

**Test certificate**

**for the determination of the structure-borne sound insulation of elastic mounting elements according to the dual resonator method by means of the methods stated in DIN EN ISO 10846-4**

**Type of the test:** Measurement of vibration transmission factors in the form of velocity level differences of elastic mounting elements

**Client:** Hilti Aktiengesellschaft  
Feldkircherstrasse 100  
9494 Schaan Liechtenstein

**Date of the test:** 2007-10-17 and -18      **Test report No.** M68 276/9 of 2007-11-30

**Test object:**

Name:	Ventilation angle	Manufacturer:	Hilti
Type:	MVA-LC 60	Year of construction:	2007
Product No.:	39873	State:	new

**Technical data:**

Side length:	60 mm	Material:	DC01/DD11
Width:	30 mm	Elastic element:	EPDM 55± 5 Shore A
Height:	1.5 mm	Fixing holes:	6

**Test method: Dual resonator method by means of the methods stated in DIN EN ISO 10846-4**

"Laboratory measurement of the vibro-acoustic transfer properties of resilient elements", February 2004  
Fixing and coupling of accelerometers according to DIN ISO 5348 "Mechanical mounting of accelerometers".

Vibration excitation signal: sine sweep signal  
Frequency range: 20 Hz up to 2000 Hz

**Calibration:** According to DIN EN ISO 16063-21 within the scope of Müller-BBM's quality management system

**Environmental conditions:** Temperature: 21°C, relative humidity: 60 %

**Test set-up:**

Test object: Installation according to practical use, fixing at exciting mass and isolating mass so that a good contact is guaranteed. Coupling of the vibration exciter via a tappet.

Vibration-exciting equipment:	Brüel & Kjaer 4801	Exciting mass:	30 kg + adapter mass
Vibration initiation:	axial	Isolating mass:	30 kg

Static preload:

Fastened with threaded rods 90 N up to 410 N. Fastened directly to the ceilings 90 N up to 320 N

**Test results:** Ventilation angle MVA-LC 60

- The effectiveness of structure-borne sound insulation starts at: **Fastened with threaded rods:** ventilation angle "without" elastic element: 80 Hz, „with“ elastic element: 31 Hz; **Fastened directly to the ceilings:** ventilation angle "without" elastic element: 100 Hz, with" elastic element: 50 Hz
- Compared with the ventilation angle MVA-LC 60 „without“ elastic element, by the ventilation angle MVA-LC 60 „with“ elastic element an improvement is achieved, which is between 5 up to 100 dB **fastened with threaded rods** and between 14 up to 20 dB **fastened directly to the ceilings**.
- For an increase of the static preload up to 410 N or up to 320 N, the structure-borne sound insulating effect of the ventilation angle MVA-LC 60 decreases by 1 up to 6 dB **fastened with threaded rods** and by 3 up to 6 dB **fastened directly to the ceilings**.
- For the ventilation angles MVA-LC 100 and MVA-ZC a similar effect with regard to structure-borne sound can be expected like for the tested ventilation angle MVA-LC 60.
- If the ventilation angle MVA-LC 60 „with“ elastic element is used in a professional way, an improvement of structure-borne sound insulation as defined in DIN 4109, „Sound insulation in buildings“ of November 1989 can be achieved.

**Place and date:** Planegg near Munich, 2007-11-30

**Test carried out by:** Dr. M. Schmidt

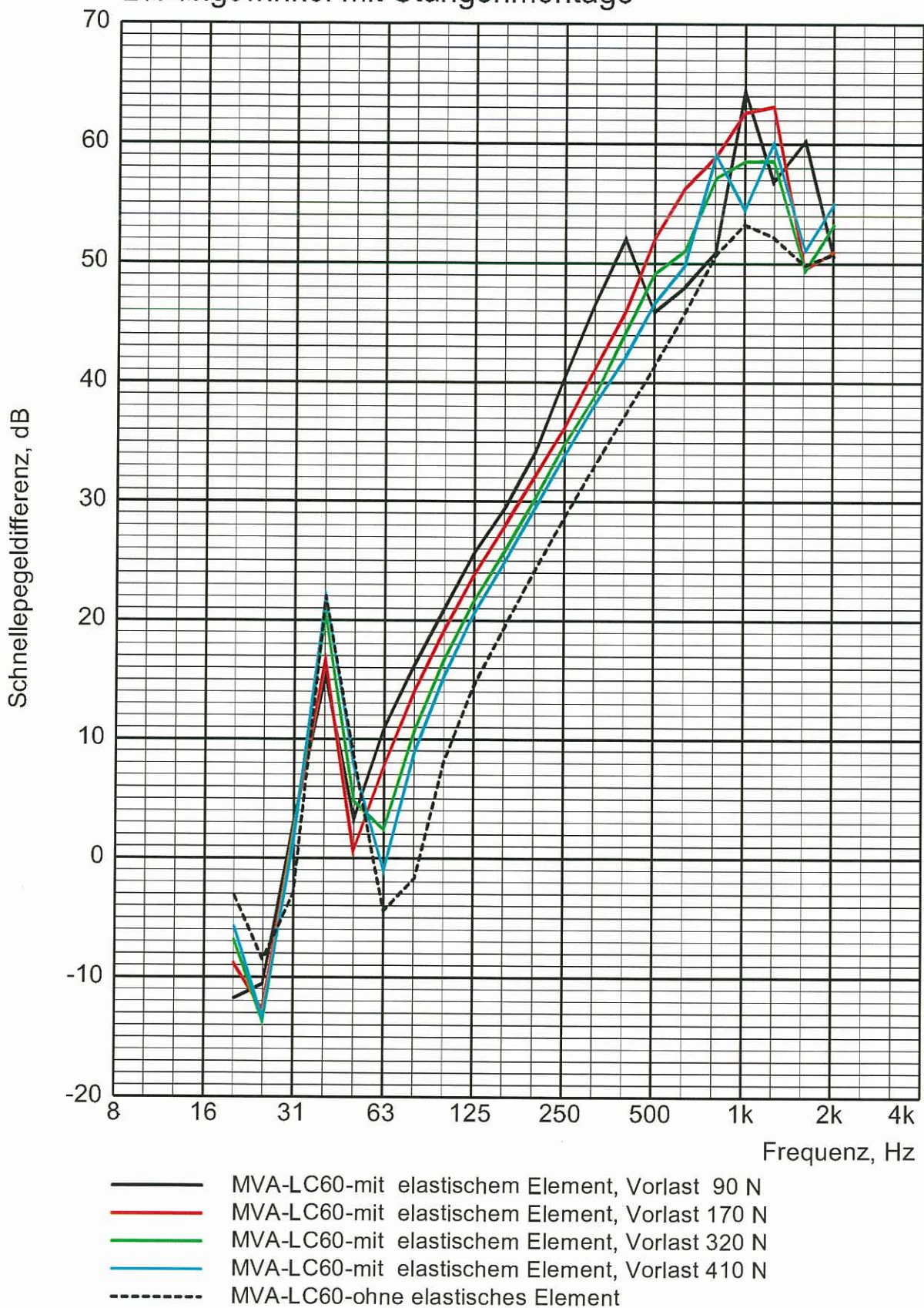
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## **Anhang**

### **Ergebnisse der Schwingungsmessungen Terzspektren der Schnellepegeldifferenzen**

## Ermittlung der Körperschalldämmung nach dem Tonpilzverfahren und der DIN EN ISO 10846-4

Lüftungswinkel mit Stangenmontage





## Ermittlung der Körperschalldämmung nach dem Tonpilzverfahren und der DIN EN ISO 10846-4

Lüftungswinkel mit Direktmontage

