

# Measurement of Water Appliance Noises in the Laboratory

according to DIN EN ISO 3822-1, 07.2009

## Enclosure 3

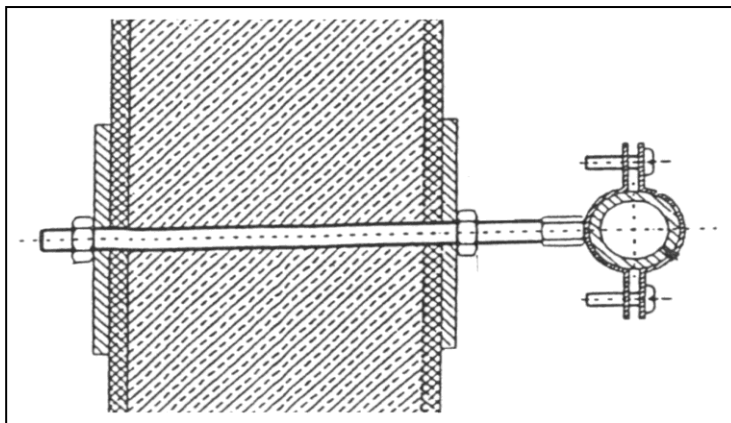
Client: Flamco Flexcon B.V., Amersfoortseweg 9, 3751 LJ Bunschoten, The Netherlands  
 Test object: 1" steel pipe, outer dia  $d = 33,7$  mm, fastened with pipe clamps type **Flamco BSKI 32, 1"**, connection **M8, two-screw-clamp with TPV-insert (60 Shore) with spacer**  
 Operation: Withdrawal with IGN according to DIN EN ISO 3822-1 at flow pressure of 0.3 Mpa (3 bar)

### Evaluation:

Measurement of the noise transmission at octave centre frequencies  $f = 125$  to  $4000$  Hz and calculation of the difference between "rigid" and "decoupled" fastening, Evaluation using the normative IGN-reference values, conversion to the average expected noise transmission in the building. Measurement on 30.06.2015, air temperature in test stand:  $19,8$  °C, relative humidity:  $52,7$  %

### Measurement 1

#### Schematic diagram for build-up of test object:

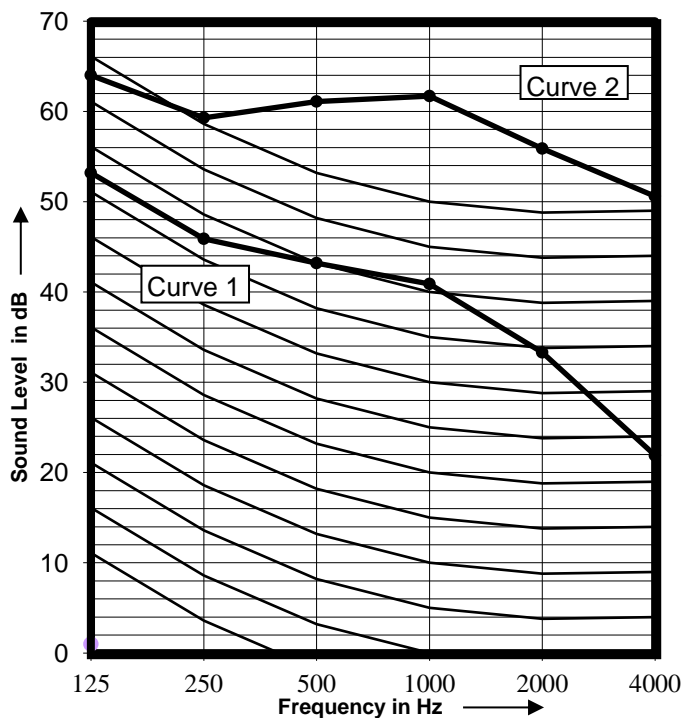


#### Test Criteria:

Volume test room:  $V = 74,5$  m<sup>3</sup>  
 Aver. reverb. time:  $\bar{T}_N = 1,35$  s  
 Area measuring wall:  $F = 8,20$  m<sup>2</sup>  
 Area density:  $g_F = 232$  kg/m<sup>2</sup>  
 Length measuring pipe:  $L = 3,20$  m  
 Outer diameter:  $D = 33,7$  mm  
 Flow pressure:  $p = 0,30$  MPa

Decoupling insert: **TPV-insert**

#### Measuring diagram:



#### Evaluation:

Curve 1: Noise transmission with fastening with pipe clamp type see above

$L_{IN} = 25$  dB(A)

Curve 2: Noise transmission when using rigid fastening

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

#### Improvement:

| Frequency $f$ [Hz] | 125  | 250  | 500  | 1000 | 2000 | 4000 |
|--------------------|------|------|------|------|------|------|
| VM $L_{IN}$ [dB]   | 10,8 | 13,4 | 17,9 | 20,8 | 22,6 | 28,7 |

**A-Evaluation**  $L_{IN} = 20$  dB(A)

No. of Test Report: 1561-001-15  
 SG-Bauakustik  
 Institut für schalltechnische Produktoptimierung  
 Mainstrasse 15  
 45478 Mülheim an der Ruhr, 07.07.2015

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# Measurement of Water Appliance Noises in the Laboratory

according to DIN EN ISO 3822-1, 07.2009

## Enclosure 4

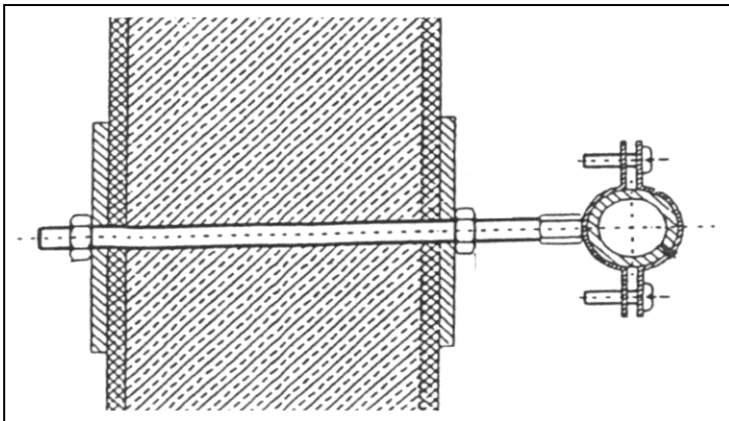
Client: Flamco Flexcon B.V., Amersfoortseweg 9, 3751 LJ Bunschoten, The Netherlands  
 Test object: 1" steel pipe, outer dia  $d = 33,7$  mm, fastened with pipe clamps type **Flamco BSKI 32, 1"**, connection **M8, two-screw-clamp with TPV-insert (60 Shore) without spacer**  
 Operation: Withdrawal with IGN according to DIN EN ISO 3822-1 at flow pressure of 0.3 Mpa (3 bar)

### Evaluation:

Measurement of the noise transmission at octave centre frequencies  $f = 125$  to  $4000$  Hz and calculation of the difference between "rigid" and "decoupled" fastening, Evaluation using the normative IGN-reference values, conversion to the average expected noise transmission in the building. Measurement on 30.06.2015, air temperature in test stand:  $19,8$  °C, relative humidity:  $52,7$  %

### Measurement 2

#### Schematic diagram for build-up of test object:

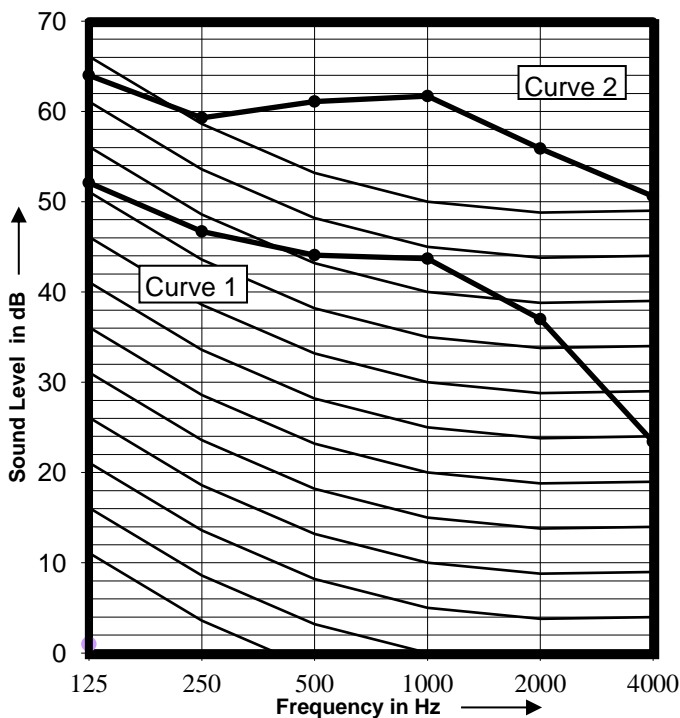


#### Test Criteria:

Volume test room:  $V = 74,5$  m<sup>3</sup>  
 Aver. reverb. time:  $\bar{T}_N = 1,35$  s  
 Area measuring wall:  $F = 8,20$  m<sup>2</sup>  
 Area density:  $g_F = 232$  kg/m<sup>2</sup>  
 Length measuring pipe:  $L = 3,20$  m  
 Outer diameter:  $D = 33,7$  mm  
 Flow pressure:  $p = 0,30$  MPa

Decoupling insert: **TPV-insert**

#### Measuring diagram:



#### Evaluation:

Curve 1: Noise transmission with fastening with pipe clamp type see above

$L_{IN} = 27$  dB(A)

Curve 2: Noise transmission when using rigid fastening

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

#### Improvement:

| Frequency $f$ [Hz] | 125  | 250  | 500  | 1000 | 2000 | 4000 |
|--------------------|------|------|------|------|------|------|
| VM $L_{IN}$ [dB]   | 11,9 | 12,6 | 17,0 | 18,0 | 18,9 | 27,2 |

**A-Evaluation**  $L_{IN} = 18$  dB(A)

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