

04.100-PB 160/2011

TEST CERTIFICATE

Cable Sealing System

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

17.1 UA/V L 80 - 150
17.2 UA-ADS-x/ L 125 - 150
18.1 UA-GE/V L 80 - 250

manufactured by Wolf Kabeltechnik GmbH, 70437 Stuttgart, Germany,

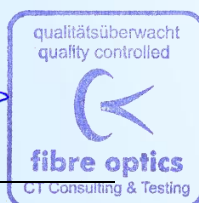
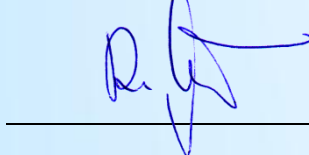
have satisfied the requirements for sealing low and medium voltage and control, signal, earthing and telecommunication cables or ducts against penetration by gas or water, for applications in cable channels and building service entries, in accordance with the following standards:

- DIN VDE 0278-629-1/A1 (May/ June 2007)
Test requirements on accessories for use on power cables of rated voltage from 3.6/ 6 (7.2) KV to 20.8/ 36 (42) KV
- DIN EN 61442 (VDE 0278-442) January 2006
Test methods for accessories for power cables of DIN VDE 0278-629-1/ A1
- Siemens AG Energy Sector
- DVGW Technical rules: test specifications VP 601/ March 2007
Service entries for gas and water supply
- Deutsche Telekom AG T-Com – Technical specification “ADE sealing elements and ADM sealing compounds for occupied cable ducts” TS 307/96 Status 04.10.05
- Fibre Optics CT test specifications FO 17-02 PG 1 to 8.

The sealing systems, which have been tested in co-operation with TÜV-Süd Industrie Service GmbH, subjected to type approval testing (Test Report No. 160/2011) and quality-controlled by means of batch type testing, fulfil internationally and nationally defined criteria. The sealing systems are designed and manufactured so that, with correct professional installation in accordance with the manufacturer's instructions, they will have a service life of at least 20 years. In this context, the water-column pressure resistance must never fall below the value agreed upon by user and manufacturer for longer than 24 h at a time.

Test Report: FO 07 Part 19 PB 160/2011
Date of certification: 12/08/2011
This Test Certificate is valid until 11/09/2013
Certificate No. 160/ 2011

Date: 21/09/2011



Sealing System



Sealing element



Spacer clip (ADS)



Sealing tape

Requirements for sealing elements

Properties	Siemens AG Energy Sector	DVGW 601 Gas and water sect. 4.10.5	Deutsche Telekom TS0307/96	DIN EN 0278-629 A1 ⁽³⁾ 61442 ⁽⁴⁾	Fibre Optics CT tested acc. to FO 17-02...		
					PG1	PG2	PG4
Temperature resistance				Speed of heating and cooling 1°C per min			
T _{A1/t1}	+23°C/ > 7 d						
T _{B1/t1}	-29°C/ > 7 d	-20°C/ ---	-15°C/ 5-25 h	+23 ± 3°C	-40°C/ 6 h		
T _{A2/t1}	+27°C/ 6 h – 7 d		+30°C/ 5-25 h	+85°C/ 4 h ⁽³⁾	+60°C/ 6 h	+60°C/60h	+60°C/60h
T _{B2/t1}	-32°C/ 6 h – 7 d			+23±3°C/4h ⁽³⁾			
T _{A3 momentary}	+36°C/ 6 h	+60°C/ ---		+55°C/ 4 h ⁽⁴⁾			
T _{B3}	-39°C/ 6 h			+23°C / 3 h ⁽⁴⁾			
Cycle duration	-	-	12 h	8 h ⁽³⁾ 8 h ⁽⁴⁾		60 h	60 h
No. of cycles	-	-	20	38 ⁽³⁾ 126 ⁽⁴⁾	16	1	1
Tightness of sealing elements against:			Tightness	≤ 0.35 bar ⁽²⁾	≤ 0.35 bar ⁽²⁾	≤ 0.35 bar ⁽²⁾	≤ 0.35 bar ⁽²⁾
Water ⁽⁵⁾	0,01 bar/ 1h 0.04 bar/ 24 h	----		< 0.1 bar/30min	----	≥ 0.1 bar ≤ 0.25 bar/ 60 min	≤ 0.25 bar/ 60 min
Gas ⁽⁵⁾		0.1 bar/ 30 min	Tightness/ 0.5 bar	-----	----	≥ 0.1 bar ≤ 0.25 bar/ 60 min	
Chemical mixtures pH2, pH12			Tightness 30 d	----	Tightness 30 d	Tightness 30 d	Tightness 30 d
Diesel, petrol, Super petrol ⁽⁵⁾			Tightness 30 d	----	Tightness 30 d	Tightness 30 d	Tightness
Leaking rate, (service life)	---	---	< 4.4 x 10 ⁻⁶ mbarl/sec (138 mbarl/ year)	---	< 5.5 x 10 ⁻⁸ mbarl/sec (2.7 mbarl/ year)		

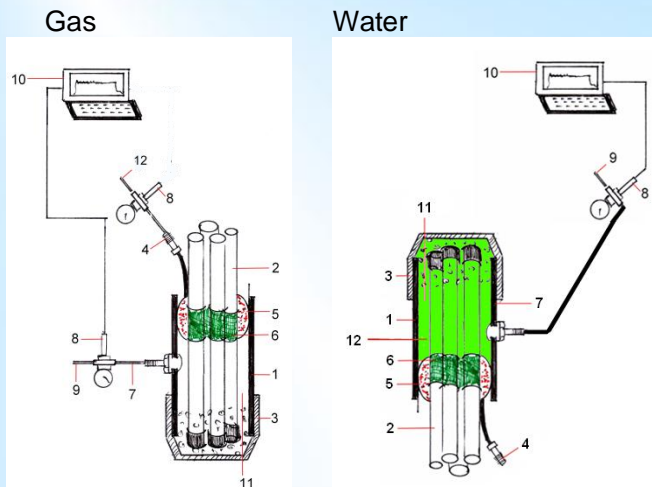
FO testing spec. 17-02 ...
 ... PG1 Tightness of sealing element
 ... PG2 Tightness of cable seal
 ... PG4 Installation/ removal of cable seal (reusability)

(1) Requirement British Telecom
 (2) Pressure loss caused by sealing-element expansion
 (3) Test: heating coil EN 0278-629-1/A1
 (4) Test: Temperature chamber (air circulation) EN 61442
 (5) Temperature area +23°C ± 3°C

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Test setup

Tightness against ...



- 1 Casing pipe
- 2 Cable- / duct bundle
- 3 Heat shrinking cap
- 4 Valve of sealing element
- 5 Sealing element
- 6 Spacer clip (ADS) (for 3 cables) wrapped in elastic sealing tape
Alternatively, all cables wrapped in elastic sealing tape
- 7 Cable/ test duct with pressure valve
- 8 Pressure transmitter
- 9 Pressure filling
- 10 Measuring-PC
- 11 Cables fixed with sealing compound against pulling/ pushing tension
- 12 Water

Test results: Tightness of sealing element

Sample No. 2011/...	Test setup	Dichtigkeit der Abdichtelemente	Tightness: sealing system cable			
			against gas diffusion		against water	
			17 cycles -40°C / 6 h +60°C / 6 h		+60°C / 60 h	
		After	During	During	After	
40	Duct inner Ø 150 mm Art. No. 17.2 UA-ADS-0/V L150 3 medium voltage cables Ø 39 mm 1 ADS spacer clip	0.1	0.3 bar/ 3.5 h (1)	0.2 / 4 h (1)	0.3 bar/ 14.5 h < 1.1 bar/ 4h (1)	
15	Duct inner Ø 150 mm Art. No. 17.1 UA/V L150 22 cables Ø 5 to 24 mm	0.1	0.3 bar/ 3.5 h (1)	0.2 / 4 h (1)	0.4 bar/ 14.5 h < 0.9 bar/ 4h (1)	
16	Duct inner Ø 150 mm Art. No. 17.1 UA/V L150 10 cables/ducts Ø 12 to 40 mm	0.2	<0.8 bar/ 3.4 h (1)	0.2/ 5 h (1)	0.05 bar/ 21 h	
39	Duct inner Ø 150 mm Art. No. 17.2 UA-ADS-0/V L150 3 medium voltage cables Ø 44 mm 1 ADS spacer clip	0.3	<0.9 bar/ 0.1 h (1)	0.1/ 4 h (1)	0.15 bar/ 21.8 h 0.4 bar/ 8 h	
122	Duct inner Ø 80 mm Art. No. 17.1 UA/V L 80 6 cables Ø 7 to 15,5 mm 1 ADS spacer clip	0.3	1.0 bar/ 3.6 h (1)	0.4/ 10 h (1)	0.25 bar/ 21.8 h < 0.6 bar/ 12 h	
	Required (bar filling pressure):	≤0.35	>0.1 ≤0.25	>0.1 <0.25	>0.1 <0.25	
	Test duration:	17 cycles	> 60 min	≥ 60 min		
	Result:	Requirements fulfilled (1)				

(1) Limited tightness of heat shrinking caps [test setup (3)] against filling pressure under temperature stress

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FO 7 Part 19

Test Report No.: PB 160/ 2011

Atmospheric temperature cycling-
Resistance of sealing elements (valve)
in occupied building service entries
during atmospheric temperature
fluctuation from -40°C to +60°C

Product: reusable sealing system (valve), types
17.1 UA/V L 80 – 150
17.2 UA-ADS-x/ L 125 – 150
18.1 UA-GE/V L 80 - 250

Applications: Sealing of low and medium voltage and control, signal, earthing and telecommunication cables or ducts against penetration by gas or water, for applications in cable channels and service entries in buildings.

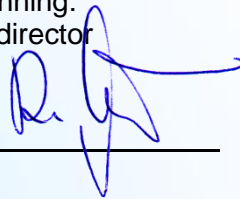
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Fibre Optics CT test specifications

Stuttgart, 07/10/2011

Fibre Optics CT GmbH
Zazenhäuser Str. 52
70437 Stuttgart
Germany

Project planning:
Managing director



Mechanical and dynamic
measuring technology:



Process
& dynam

The random check inspections of testing and measuring were carried out by TÜV SÜD Industrie Service GmbH on.

12/07/2011
21/07/2011
25/07/2011
12/08/2011