



**Schallwerte nach EN 14366 und DIN 4109 geprüft durch Fraunhofer-Institut
Zertifikat P-BA 258/2019e**

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:

		Flow rate [l/s]			
		0.5	1.0	2.0	4.0
"BLACKFIRE" (manufacturer: Valsir) mounted with pipe clamps "Bismat 1000" made by Walraven. (test object no.: 11306-2; see figure 4 and 5)				2.0	
Airborne sound pressure level $L_{p,A}$ [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 $L_{A,Feq,n}$ [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 $\overline{L_{A,Feq,nT}}$ [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

