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Test Report P-BA 82/2016e

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

Client: Nicoll Polska Sp. z o.o.
Ul. Energetyczna 6
56-400 Oleśnica
POLAND

Test object: Wastewater installation system consisting of plastic pipes and fittings "dBlue DN 110 x 3.4" (manufacturer: Nicoll Polska Sp. z o.o.) and "acoustic sleeves" (manufacturer: Aliaxis Companies) mounted with pipe clamps "Phonoklip" (manufacturer: Aliaxis Companies).

Content:

Test date: The measurement was carried out on April 14, 2016 in the test facilities of the Fraunhofer Institute for Building Physics in Stuttgart.

Stuttgart, May 2, 2016

Responsible Test Engineer: Head of Laboratory:

Dipl.-Ing.(FH) J. Mohr M.BP. 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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ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-11140-11-01

Determination of the Installation Sound Level L_{In} in the Laboratory

P-BA 82/2016e
Results sheet 1

Client: Nicoll Polska Sp. z o.o., Ul. Energetyczna 6, 56-400 Oleśnica, POLAND

Test specimen: Wastewater installation system consisting of plastic pipes and fittings "dBlue DN 110 x 3.4" (manufacturer: Nicoll Polska Sp. z o.o.) and "acoustic sleeves" (manufacturer: Aliaxis Companies) mounted with pipe clamps "Phonoklip" (manufacturer: Aliaxis Companies), test object no.: 10939-7.

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 (90°), two 45°-basement bends with intermediate calming section (25 cm) and a horizontal drain section. The inlet tees in the basement and in the ground floor were closed by lids supplied by the manufacturer.
  - Pipe system "dBlue DN 110 x 3.4": Three-layer pipe with attached sleeve. Internal layer: PP copo; medial layer: PP MD, external layer: PP copo. Wall thickness 3.4 mm (up to 4.0 mm according to EN 1451), weight 1.7 kg/m, density 1.2 g/cm³. One-layer fittings: PP MD, wall thickness 3.4 mm, density 1.2 g/cm³. Connection of the pipes by plug-on socket connection. Information supplied by the client.
  - "Acoustic sleeves": Material PVC/EPDM, wall thickness 2.75 mm, weight 0.7 kg/m. In the rooms EG and UG respectively two sleeves were mounted about 10 cm above and below the lower pipe clamp (figure 5).
  - Pipe clamps "Phonoklip" (figure 5): Acoustic plastic pipe clamps without elastomer inlay. On each floor (EG and UG) two clamps were installed. The upper clamp was a loose clamp (14 mm distance of the clamp flanges on one side by a 13 mm hard spacer and a plastic clip). The lower clamp was a fixing clamp without spacers. The clamps were mounted so that they are not unduly bent and the two parts of the safety clamps on each side of the bracket do not touch each other (figure 5). The clamps were fixed to the installation wall with dowels and screws.

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: 2005-02).

Test method: The measurements were performed following German standard DIN 4109 and EN 14366; noise excitation by constant water flow with 0.5 l/s, 1.0 l/s, 2.0 l/s and 4.0 l/s (details in Annexes A and F).

Result:

Wastewater installation system consisting of plastic pipes and fittings "dBlue DN 110 x 3.4" (manufacturer: Nicoll Polska Sp. z o.o.) and "acoustic sleeves" (manufacturer: Aliaxis Companies) mounted with pipe clamps "Phonoklip" (manufacturer: Aliaxis Companies). Mounting details see test set up.

Flow rate [l/s]	0.5	1.0	2.0	4.0
Installation sound level $L_{AFeq,n}$ (L_{In}) [dB(A)] **according to DIN 4109** measured in the basement test-room UG front	45	47	50	52
Installation sound level $L_{AFeq,n}$ (L_{In}) [dB(A)] **according to DIN 4109** measured in the basement test-room UG rear	10	10	14	20
Installation sound level $\overline{L_{AFeq,nT}}$ (L_{In}) [dB(A)] **according to VDI 4100** measured in the basement test-room UG front	42	45	47	49
Installation sound level $\overline{L_{AFeq,nT}}$ (L_{In}) [dB(A)] **according to VDI 4100** measured in the basement test-room UG rear	<10	<10	11	17
Airborne sound pressure level $L_{a,A}$ [dB(A)] **according to EN 14366** in the basement test-room UG front	45	47	50	52
Structure-borne sound characteristic level $L_{s,A}$ [dB(A)] **according to EN 14366** in the basement test-room UG rear	<10	<10	10	16

Test date: April 14, 2016

Notes:
- The requirements of DIN 4109 and VDI 4100 only apply for the test room UG rear.
- 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.

Fraunhofer IBP

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Stuttgart, May 2, 2016
Head of Laboratory: