

## Test Report P-BA 77/2017e

# Determination of the Acoustic Performance of a Wastewater Installation System in the Laboratory according to EN 14366

**Client:** Redi S.p.a.  
Via Madonna dei Prati, 5/A  
40069 Zola Predosa  
Italy

**Test object:** Wastewater installation system consisting of plastic pipes and fittings "PhonoBlack", OD 110 x 3.2, (manufacturer: Redi) with plastic pipe clamps "Phonoklip" (manufacturer: Girpi).

**Content:**

Results sheet 1:	Summary of test results
Figures 1 to 3:	Detailed results
Figures 4 and 5:	Test set-up
Annex A:	Measurement set-up, noise excitation, acoustic parameters
Annex F:	Evaluation of measurements
Annex P:	Description of the test facility
Annex V:	Assessment according to VDI 4100

**Test date:** The measurement was carried out on April 24, 2017 in the test facilities of the Fraunhofer Institute for Building Physics in Stuttgart.

Stuttgart, May 24, 2017

Responsible Test Engineer:

Head of Laboratory:

M.Sc. B. Kaltbeitzel

M.B.P. Dipl.-Ing.(FH) S. Öhler



The test was carried out in a laboratory, accredited according to DIN EN ISO/IEC 17025:2005 by DAkkS. The accreditation certificate is D-PL-11140-11-01.

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# Determination of the Acoustic Performance of a Wastewater Installation System in the Laboratory

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Results sheet 1

**Client:** Redi S.p.a., Via Madonna dei Prati 5/A, 40069 Zola Predosa, Italy

**Test specimen:** Wastewater installation system consisting of plastic pipes and fittings "PhonoBlack" (OD 110 x 3.2, manufacturer: Redi) with plastic pipe clamps "Phonoklip" (manufacturer: Girpi).  
(test object no.: 11064-2; see figure 4 and 5)

**Test set-up:**

- The pipe system was mounted according to figure 4 (see also Annex A).
- The system consisted of wastewater pipes (nominal size OD 110 x 3.2), three inlet tees (87.5°), two 45°-basement bends and a horizontal drain section. The inlet tees in the basement and in the ground floor were closed by lids. Plug connection of the pipes and fittings (shaped pipe sockets).
  - Pipe system: single layer pipes "PhonoBlack", material PVC modified with mineral filler, size OD 110, wall thickness 3.2 mm (3.3 mm, measured by IBP), weight 1.65 kg/m, density approx. 1.55-1.60 g/cm<sup>3</sup> (1.5 g/cm<sup>3</sup> measured by IBP).
  - Single layer fittings, material PVC, size OD 110, wall thickness 3.2 mm (3.3 mm measured by IBP), density 1,6 g/cm<sup>3</sup> measured by IBP.
  - Plastic pipe clamps "Phonoklip" 110 mm (manufacturer: Girpi) (see figure 5): In each storey (EG and UG) two clamps were installed, one in the lower and one in the upper wall area. Guide position in the upper wall area with red spacers and in the lower wall area the anchor position without spacers. The pipe clamps were fixed to the installation wall with dowels and thread rods.

The wastewater installation system was mounted by a technician under the authority of Fraunhofer IBP.

**Test facility:** Installation test facility P12, mass per unit area of the installation wall: 220 kg/m<sup>2</sup>, mass per unit area of the ceiling: 440 kg/m<sup>2</sup>. Installation rooms: sub-basement (KG), basement (UG) front, ground floor (EG) front and top floor (DG), measuring rooms: UG front, UG rear (details in Annex P and EN 14366: 2005-02)

**Test method:** The measurements were performed according to EN 14366; noise excitation by steady water flow with 0.5 l/s, 1.0 l/s, 2.0 l/s and 4.0 l/s. Additional evaluation for comparison with requirements following German standards DIN 4109-1:2016-07 and VDI 4100:2012-10 (details in Annexes A, F and V).

**Result:**

"PhonoBlack" (OD 110 x 3.2, manufacturer: Redi) with plastic pipe clamps "Phonoklip" (manufacturer: Girpi)	Flow rate [l/s]				
	0.5	1.0	2.0	4.0	
Airborne sound pressure level $L_{p,A}$ [dB(A)] <b>according to EN 14366</b> for the basement test-room	UG front	44	48	51	54
Structure-borne sound characteristic level $L_{sc,A}$ [dB(A)] <b>according to EN 14366</b> for the basement test-room	UG rear	< 10	< 10	13	19
Installation sound level $L_{A,Feq,n}$ [dB(A)] <b>following DIN 4109</b> in the basement test-room	UG front	44	48	51	54
	UG rear	< 10	13	17	22
Installation sound level $\overline{L_{A,Feq,nT}}$ [dB(A)] <b>following VDI 4100</b> in the basement test-room	UG front	42	45	49	52
	UG rear	< 10	< 10	14	19

**Test date:** April 24, 2017

**Notes:**

- For comparing test results with requirements note Annex A.
- Sound levels below 10 dB(A) are not mentioned in the test report, since they are subject to an increased measurement uncertainty and moreover are not noticeable in a normal living environment.



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Stuttgart, May 24, 2017  
Head of Laboratory: