

TEST REPORT: P04022-T03

Gelsenkirchen, 11th November 2011

Customer: Uhrig Kanaltechnik GmbH
Am Roten Kreuz 2
78187 Geisingen

Test no.: P04022

Description of test: Testing of Quick-Lock
Linerend-collars

Description of customer:

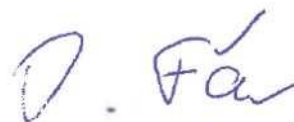
Order date: 9th May 2011

This test report has 7 pages.

The test results refer exclusively to the tested objects. Excerpts from this test report may only be copied with the written consent of the IKT - Institute for Underground Infrastructure gGmbH.



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(Head of Testing)



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(Project manager)

Sample

Sample description			Sample received on	Description of the sample
Seq. no.	IKT (inspection authority)	AG *		
1	H2077-1	.	10.10.11	Quick-Lock Linerend-collar DN 300, final product, L = 250 mm (Figure 2)
2	H2077-2	.	10.10.11	Quick-Lock Linerend-collar DN 300, final product, L = 250 mm (Figure 2)

*Customer

Conducted tests

Number	Test type	Testing procedure	Sample no.	Sample
1	test of resistance to high pressure jet	in accordance with DIN 19523 - procedure 1: material testing [1]	H2077-1 and -2	1,30 m stoneware pipe with hose liner and Quick-Lock Linerend-collars

Illustration of samples:

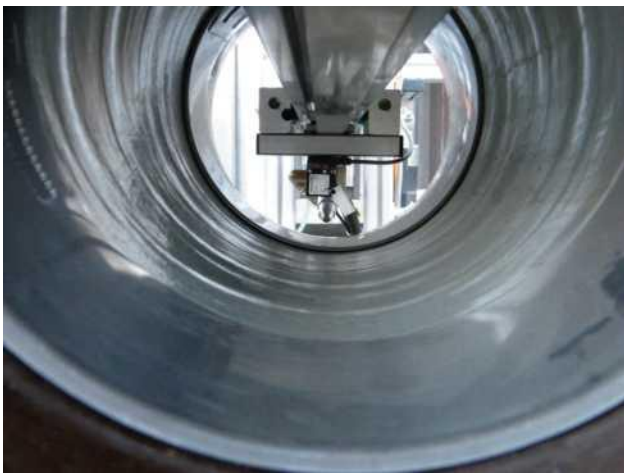


Figure 1: stoneware pipe with installed collars



Figure 2: Quick-Lock Linerend-collars (final product)

Test set-up

Testing of the resistance to high pressure jets according to procedure 1 of DIN 19523 [1] was carried out on October 10th 2011 on the outside area of IKT.

A test nozzle with a ceramic insert and an aperture of 2,5 mm (see figure 3 and figure 4) is moved parallel to the surface of the sample in a distance of 10 (+0/-2) mm.

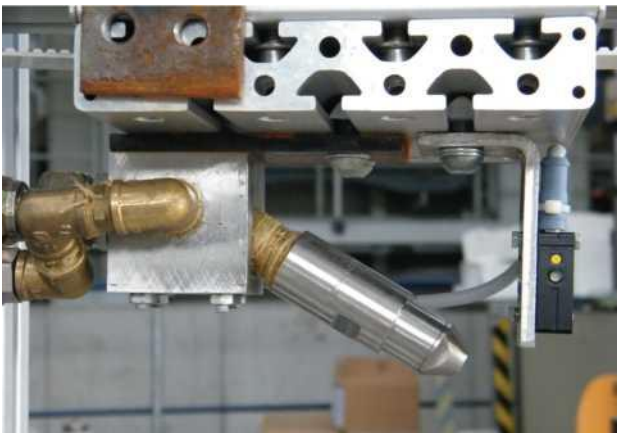


Figure 3: test nozzle

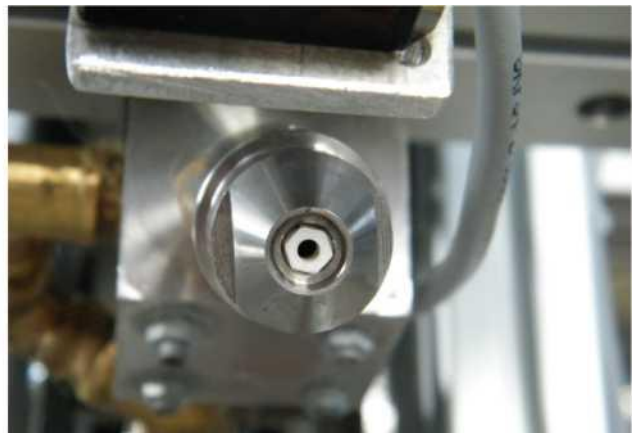


Figure 4: test nozzle insert

According to standards the testing is conducted on 3 test distances, each with 3 test cycles. One test cycle comprises the moving in and moving out of the rinsing head 1,0 m into and out of the sample. Upon completion of each test cycle, the sample is examined visually. The lateral distance between test sections to each other is 10 cm.

Test parameters according to DIN 19523 [1]:

Water temperature and ambient temperature [°C]:	15 ± 10
Spray power density D_j [W/mm ²]:	450 ± 15
Nozzle aperture distance to surface [mm]:	10 +0 -2
Rinsing head angle α [°]:	30 ± 1
Spray diffusion angle ω [°]:	≤ 3,3
Nozzle aperture d [mm]:	2,5 ± 0,02
Specimen length l [cm]:	≥ 130
Velocity in / out [m/min]:	0,2 ± 0,02

The test parameters are controlled and documented via computer throughout testing.

Testing

Compilation if the test parameters during testing:

Water temperature [°C]:	19
Ambient temperature [°C]:	18
Sample length l [cm]:	130

Test distance 1:

Distance of the nozzle aperture on the inner surface of Linerend-collar [mm]: 8,4

Test cycle no.	Flow rate Q [l/min]		c _d - value [-]		Spray power density Dj [W/mm ²]	
	before	after	before	after	before	after
1	35,9	35,8	0,97	0,97	452	447
2	35,8	35,8	0,97	0,97	447	449
3	35,8	35,7	0,97	0,97	447	445

Damage documentation / surface conditions

before testing	smooth, no abnormalities
after test cycle 1	smooth, no abnormalities
after test cycle 2	smooth, no abnormalities
after test cycle 3	smooth, no abnormalities

Note:

After the extension of the Linerend-collars the elastomer seals and their sealing lips also underwent visual check. No abnormalities were identified.



Figure 5: Sealing lips of collar H2077-1, test distance 1



Figure 6: Sealing lips of collar H2077-2, test distance 1

Test distance 2:

Distance of the nozzle aperture on the inner surface of Linerend-collar [mm]: 8,4

Test cycle no.	Flow rate Q		c _d - value		Spray power density Dj	
	[l/min]		[-]		[W/mm ²]	
	before	after	before	after	before	after
1	35,6	35,6	0,97	0,97	441	441
2	35,6	35,5	0,97	0,97	441	438
3	35,5	35,7	0,97	0,97	436	445

Damage documentation / surface conditions

before testing	smooth, no abnormalities
after test cycle 1	smooth, no abnormalities
after test cycle 2	smooth, no abnormalities
after test cycle 3	smooth, no abnormalities

Note:

After removing the Linerend-collars the elastomer seals and their sealing lips also underwent visual check. A minor alteration to the front elastomer seal of collar H2077-1 was observed, the sealing lips did not show any abnormalities. Collar H2077-2 did not show any abnormalities.



Figure 7: Alterations to the elastomer side of the collar H2077-1, test distance 2



Figure 8: Sealing lips of the collar H2077-2, test distance 2

Test distance 3:

Distance nozzle aperture to inner surface of Linerend-collar [mm]: 8,5

Test cycle no.	Flow rate Q		C _d - value		Spray power density Dj	
	[l/min]		[-]		[W/mm ²]	
	before	after	before	after	before	after
1	35,9	35,7	0,97	0,97	451	445
2	35,9	35,8	0,97	0,97	453	449
3	35,7	35,9	0,97	0,97	444	450

Damage documentation / surface characteristics

before testing	smooth, no abnormalities
after test cycle 1	smooth, no abnormalities
after test cycle 2	smooth, no abnormalities
after test cycle 3	smooth, no abnormalities

Note:

After removing the Linerend-collars the elastomer seals and their sealing lips also underwent visual check. A minor alteration to the front elastomer seal of collar H2077-1 was observed, the sealing lips did not show any abnormalities. Collar H2077-2 did not show any abnormalities.

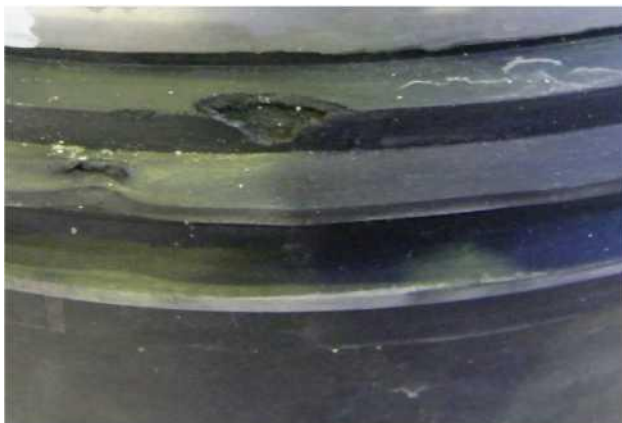


Figure 9: Alterations to the elastomer-side of the collar H2077-1, test distance 3

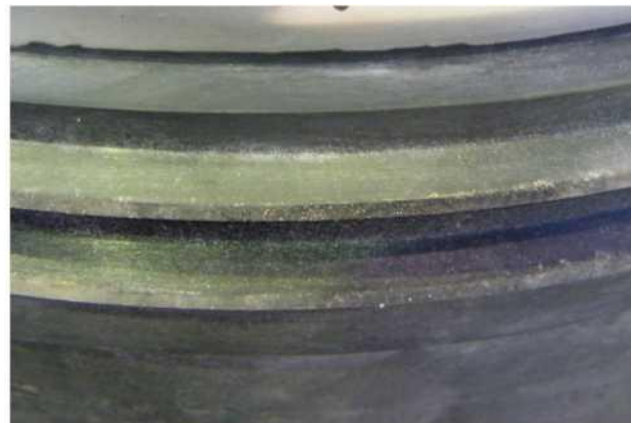


Figure 10: Sealing lips of the collar H2077-2, test distance 3

Results

The inspected Quick-Lock Linerend-collars passed the tests on resistance to high pressure jets, implementing procedures in line with operation 1 of DIN 19523 [1]. In some cases minor alterations to the front end of the elastomer seals outside of the sealing lips were observed, caused by the jet pressure. Due to the extent of the alterations it can be assumed that the sealing effect is not voided. The sealing lips of the specimen did not show any abnormalities.

Literature

- [1] DIN 19523: Requirements and test procedures for testing of resistance to high pressure jets and rinsing devices of pipeline component / sewage conduits (August 2008).