

Test report no. 220000631-21-(Sys F)-L-e dated 18.02.2022**Client** **Saudi Vitrified Clay Pipe Co., Ltd.**
P.O. Box 6415

Riyadh 11442
Kingdom of Saudi-Arabia**Manufacturing plants** **Umm Al Quwain Industries LLC.,(Uril)**
P.O. Box 79
Falaj Al Moalla Road
Umm Al Quwain
United Arab Emirates**Surveillance contract 220000631****Underlying specification** Material tests on Lip seal elements made from elastomer of dense structure according to the surveillance contract**Subject of inspection** Lip seal elements made from elastomer of dense structure for pipe joints of vitrified clay pipes – **system F** – according to DIN EN 295-1:2013-05
Lip seal elements DN 100 and DN 150**Surveillance period:** Manufacturing year 2021

Inspection date/date of sampling: 27.11. – 02.12.2021

Receipt of samples: 13.12.2021

Period of testing: 31.01.2022

*The results of the tests refer exclusively to the samples named above.**Test reports may only be published or reproduced without the permission of MPA NRW if unchanged in form and content. The abridged reproduction of a test report requires the consent of MPA NRW.*

This test report consists of 3 pages and 2 enclosures

1. Subject of inspection

Sample designation: Lip seal elements made from elastomer of dense structure for pipe joints of vitrified clay pipes – **system F** –

Manufacturing plant: Umm Al Quwain Industries LLC.,(Uril)

Nominal diameter: DN 110/FN34 und DN 150/FN34

Compound: NR, client's declaration

Drawing-No.: Uril drawing „L-Ring“ dd. 02.05.2012

	Type	System	Material	Diameter nominal	Designation	Manufacturer
Products sampled/ Diameter sampled:	L-ring	F	NR	DN 100	8,9,10	Umm Al Quwain
	L-ring	F	NR	DN 150	11,12,13	

Place of sampling: Client's plant

Place of testing: MPA NRW, Dortmund

Sampling executed by: Employee of MPA NRW

2. Underlying specifications

2.1 Basic underlying

DIN EN 295-1:2013-05 „Vitrified clay pipe systems for drains and sewers - Part 1: Requirements for pipes, fittings and joints"

DIN EN 295-2:2013-05 „Vitrified clay pipe systems for drains and sewers - Part 2: Evaluation of conformity and sampling"

DIN CEN/TR 16626 DIN SPEC 19629:2014-04 „Vitrified clay pipe systems for drains and sewers - Guidance for voluntary third-party certification procedures"

DIN EN 295-3:2012-03 „Vitrified clay pipe systems for drains and sewers - Part 3: Test methods; German version EN 295-3:2012"

DIN EN 681-1:2006-11 „Elastomeric seals – Material requirements for pipe joint seals used in water and drainage applications – Part 1: Vulcanized rubber", type WC

2.2 Storage and handling

DIN ISO 23529:2020-10 „Rubber - General procedures for preparing and conditioning test pieces for physical test methods (ISO 23529:2010)“,
Unless specified deviantly

2.3 Mechanical tests on sealing elements

DIN EN 681-1:2006-11 „Elastomeric seals – Material requirements for pipe joint seals used in water and drainage applications – Part 1: Vulcanized rubber“, type WC

3. Results

The results of tests are stated in **enclosures 1 and 2**.

The results comply with the requirements of the standards as mentioned under point 2.

All results are stated within the scope of the underlying product surveillance contract not considering measurement uncertainties.

Dortmund, den 18. February 2022

By order

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Liratsch

Official in charge

Material properties of sealing elements made from elastomeric material of dense structure

Regular monitoring test for manufacturing period 2021

Designation: Lip seal FN 34 System F
 Manufacturing plant: Umm Al Quwain Industries LLC.,(Uril)
 Compound: NR
 Nominal diameter: DN 100 / FN 34
 Hardness class: 50

Tests and requirements according to DIN EN 681-1:2006-11, table 2 type WA/WC

Property	No. of single values	Unit	Minimum	Maximum	Median	Requirement
Hardness	5	IRHD-M	45	47	46	50 ± 5
Tensile strength	6	MPa	23,7	26,8	25,9	≥ 9
Elongation at break	6	%	531	620	574	≥ 375
Tension set						
72 h, 23°C	3	%	2,6	3,7	2,8	≤ 12
24 h, 70°C	3	%	11,6	12,3	11,7	≤ 20
70 h, -10°C	3	%	15,7	17,4	17,1	≤ 40
Accelerated ageing 7 d 70°C (change of)						
Hardness	5	IRHD-M		+2		-5/+8
Tensile strength	6	%		+1,0		-20
Elongation at break	6	%		-7,1		-30/+10
Stress relaxation in tension (decrease of reset force) *)						
7 d	1	%	7,2	7,2	7,2	≤ 14
(Type test) 100 d	0	%			--	≤ 20
Volume change (water immersion 7 d, 70°C)	3	%	+3,3	+3,8	+3,7	-1/+8
Ozone resistance 50 pphm	3	--	No cracks			No cracks
Strength of spliced joints	0	--	Not applicable			No failure

*) Coefficient of correlation: 1,00

Material properties of sealing elements made from elastomeric material of dense structure

Regular monitoring test for manufacturing period 2021

Designation: Lip seal FN 34 System F
 Manufacturing plant: Umm Al Quwain Industries LLC.,(Uril)
 Compound: NR
 Nominal diameter: DN 150 / FN 34
 Hardness class: 50

Tests and requirements according to DIN EN 681-1:2006-11, table 2 type WA/WC

Property	No. of single values	Unit	Minimum	Maximum	Median	Requirement
Hardness	5	IRHD-M	46	48	47	50 ± 5
Tensile strength	6	MPa	23,6	28,7	26,2	≥ 9
Elongation at break	6	%	550	584	573	≥ 375
Tension set						
72 h, 23°C	3	%	3,1	4,7	3,5	≤ 12
24 h, 70°C	3	%	10,2	13,0	12,3	≤ 20
70 h, -10°C	3	%	14,2	19,7	15,1	≤ 40
Accelerated ageing 7 d 70°C (change of)						
Hardness	5	IRHD-M		+1		-5/+8
Tensile strength	6	%		-18,4		-20
Elongation at break	6	%		-21,8		-30/+10
Stress relaxation in tension (decrease of reset force) *)						
7 d	1	%	7,0	7,0	7,0	≤ 14
(Type test) 100 d	0	%			--	≤ 20
Volume change (water immersion 7 d, 70°C)	3	%	+6,1	+7,8	+6,8	-1/+8
Ozone resistance 50 pphm	3	--	No cracks			No cracks
Strength of spliced joints	0	--	Not applicable			No failure

*) Coefficient of correlation: 0,99