area specific mass of covering [kg/m <sup>2</sup> ]
1	220	200	10	19.2	88.4	1.8 ± 0.1	1.0
2				19.0	87.0	1.7 ± 0.1	0.9
3				20.6	95.0	2.3 ± 0.1	1.7
4				20.8	96.2	2.4 ± 0.1	1.8
5				21.9	101.7	2.7 ± 0.1	2.4

#### 4 Test procedure and test conditions

The flexural loss factor  $\tan \delta_f (= \eta)$  was determined according to the resonance curve method. The beams were clamped in the test device (method A).

The determination of the loss factor was made from the resonance curves in system modes 3 and 4.

Measurements were made from temperature  $\vartheta = -20^\circ\text{C}$  to  $+50^\circ\text{C}$  in steps of  $\Delta\vartheta = 10^\circ\text{C}$ .

Table 2. Test equipment.

Name	Manufacturer	Type	Serial-No.
AD/DA-Wandler	RME	Fireface 400	22574100
Amplifier	Sonus	Modul-150	04070527
Laser-Vibrometer	Polytec	PDV-100	100664
Magnetic transducer	B&K	MM0002	--

#### 5 Test results

The test results are stated in Figures 1 to 5. The flexural loss factors of the system (steel beam and covering) are indicated. It has to be noticed that the upper measurement limit for the loss factor of  $\eta \leq 0.1$ , which is stated in [2], is exceeded substantially for sample No. 5. The affected values are marked with dashed lines.

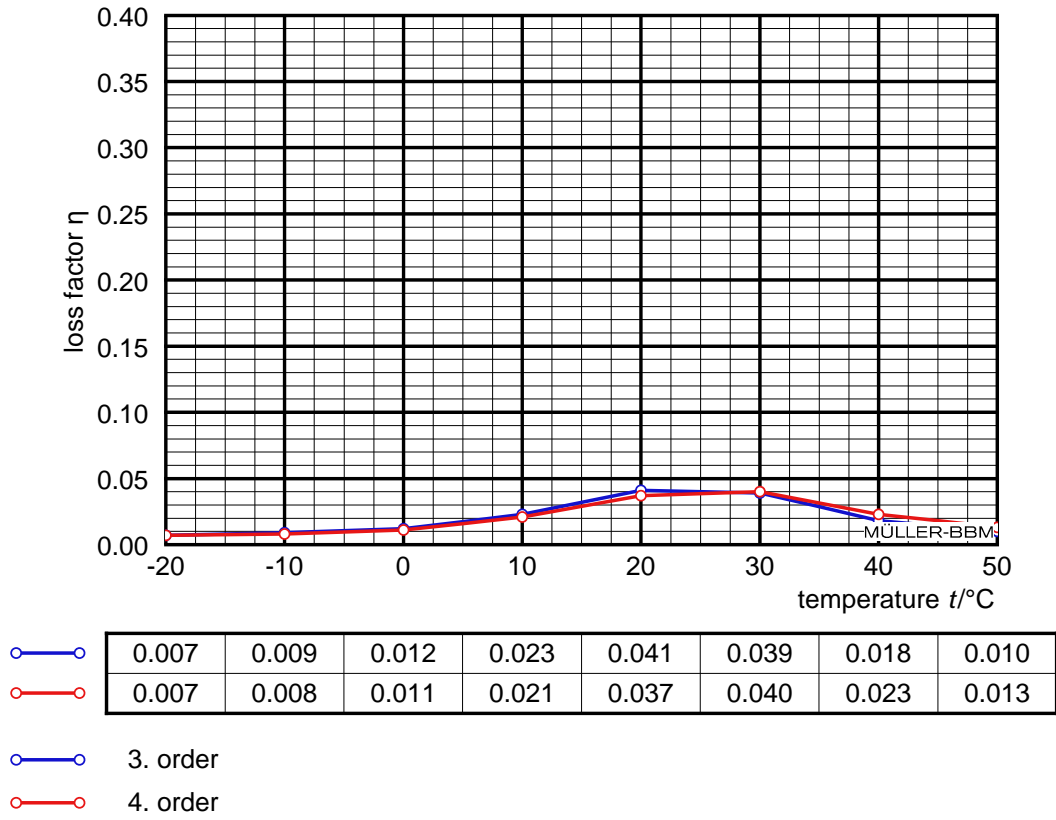


Figure 1. Loss factor of sample No. 1.

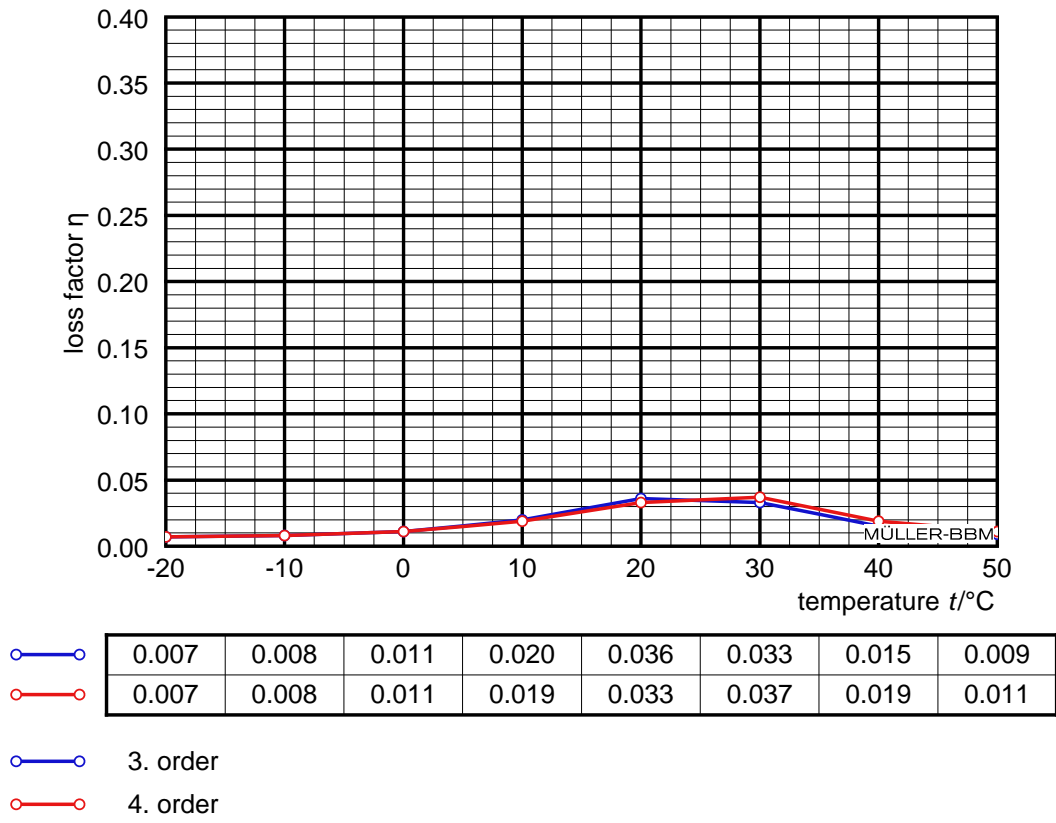
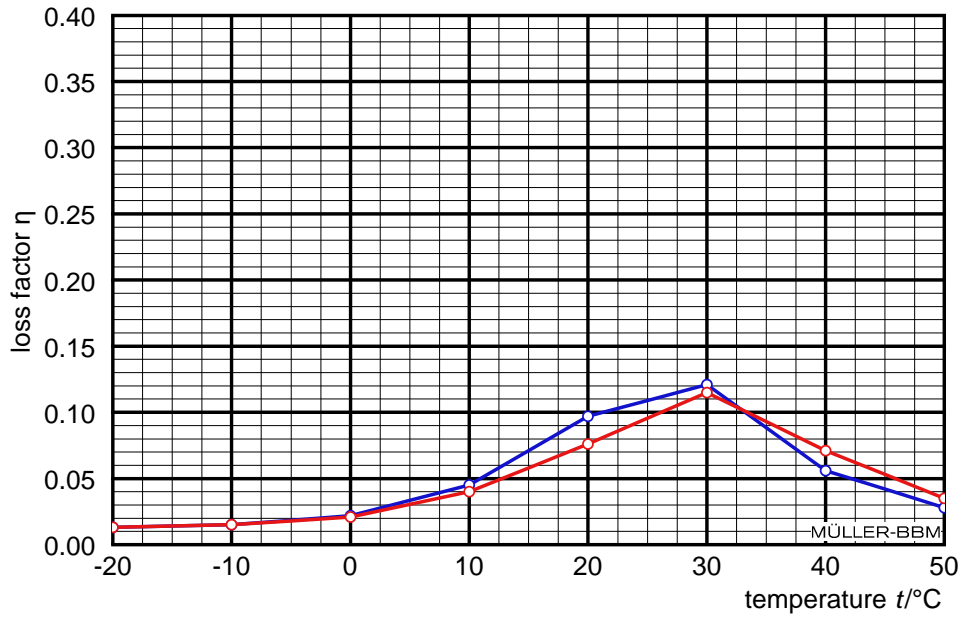


Figure 2. Loss factor of sample No. 2.

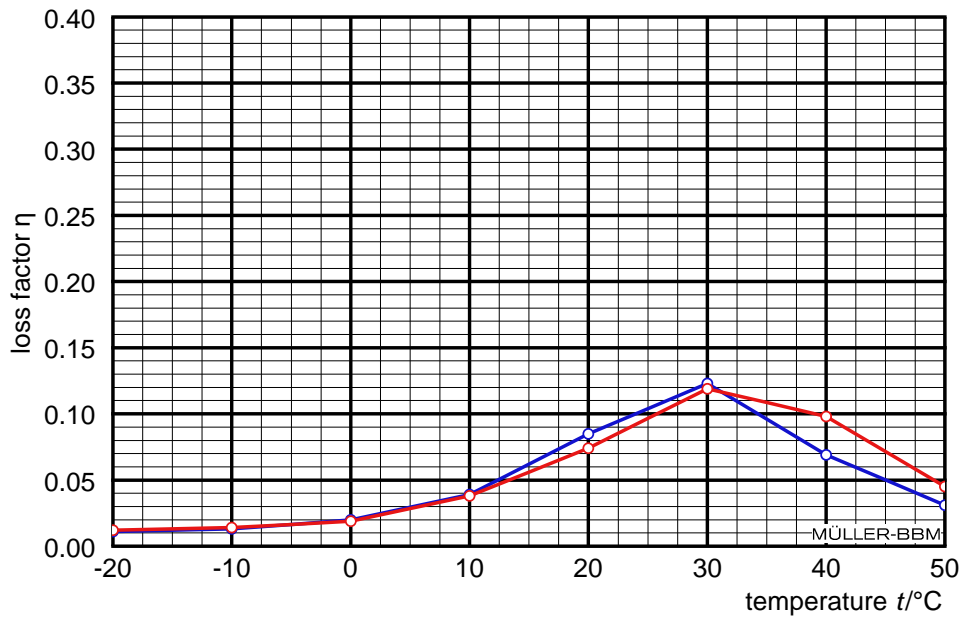
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○—○	0.013	0.015	0.022	0.045	0.097	0.121	0.056	0.028
○—○	0.013	0.015	0.021	0.040	0.076	0.115	0.071	0.035

- 3. order
- 4. order

Figure 3. Loss factor of sample No. 3.



○—○	0.011	0.013	0.020	0.039	0.085	0.123	0.069	0.031
○—○	0.012	0.014	0.019	0.038	0.074	0.119	0.098	0.045

- 3. order
- 4. order

Figure 4. Loss factor of sample No. 4.

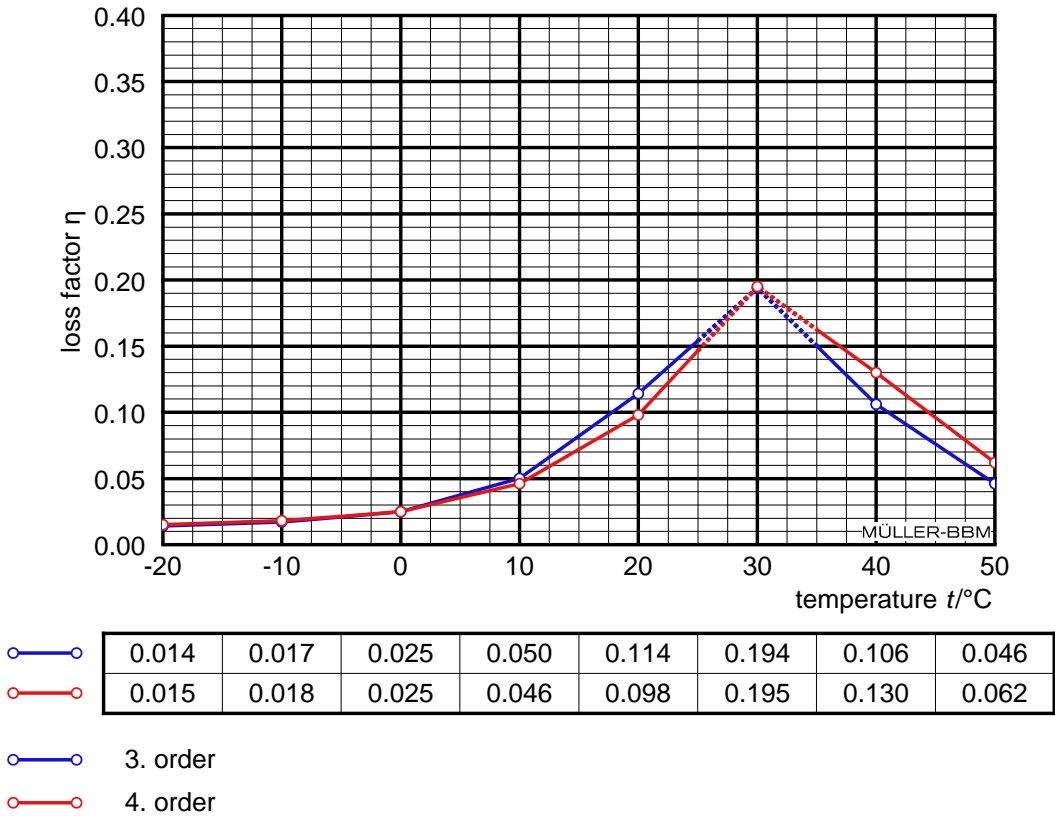
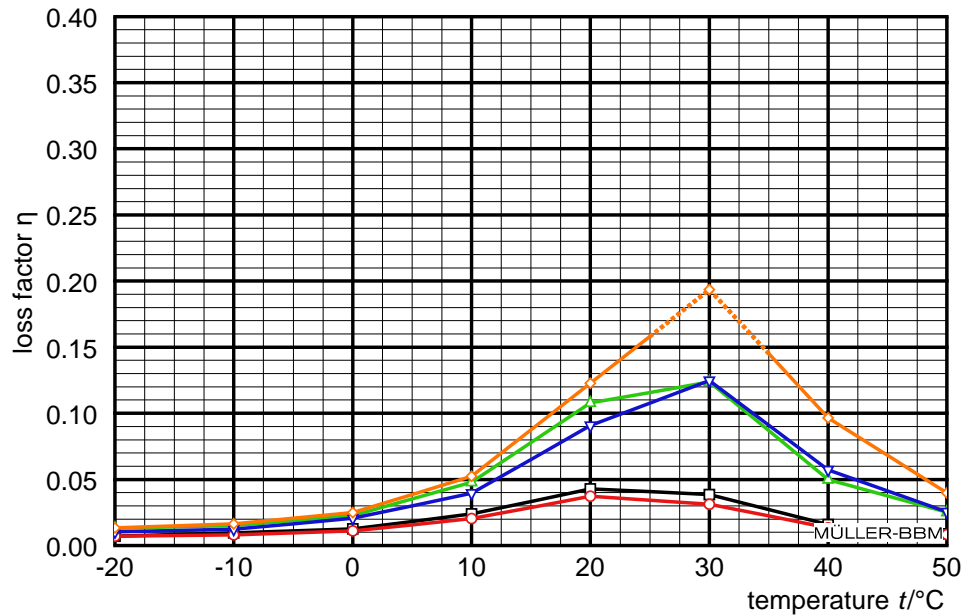


Figure 5. Loss factor of sample No. 5.

### 6 Loss factor at 200 Hz

Additionally to the loss factor depending on the order number the loss factor at 200 Hz is stated. The loss factor at 200 Hz is interpolated, if necessary extrapolated from the measured values.



□	0.007	0.009	0.013	0.024	0.043	0.039	0.016	0.009
○	0.007	0.008	0.011	0.021	0.037	0.031	0.013	0.008
△	0.013	0.015	0.023	0.048	0.108	0.124	0.050	0.025
▽	0.010	0.012	0.021	0.040	0.091	0.125	0.057	0.025
◇	0.013	0.016	0.025	0.052	0.123	0.194	0.097	0.040

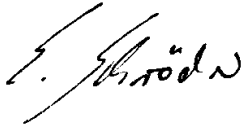
- No. 1
- No. 2
- △ No. 3
- ▽ No. 4
- ◇ No. 5

Figure 6. Loss factor of samples No. 1 to 5 at 200 Hz.



## 7 Remarks

The results exclusively refer to the tested objects. This test report may only be published and copied as a whole including all of its appendixes. The publishing of extracts requires the prior written consent of Müller-BBM GmbH.



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