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Test Report P-BA 62/2019e

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

Client: Wavin T&I
Rollepaal 20
7701 BS Dedemsvaart, Netherlands

Test object: Wastewater system "Sitech+,110x3.4,PP-MB, 21.03.19" (manufacturer: Wavin). The wastewater system consisted of straight plastic pipes and fittings and pipe clamps "Wavin Low Noise bracket" with elastic inlay and spacers (manufactured by Walraven) mounted as sliding and fixing clamps.

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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 18, 2019 in the test facilities of the Fraunhofer Institute for Building Physics in Stuttgart.

Stuttgart, June 4, 2020

Responsible Test Engineer:

Dipl.-Ing.(FH) J. Mohr

Head of Laboratory:

M.BP. Dipl.-Ing.(FH) S. Öhler

The test was carried out in a laboratory, accredited according to DIN EN ISO/IEC 17025:2018 by DAkkS. The accreditation certificate is D-PL-11140-11-01.

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ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-11140-11-01

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

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Results sheet 1

Client: Wavin T&I, Rollepaal 20, 7701 BS Dedemsvaart, Netherlands

Test specimen: Wastewater system "Sitech+,110x3.4,PP-MB, 21.03.19" (manufacturer: Wavin). The wastewater system consisted of straight plastic pipes and fittings and pipe clamps "Wavin Low Noise bracket" with elastic inlay and spacers (manufactured by Walraven) mounted as sliding and fixing clamps. Test object no.: 11065-12; 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), three inlet tees (87°), two 45°-basement bends and a horizontal drain section. The inlet tees in the basement and in the ground floor were closed by plugs supplied by the manufacturer.
  - Pipe system: "Sitech+,110x3.4,PP-MB, 21.03.19": Three-layer pipes: Material PP, wall thickness 3.7 mm, weight 1.52 kg/m, density 1.22 g/cm³, values measured by IBP. One-layer fittings: Material PP, wall thickness 3.6 mm, density 1.64 g/cm³, values measured by IBP. Plug connection of the pipes and fittings (shaped pipe sockets).
  - Pipe clamps: Steel pipe clamps "Wavin Low Noise bracket" with elastic inlay and with spacers (manufactured by Walraven) mounted as sliding and fixing clamps. In every storey (EG and UG) two pipe clamps were installed. In the upper wall area one clamp was mounted as a sliding clamp with one white spacer (15.3 mm) on both sides of the clamp. In the lower wall area one clamp was mounted as a fixing clamp with one black spacer (10 mm) on both sides of the clamp. The clamps were fixed to the installation wall with dowels and thread rods (figure 5).

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/m², mass per unit area of the ceiling: 440 kg/m². 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: 2020-02).

Test method: The measurements were performed according to EN 14366:2020-02; 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 4109:2018-01 and VDI 4100:2012-10 (details in Annexes A, F and V).

Result:

Wastewater system "Sitech+,110x3.4,PP-MB, 21.03.19" (manufacturer: Wavin). The wastewater system consisted of straight plastic pipes and fittings and pipe clamps "Wavin Low Noise bracket" with elastic inlay and spacers (manufactured by Walraven) mounted as sliding and fixing clamps.		Flow rate [l/s] 0.5	1.0	2.0	4.0
Airborne sound pressure level $L_{a,A}$ [dB(A)] **according to EN 14366** for the basement test-room	UG front	46	50	51	54
Structure borne sound characteristic level $L_{sc,A}$ [dB(A)] **according to EN 14366** for the basement test-room	UG rear	15	18	19	23
Installation sound level $L_{AFeq,n}$ [dB(A)] **following DIN 4109** in the basement test-room	UG front	46	50	51	54
	UG rear	18	20	21	25
Installation sound level $\overline{L_{AFeq,nT}}$ [dB(A)] **following VDI 4100** in the basement test-room	UG front	44	47	49	52
	UG rear	14	16	18	21

Test date: April 18, 2019

Notes: - For comparing test results with requirements note Annex A.

Fraunhofer IBP

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Stuttgart, June 4, 2020
Head of Laboratory: