E-07.43-PB 127/2013

TEST CERTIFICATE

Reusability of sealing cushions (valve) coated with swelling material

We hereby certify that the following products, sealing systems of type:

QAK/V
QADE/V
QWAK/V

manufactured by Wolf Kabeltechnik GmbH, 70437 Stuttgart, Germany, and tested on behalf of DOI Seisakusho Co. Ltd., Japan have satisfied the requirements for sealing cable ducts, building service entries and expansion joints against pressing water and gas diffusion on contact with water, in accordance with the following standard:

- France Telecom RSD CSE C75-11H
  Technical Specification – Sealing cable ducts
  Parag. B1-6 Installation and
  Parag. 3.3.2 Ovality test (reusability)

- Deutsche Telekom TS 0307/96 Sealing of cable-configured ducts

The following properties were verified by the certifying body and documented in Test Report No. 127 /2013.

The sealing systems were subjected to type approval testing and quality-controlled by means of batch type testing and fulfil internationally and nationally defined criteria.

The sealing systems are designed and manufactured in such a way that the required tightness of 5 m water column is also fulfilled when the sealing cushion is reused after removal, refurbishment onsite and refitting in accordance with the manufacturer's instructions.

Applicable Test Report:	FO 07 Part 14 PB 179/2011
Date of certification:	25.11.2013
This Test Certificate is valid until	24.11.2015
Certificate No.	

Date: 25.11.2013

fibre optics
CT Consulting & Testing

Kabel-Abdichtsystem
Prüfzertifikat
07.43-PB127/2013
Gültigkeit 24.11.2015

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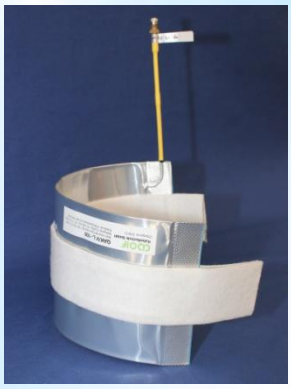
Sealing system



Sealing cushion
16.1 QAK/V L 100

Swelling sealing clip
22.5 QV-ADS 2-4 K40

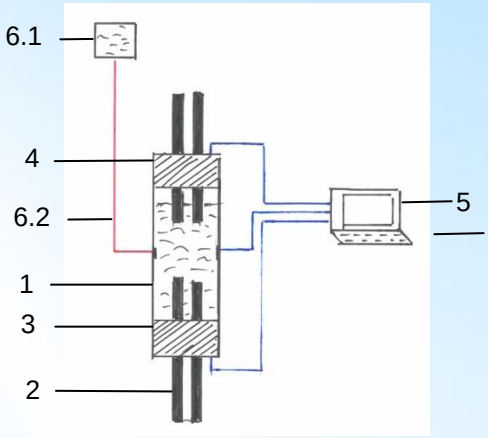
Swelling sealing tape
22.1 QV-DB 4.2x110/10

Requirements for the sealing system

Work stages	Requirements	Test results
1. Reusability (4 times)of the sealing cushion (valve)		
- Non-destructive removal	≤ 5 min	1.5 min
- Onsite refurbishment of the sealing cushion	≤ 5 min	1.5 min
- Fitting in accordance with the brief installation instructions in WO 05 Parts 05.1 and 05.2 - Installation temperature +5°C up to +45°C		20 ±3°C
- Tightness against pressing water in acc. with DIN 18195 Parts 4, 5, 6 and 7	5 m water column after 24 h	5 m water column after ~ 20 min
- Tightness against gas diffusion in acc. with DVGW VP 601	≤ 0.1 bar	≥ 0.2 bar after reduction of initial sealing-cushion pressure up to 1.2 bar

Test setup Testing criteria Reusability

Test setup based on France Telecom ST/FTR CD/764 Parag. 3.2



1 Duct inner Ø 100 mm
2 4 lengths of cable Ø 20-30 mm
3 Sealing cushion 16.1 QAK/V L 100 and sealing clip 22.5 QV-ADS 2-4K 40
4 Sealing cushion 20.6 QADE/V L 100 and sealing tape 22.1 QV-DB 4.2x110/10
5 Measuring PC
6.1 Water container at a height of 3.5 m (0.35 bar)
6.2 Then air-filled under overpressure up to 1.0 bar or 0.5 bar (depending on the requirement)

Removal/ Refurbishment / Reusability after refitting

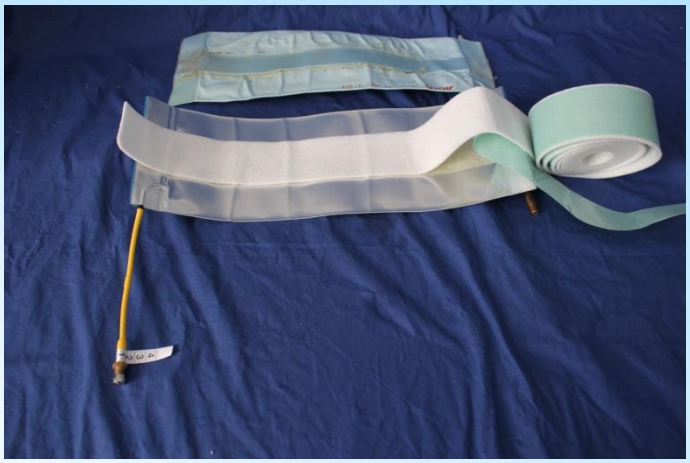
Components

Sealing cushion after non-destructive removal

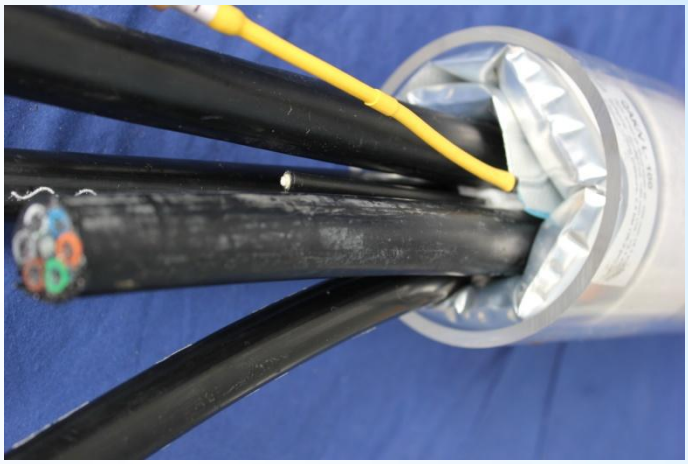
Old QV sealing tapes are removed from the sealing cushion

…/ **Removal/ Refurbishment / Reusability after refitting**

From the roll of sealing tape, cut replacement lengths of Art. No. 22.2 QV-DBK 2.0x60/10 (for outer side of sealing cushion) and 22.2 QV-DBK 4.2x60/10 (for inner side of sealing cushion), and glue these to the sealing cushion.



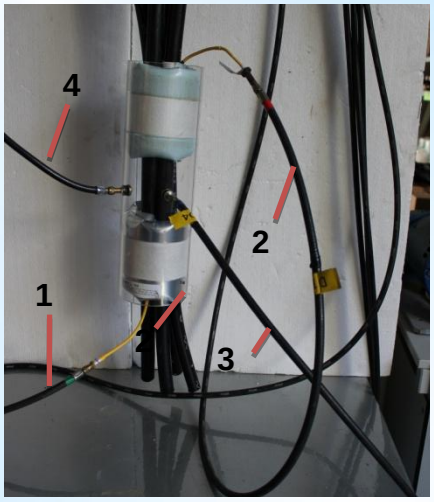
Refitting the sealing cushion Art. No. 16.1 QAK/V L 100 with sealing clip 22.5 QV-ADS 2-4 K40

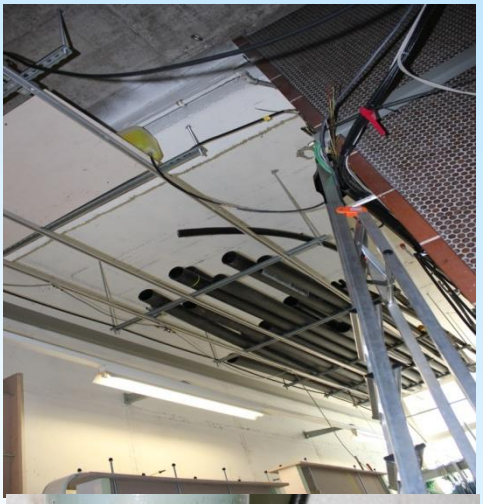


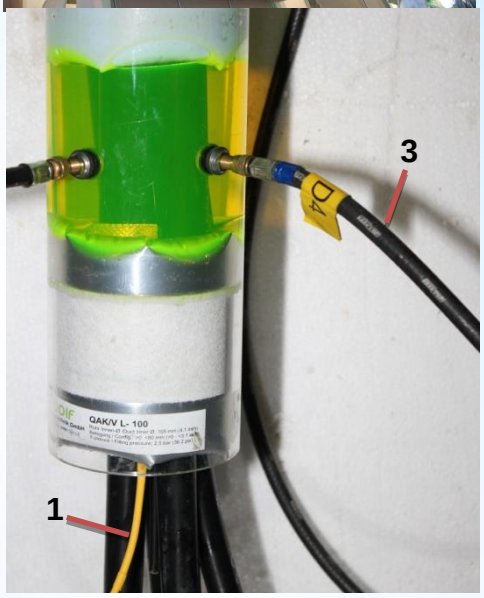
Refitting the sealing cushion Art. No. 20.6. QADE/V L 100 with swelling sealing tape 22.1 QV-DB 2.0x110/10 or 21.1QV-DB 4.2x110/10

Testing procedure and test results

Test setup







1-3 Pressure lines

1 PC Pressure 3 / PB No. 127/2013
QAK/V L 100

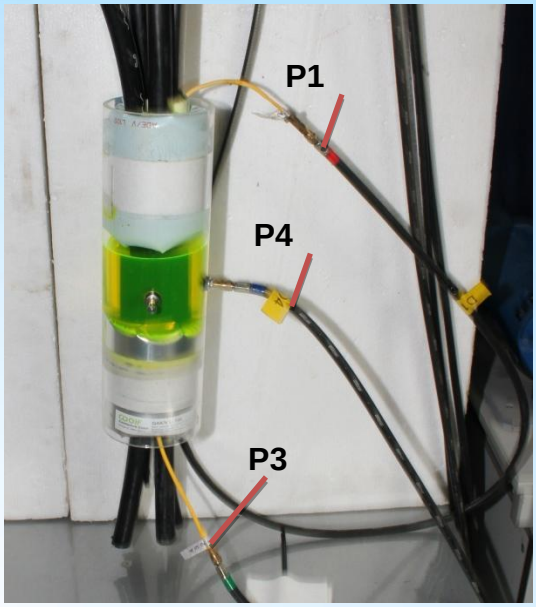
2 PC Pressure 1 / PB No. 127/2013
QADE/V L 100

3 PC Pressure 4
Tight to 5 m water column and
against gas diffusion

4 Inlet for fluorescent water

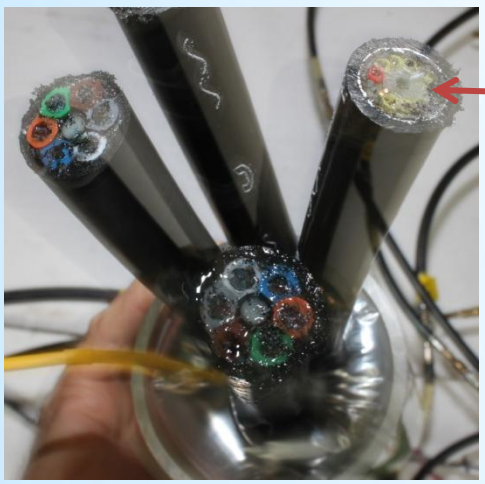
…/ Test results

Pressure 3	The cable seal 16.1 QAK/V L 100 is tight! [Note: Loose-tube filling compound is leaking out of the cable (oil stain)]
Pressure 1	20.6 QADE/VL 100
Pressure 4	Tightness 5 m water column



Full tightness of the cable seal is reached after 10 days.

No fluorescent water can be seen on the swelling material

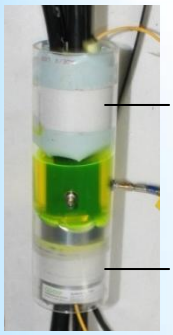


Filling compound leakage

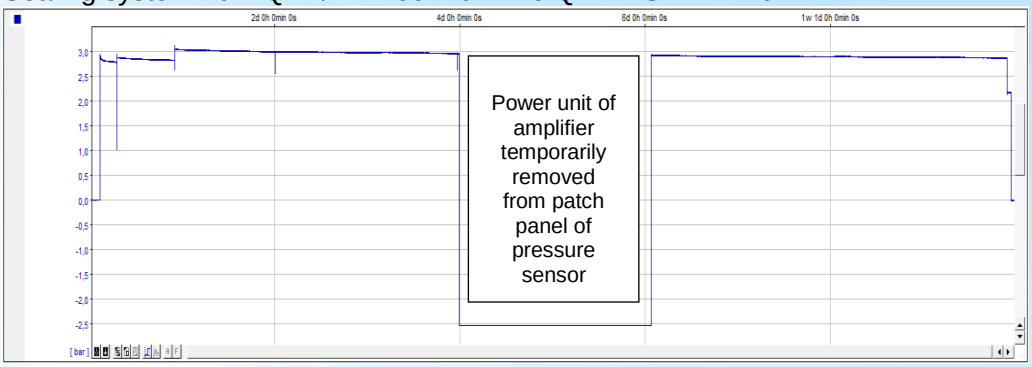
…/ Test results

Sealing cushion – pressure filling:

Protocol
127/2013 P 3.1

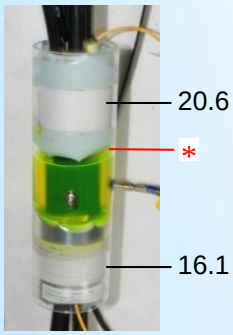


Sealing system 16.1 QAK/V L 100 with 22.5 QV-ADS 2-4 K 40

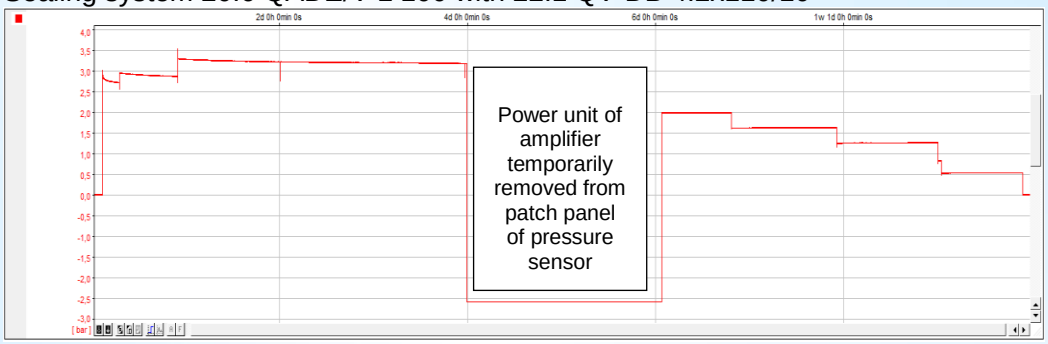


Simulation "Leak rate of sealing cushion with swelling material"

Protocol
127/2013 P 1.1



Sealing system – pressure filling and reduction of cushion overpressure by 0.5 bar/ 24h to 0.5 bar/ cushion overpressure
Sealing system 20.6 QADE/V L 100 with 22.1 QV-DB 4.2x110/10



Results:

The 20.6 QADE/VL sealing cushion was turned through 180° and temporarily soaked with water (for about 20 min)
After this there was no water pressure on the sealing system!
Thus the requirement "tightness against gas diffusion and 5 m water column" was fulfilled.
Specified requirement acc. to DVGW-VP601: gas diffusion ≤ 0.1 bar.

Protocol
127/2013 P 4.1