

Test Report No.

22000631-19-U-03-e

Client

Saudi Vitrified Clay Pipe Co., Ltd.
P.O. Box 6415
Riyadh 11442

Kingdom of Saudi Arabia

Conclusion of the contract

08.12.2000

Date of visits/sampling

16 - 18.12.2019

Date of testing

16 - 18.12.2019

Order

Monitoring test 2019 according to control agreement No. 22000631 dated Dec 08, 2000 including audit/inspection of testing, controlling of records and sampling at the client's production sites Factory Plant 1 and Factory Plant 2, 2nd Industrial Area, Riyadh 11442, KSA.

Samples

Vitrified clay pipes jointed by system C according to EN 295-1.
Designation: **DN 200 SS x 1750 - System C - 40 kN/m - Class 200**

Description of the tests/underlying specifications

DIN EN 295-1 „Vitrified clay pipe systems for drains and sewers – Part 1: Requirements for pipes, fittings and joints“, May 2013

DIN EN 295-2 „Vitrified clay pipe systems for drains and sewers – Part 2: Evaluation of conformity and sampling“, May 2013

DIN EN 295-3 „Vitrified clay pipe systems for drains and sewers – Part 3: Test methods“, March 2012

The results of the tests refer exclusively to the samples named above. Reports may only be published or reproduced without the permission of MPA NRW if unchanged in form and content. The abridged reproduction of a report requires the consent of MPA NRW. In the case of electronical transmission of reports the print-out version of the original document remains the legally binding version.

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1 Sampling

The manufacture of the vitrified clay pipes takes place in both of the production plants either Factory Plant 1 or Factory Plant 2 in the 2nd Industrial Area, Riyadh, 11442, KSA. The sampling was conducted accordingly.

2 Results of the tests

2.1 Appearance of the pipes

The pipes were sounding clear and were free from such defects as would impair their function when in service. The pipes were glazed of dark brown colour.

2.2 Dimensions

Table 1: Dimensions

		Pipe 1	Pipe 2	Pipe 3	Target values in acc. with DIN EN 295-1	Permissible deviations in acc. with DIN EN 295-1	Require- ment fulfilled
Minimum bore d_1 [mm]	Spigot	197.4	198.1	197.6	≥ 195	--	yes
	Socket	196.8	197.0	196.9			yes
Length l [mm]	min.	1760	1762	1760	1750	+70 -17.5	yes
	max.	1763	1765	1762			
Deviation from squareness of the ends [mm]	Spigot	3.2	2.9	3.0	≤ 6	--	yes
	Socket	3.4	3.1	3.3			yes
Deviation from straightness [mm/m]		1.9	2.1	2.0	≤ 4	--	yes
Socket fairing internal diameter d_4 [mm]		260.3	260.2	260,2	260.0	± 0.5	yes
Invert conformity [mm]	a_{sp-1}	32.1	32.3	32.8	Difference ≤ 4	--	yes
	a_m	34.8	34.7	35.6			
Thickness of the wall s_1 [mm]	Spigot	23.2	23.1	23.4	--	--	--

2.3 Watertightness and crushing strength in accordance with DIN EN 295-1, clauses 5.9 and 5.14

For testing the water tightness and in order to determine the water adding value, the vitrified clay pipes were filled with water in accordance with DIN EN 295-1, clause 5.14 and DIN EN 295-3, clause 12, and a water pressure of 0.5 bar was applied for the duration of 1 hour pre-conditioning time. After another 15 minutes time the water adding value was determined by (l / m²).

For determining the crushing strength of vitrified clay pipes according to DIN EN 295-1, clause 5.9, the pipes were preconditioned according to DIN EN 295-3, clause 7.1.1, method a) (complete immersion in a container filled with water at ambient temperature for a minimum duration time according to EN 295-3, table 1).

Table 2: Watertightness and crushing strength

Samples	Watertightness		Crushing strength	
	Visual inspection of leakage pipe surface	Water addition W ₁₅ [l/m ²]	Preconditioning [hours]	Force at break FN [kN/m]
1	no leakage/dry	0.004	≥ 66	57.3
2				54.8
3				57.9
Set values:	no leakage no wet areas	≤ 0.040	≥ 66	≥ 40
Requirements:	yes	yes	yes	yes

2.4 Marking (impressed)

EN-Marking: EN 295-1, SASO/GSO
 Manufacturer's identification: SVCP
 Date of manufacturing: 04.12.2019 - 04.12.2019 - 04.12.2019
 Nominal size: DN 200 SS
 Class: C - Class 200 - 45 KN/M *
 Identification symbol of the third party certification body: --

*= Pipe marking declares higher crushing strength than the class number to EN 295-1

2.5 Bending moment resistance according to DIN EN 295-1, clause 5.11

The bending moment resistance was tested according to DIN EN 295-1, clause 5.11 and DIN EN 295-3, clause 9.3 by using a three-point longitudinal bending strength test. The test setup corresponded to DIN EN 295-3, figure 9.

Serial number of sample	Breaking force [kN]	Bending moment resistance [kNm]
1	47.5	17.0
2	45.3	14.5
3	51.1	14.6
Requirement	--	≥ 7.4
fulfills requirement	--	yes

2.6 Airtightness of the pipes including pipe joint according to DIN EN 295-1, clause 5.18

Test performed according to clause 5.18 of EN 295-1 and section 16 of EN 295-3 on a test setup consisting of 1 pipe by applying an air gauge pressure of 10 mbar for a period of **5 minutes time**. Requirement: The gauge pressure must not drop below 7.5 mbar.

DIN EN 295-1, clause 5.18	Test pressure [mbar]	Permissible Δp [mar]	Test time [min]	Requirement fulfilled
1 Pipe	10	2.5	5	yes

2.9 Water absorption (boiling test) in accordance with DIN EN 295-1, clause 5.1.3

The specimen was tested in accordance with DIN EN 295-3 section 28.2 by drying at a temperature of $(115 \pm 5) ^\circ\text{C}$ until in two consecutive weighings no further mass loss could be observed. Subsequently, the specimen was immersed in a container of cold water and brought to the boil. The water was maintained boiling for 1 hour time. After cooling, the specimen was taken out of the water and gently dried with a towel and reweighed.

Sample No.	Dry weight [g]	Weight after 1 hour boiling [g]	Water absorption [g]	Water absorption [%]	Set values DIN EN 295-1	Requirement fulfilled
1	797.9	813.1	15.2	1.9	$\leq 6 \%$	yes

3 Assessment

Concerning the tested characteristics, the tested vitrified clay pipes **DN 200 SS x 1750 - System C - 40 kN/m - Class 200** meet the requirements of DIN EN 295-1. The results correspond to the results of the internal routine tests.

Dortmund, 31.03.2020

By order




Dipl.-Ing. (FH) Tayyar Uysal
 Inspector