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Test Report P-BA 258/2019e

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

Client: Valsir S.p.A.
Localita Merlaro, 2
25078 Vestone (BS)
Italy

Test object: Wastewater installation system consisting of plastic pipes and fittings "BLACKFIRE" (manufacturer: Valsir) mounted with pipe clamps "Bismat 1000" made by Walraven.

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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 November 27, 2019 in the test facilities of the Fraunhofer Institute for Building Physics in Stuttgart.

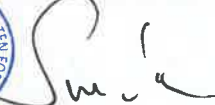
Stuttgart, December 02, 2019

Responsible Test Engineer:



M.Sc. B. Kaltbeitzel

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 17025:2005 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 according to EN 14366

P-BA 258/2019e

Results sheet 1

- Client:** Valsir S.p.A., Localita Merlaro 2, 25078 Vestone (BS), Italy
- Test specimen:** Wastewater installation system consisting of plastic pipes and fittings "BLACKFIRE" (manufacturer: Valsir) mounted with pipe clamps "Bismat 1000" made by Walraven. (test object no.: 11306-2; see figure 4 and 5)
- Test set-up:**
- The pipe system was mounted according to figure 4 and 5 (see also Annex A).
 - The system consisted of wastewater pipes (nominal size OD 110 x 3.4), 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: three layer pipes "BLACKFIRE", material PP-ML, size OD 110, wall thickness 3.9 mm (measured by IBP), weight 1.38 kg/m (measured by IBP), density 1.06 g/cm³ (measured by IBP).
 - Single layer fittings, material PP, size OD 110, wall thickness 3.9 mm measured by IBP, density approx. 1.1 g/cm³ measured by IBP.
 - Pipe clamps "Bismat 1000" (figure 5): Structure-borne sound insulating support attachment consisting of Bismat SL guidance clamps and Bismat SX socket clamps. In each storey (EG and UG) respectively two double clamps were installed at the wall. To prevent contact to the pipe, the guidance clamp (SL) was mounted with 15 mm space between the locking tabs of the clamp (two 7.5 mm spacers on each side). The Bismat 1000 clamps were fixed to the installation wall with an adjustable wall plate 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 according to EN 14366:2005-02; 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 4109-1:2018-01 and VDI 4100:2012-10 (details in Annexes A, F and V).

Result:

"BLACKFIRE" (manufacturer: Valsir) mounted with pipe clamps "Bismat 1000" made by Walraven. (test object no.: 11306-2; see figure 4 and 5)		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	44	48	51	53
Structure-borne sound characteristic level $L_{sc,A}$ [dB(A)] according to EN 14366 for the basement test-room	UG rear	< 10	13	16	19
Installation sound level $L_{AFeq,n}$ [dB(A)] following DIN 4109 in the basement test-room	UG front	44	48	51	53
	UG rear	< 10	15	18	21
Installation sound level $\overline{L}_{AFeq,nT}$ [dB(A)] following VDI 4100 in the basement test-room	UG front	42	46	49	51
	UG rear	< 10	11	15	17

Test date: November 27, 2019

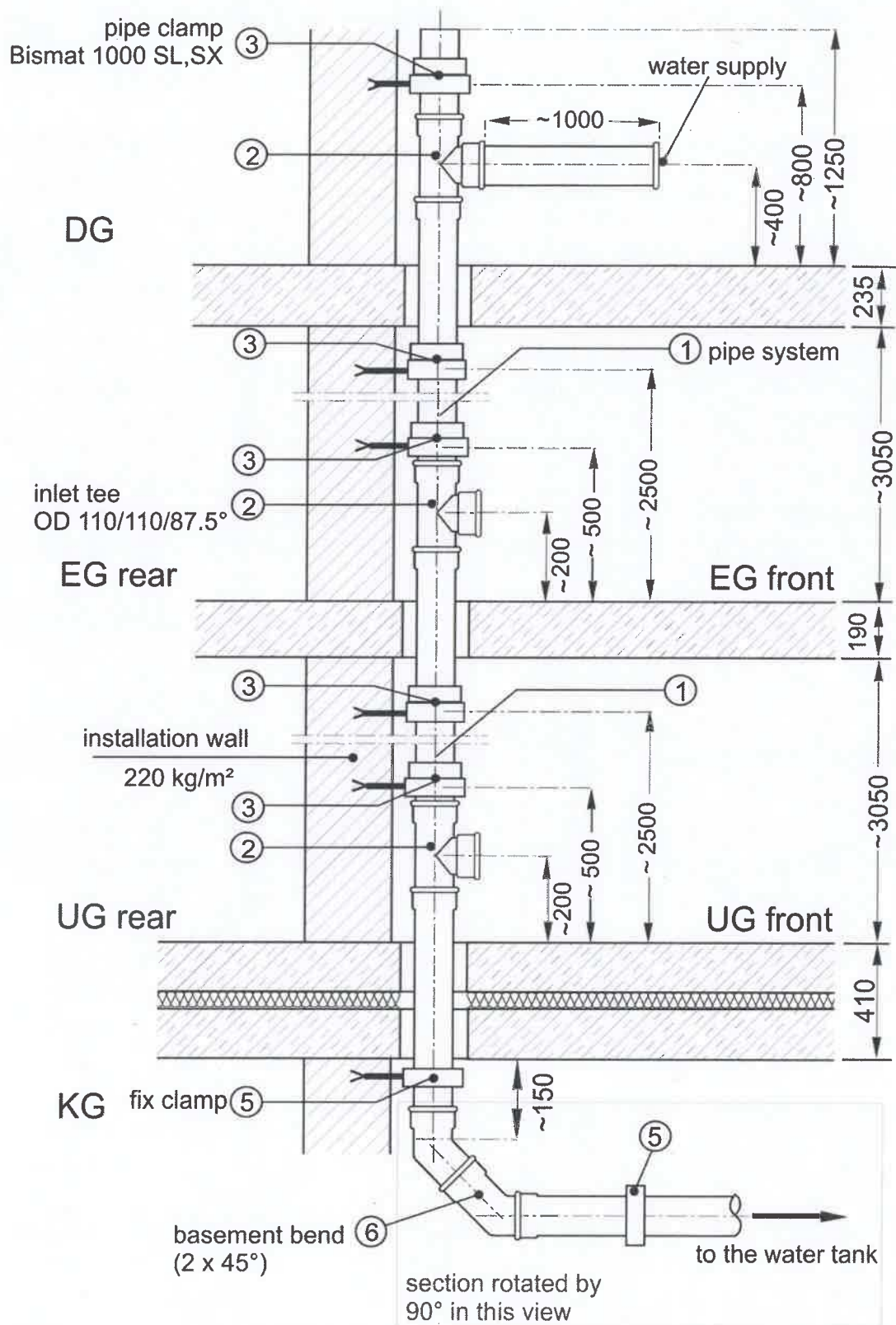
- Notes:**
- For comparing test results with requirements note Annex A.
 - The above-mentioned measurement results require careful assembly of the pipe clamps (see test set-up).
 - Sound levels below 10 dB(A) are not mentioned in the test report, since they are subject to an increased measurement uncertainty and moreover are not noticeable in a normal living environment.



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-1140-11-01.

Stuttgart, December 02, 2019
Head of Laboratory:





Installation plan of the test set-up in the test facility. Illustration simplified, schematically drawn and not to scale.

Test specimen: Wastewater installation system consisting of plastic pipes and fittings "BLACKFIRE" (manufacturer: Valsir) mounted with pipe clamps "Bismat 1000" made by Walraven. (test object no.: 11306-2; see figure 4 and 5)