

Third Party Approval – Sound Insulation 16 dB(A)

Hilti MP-PI Pipe rings have been tested for sound insulation by SG Bauakustik, third party laboratories.

Tests have been performed in accordance with requirements of DIN 4109.

The results are covered by third party report Nr. 1444-001-13, issued by SG Bauakustik, Institute for acoustic product optimization, 45478 Mülheim a. d. Ruhr, Germany. This report is dated 19.04.2013 and signed by Dipl.-Ing. S. Grüll, SG Bauakustik.

The report proves a sound insulation value of 16 dB(A) for Hilti Pipe Ring MP-PI. As the standard DIN 4109 is requiring a minimum sound reduction value of 15 db(A), our product MP-PI is fully compliant to the requirements.

The report documents that the noise reduction value of MP-PI is up to 9 dB(A) better compared to typical competition products.



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ÖR-Nr.: FL-1 011 557 0 | MWST-Nr.: 50 555

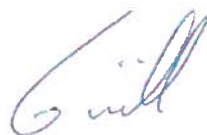
Attachment 1

Excerpt from Report Nr. 1444-001-13, SG Bauakustik.

Original language: German.

| | | |
|------------|-------------------------|-------------------------------|
| Messung 1: | [REDACTED] | VM L _{IN} = 7 dB(A) |
| Messung 2: | [REDACTED] | VM L _{IN} = 8 dB(A) |
| Messung 3: | Hilti MP-PI 32-36 1" M8 | VM L _{IN} = 16 dB(A) |
| Messung 4: | [REDACTED] | VM L _{IN} = 9 dB(A) |
| Messung 5: | [REDACTED] | VM L _{IN} = 13 dB(A) |

Mülheim an der Ruhr, 19.04.2013



Stefan Grüll

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Reprint of all excerpts with authorization of SG-Bauakustik, dated 06.08.2013



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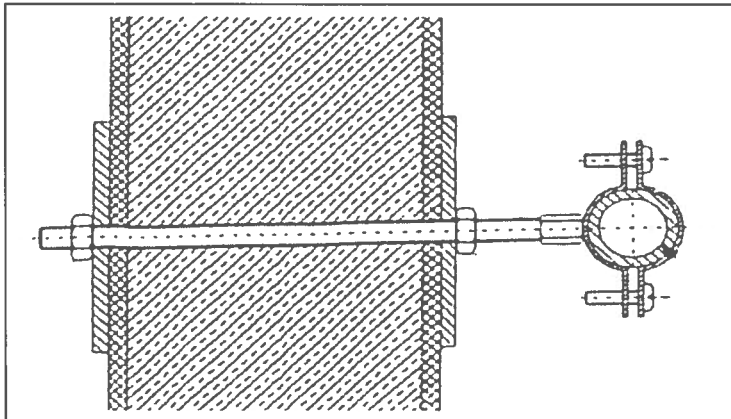
in accordance with ISO 3822-1, 07.99

Client: Hilti Corporation, Feldkircherstrasse 100, FL-9494 Schaan / Liechtenstein
 Testobject: 1" steel water pipe, outside diameter $d = 33.7$ mm, fastened with pipe rings of the type: Hilti MP-PI 32-36 1" M8
 In operation: Tapped with standard installation noise (IGN) in accordance with ISO 3822-1 at a flow pressure of 0.3 Mpa (3 bar)

Assessment:

Measurement of noise transmission at the octave mid-frequencies $f = 125$ to 4000 Hz and calculation of the difference between "rigid" an "isolated" fastening, taking the standard installation noise reference value into account for the assessment, with conversion to the mean noise transmission value to be expected in buildings. Date of test: 18.04.2013, air temperature at the test rig: 18.2 °C, relative humidity: 58.4 %, **Measurement 3:** Hilti MP-PI 32-36 1" M8 pipe ring

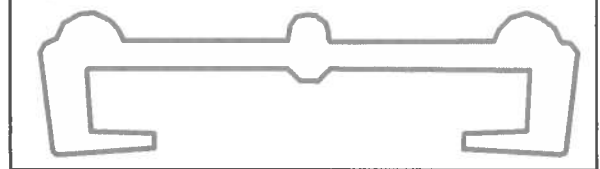
Schematic view of the test rig with item tested:



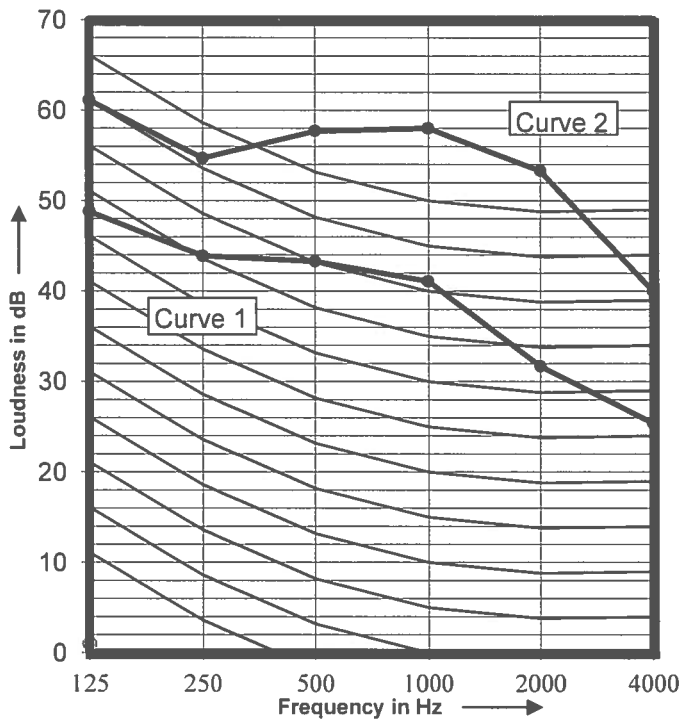
Test criteria:

Test room volume: $V = 74.5$ m³
 Mean reverb. time: $\bar{T}_N = 1.29$ s
 Test wall area: $F = 8.20$ m²
 Weight per unit area: $g_F = 232$ kg/m²
 Test pipe length: $L = 3.20$ m
 Outside diameter: $D = 33.7$ mm
 Flow pressure: $p = 0.30$ Mpa
 Flow rate: $q = 0.13$ l/s

Isolating insert: Rubber profile (schematic view)



Test results:



Assessment:

Curve 1: Noise transmission when fastened with (pipe ring): MP-PI 32-36 1" M8

$L_{IN} = 29$ dB(A)

Curve 2: Noise transmission with rigid fastening

$L_{IN} = 45$ dB(A)

Improvement:

| Frequency [Hz] | 125 | 250 | 500 | 1000 | 2000 | 4000 |
|------------------|------|------|------|------|------|------|
| VM L_{IN} [dB] | 12,3 | 10,8 | 14,4 | 16,9 | 21,6 | 14,6 |

A-assessment $L_{IN} = 16$ dB(A)

Test report no.: 1444-001-13
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 Institut für schalltechnische Produktoptimierung
 Mainstrasse 15
 45478 Mülheim an der Ruhr, 19.04.2013

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