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Test Report P-BA 26/2016e


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

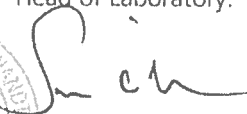
- Client:** Nicoll Polska Sp. z o.o.
Ul. Energetyczna 6
56-400 Oleśnica
POLAND
- Test object:** Wastewater installation system consisting of plastic pipes and fittings "dBlue DN 110 x 3.4" with pipe clamps "dBlue Clamp" (manufacturer: Nicoll Polska Sp. z o.o.).
- Content:**
- | | |
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| 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 September 30, 2015 in the test facilities of the Fraunhofer Institute for Building Physics in Stuttgart.

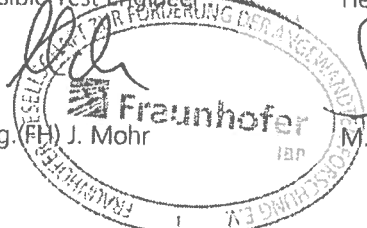
Stuttgart, February 1, 2016

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

P-BA 26/2016e

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" with pipe clamps "dBlue Clamp" (manufacturer: Nicoll Polska Sp. z o.o.), test object no.: 10859-5.

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 (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.
- Pipe clamps "dBlue Clamp" (figure 5): Steel pipe clamps with elastic inlay mounted as supporting and fixing clamps. In both rooms EG front and UG front, the upper clamp was a loose clamp with no contact to the pipe (12 mm distance of the clamp flanges by two 6 mm hard spacers and elastic inlay removed). The lower clamp consisted of two clamps: the supporting clamp had 18 mm distance of the clamp flanges by three 6 mm hard spacers and was a loose clamp without contact to the pipe, above the fixing clamp had no spacer (to hold the pipe). Both clamps connected via the rubber inlay of the clamps. All clamps were tightened with a torsional moment of 3 Nm. The 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/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 "dBlue DN 110 x 3.4" with pipe clamps "dBlue Clamp" mounted as supporting and fixing clamps (manufacturer: Nicoll Polska Sp. z o.o.).		Flow rate [l/s]			
		0.5	1.0	2.0	4.0
Installation sound level $L_{A,eq,n}$ (L_{in}) [dB(A)] according to DIN 4109 measured in the basement test-room UG front		49	50	51	54
Installation sound level $L_{A,eq,n}$ (L_{in}) [dB(A)] according to DIN 4109 measured in the basement test-room UG rear		18	20	20	22
Installation sound level $L_{A,eq,nT}$ (L_{in}) [dB(A)] according to VDI 4100 measured in the basement test-room UG front		46	48	49	51
Installation sound level $L_{A,eq,nT}$ (L_{in}) [dB(A)] according to VDI 4100 measured in the basement test-room UG rear		15	16	17	19
Airborne sound pressure level $L_{p,A}$ [dB(A)] according to EN 14366 in the basement test-room UG front		49	50	51	54
Structure-borne sound characteristic level $L_{s,CA}$ [dB(A)] according to EN 14366 in the basement test-room UG rear		14	16	16	18

Test date: September 30, 2015

Notes:

- The requirements of DIN 4109 and VDI 4100 only apply for the test room UG rear.
- For the experimental setup investigated in the test facility the used supporting and fixing clamps normally doesn't guarantee a realistic load transmission. Consequently, in case of practical application in a real building, higher levels of installation noise may be expected.



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Stuttgart, February 1, 2016
Head of Laboratory:

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