MÜLLER-BBM
Accredited Test Laboratory
according to ISO/IEC 17025
Deutscher Akkreditierungs Rat
DAP-PL-2465.10

Address of the testing facility:
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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

Signature:

Anhang

Ergebnisse der Schwingungsmessungen
Terzspektren der Schnellepegeldifferenzen

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

Lüftungswinkel mit Stangenmontage

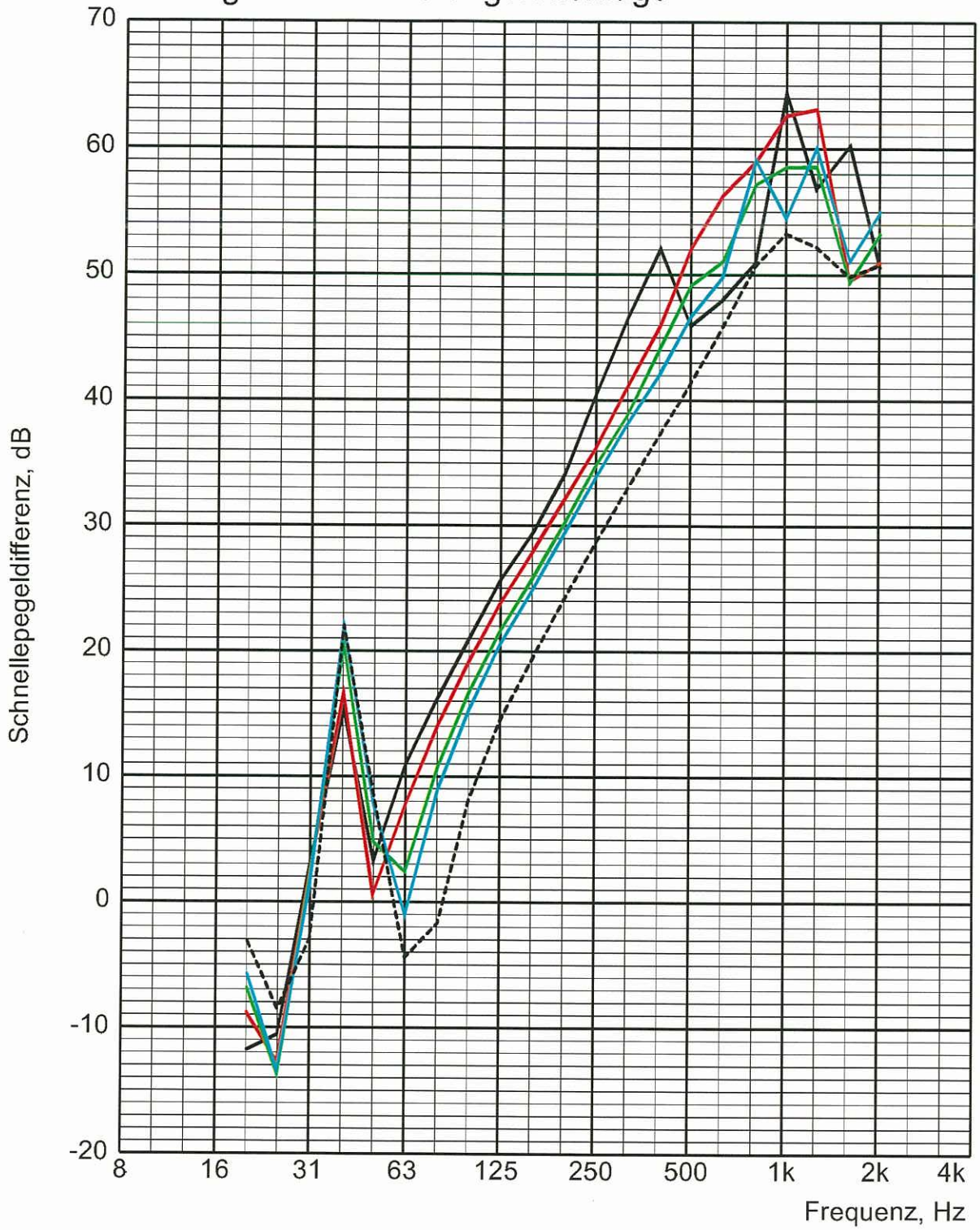

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Abbildung 1

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

Lüftungswinkel mit Direktmontage

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Abbildung 2