MPA NRW.
Materialprüfungsamt Nordrhein-Westfalen
PRÜFEN • ÜBERWACHEN • ZERTIFIZIEREN
Marsbruchstraße 186 • 44287 Dortmund • Postfach: 44285 Dortmund • Telefon (02 31) 45 02-0 • Telefax (02 31) 45 85 49 • E-Mail: info@mpanrw.de

Test Report No. 220000631-19-U-01-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 F according to EN 295-1.
Designation: **DN 100 x 1000 - System F - 34 kN/m**

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

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-11142-01-01

This report consists of 4 pages.

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	Requirement fulfilled
Minimum bore d_1 [mm]	Spigot	97.3	97.4	96.9	≥ 96	--	yes
	Socket	96.8	97.0	96.4			yes
Length l [mm]	min. max.	1024 1026	1024 1025	1023 1025	1000	+40 -10	yes
Deviation from squareness of the ends [mm]	Spigot	2.0	1.2	1.0	≤ 6	--	yes
	Socket	2.0	2.3	3.9			yes
Deviation from straightness [mm/m]		0.8	1.0	0.6	≤ 5	--	yes
Outside diameter d_3 [mm]	Spigot	131.4	131.5	131.4	131.0	± 1.5	yes
Thickness of the wall s_1 [mm]	Spigot	14.3	14.1	14.1	--	--	--

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

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 / m^2).

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	0.000	≥ 42	43.9
2				37.7
3				40.0
Set values:	no leakage no wet areas	≤ 0.040	≥ 42	≥ 34
Requirements:	yes	yes	yes	yes

2.4 Marking (impressed)

EN-Marking:	EN 295-1, SASO 236-95
Manufacturer's identification:	SVCP
Date of manufacturing:	06.03.2018 - 06.03.2018 - 06.03.2018
Nominal size:	DN 100 MM
Class:	F - 34 KN/M
Identification symbol of the third party certification body:	--

2.5 Air tightness 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 [mbar]	Test time [min]	Requirement fulfilled
1 Pipe	10	2.5	5	yes

2.6 Water tightness of the pipe joint under angular deflection according to DIN EN 295-1, clause 6.2.2

Test performed according to DIN EN 295-1, clause 6.2.2 and DIN EN 295-3, clause 21.2 on the connection of two pipes.

DIN EN 295-1, clause 6.2.2	Test pressure [bar]	Test time [min]	Requirement fulfilled
DN 100-200 : 80mm/m	0.05	5	yes
DN 225-500 : 30mm/m	0.50		yes
DN 600-800 : 20mm/m			
DN > 800 : 10mm/m			

2.7 Water tightness of the pipe joint under shear load according to DIN EN 295-1, clause 6.2.3

Test performed according to EN 295-3, clause 21.3 on the connection of two pipes.

DIN EN 295-1, clause 6.2.3	Shear load [kN]	Test pressure [bar]	Test time [min]	Requirement fulfilled
25 N/mm nominal size in cl. 160	2.5	0.05	15	yes
31.25 N/mm nominal size in cl. 200		0.50		yes
37.5 N/mm nominal size in cl. 240				

2.8 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 ± 5) °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	907.8	928.5	20.7	2.3	≤ 6 %	yes

3 Assessment

Concerning the tested characteristics, the tested vitrified clay pipes **DN 100 x 1000 - System F - 34 kN/m** 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

Materialprüfungsamt MPA NRW 45 Nordrhein-Westfalen

Dipl.-Ing. (FH) Tayyar Uysal
Inspector