

Kiwa GmbH, Finkenweg 7, 86368 Gersthofen

Hauff-Technik GmbH & Co. KG  
Robert-Bosch-Straße 9  
89428 Hermaringen

Kiwa GmbH  
Bautest Augsburg  
Finkenweg 7  
86368 Gersthofen

T: +49 (0) 821 72024 - 0  
F: +49 (0) 821 72024 - 40  
E: [Infokiwaugsburg@kiwa.de](mailto:Infokiwaugsburg@kiwa.de)

[www.kiwa.de](http://www.kiwa.de)

Project / Plant: Water tightness test of the universal wall sleeve with integrated patch flange Hauff UFR 150 cast in a concrete test block with exterior waterproofing PCI Pecimor 2K (waterproofing class W2.1E according to DIN 18533-1)

Order date: 19 June 2018

Product description: Universal wall sleeve with integrated patch flange Hauff UFR 150

Order: Water tightness test  $\geq 1,0$  bar for 28 days

Number of samples / tests: 1 test

Sampling: on: - / by: Applicant

Date of delivery: 19 June 2018

Testing period: 20 June - 18 July 2018

Contact: B. Eng. David Röck  
Tel. +49 821 72024-14

Number of annexes: The test report contains 1 annex

Remark: Translation of Test Report A1842048-01,  
30 July 2018

Gersthofen, 30 July 2018  
dö/rö

p. p.



B. Eng. David Röck  
- Project manager -



p. p.



Dipl.-Ing. (FH) Kerstin Schedl  
- Project manager -

The test results relate only on the items tested. Without the written approval of the testing laboratory, a duplication in extracts of the test report is not permitted.

Geschäftsführer: Prof. Dr. Roland Hüttl

Amtsgericht Hamburg, HRB 130568, St.Nr.: 46/736/03268



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## 1. General

Kiwa GmbH, Bautest Augsburg, was contracted by Hauff-Technik GmbH & Co. KG to test the water tightness of the universal wall sleeve with integrated patch flange Hauff UFR 150 [1] cast in a concrete test block with the exterior waterproofing PCI Pecimor 2K (waterproofing class W2.1E according to DIN 18533-1 [2] and DIN 18533-3 [3]).

Therefore Hauff-Technik GmbH & Co. KG delivered the concrete test block with a universal wall sleeve with integrated patch flange Hauff UFR 150 together with the components for the test setup to our test laboratory in Gersthofen, Germany. The surface of the test block which was charged with water pressure was already finished with the exterior waterproofing polymer modified bituminous coating (PMBC) PCI Pecimor 2K [4] according to DIN EN 15814 [5]. The assembly of the test setup was performed by an employee of Hauff-Technik GmbH & Co. KG (see Figure 1).

To test exclusively the sealing function between the PMBC and the universal wall sleeve with integrated patch flange Hauff UFR 150, a hook-and-loop tape was glued on the outer side of the wall sleeve and the underside of the patch flange to create a gap for possibly penetrating water (Figure 2).

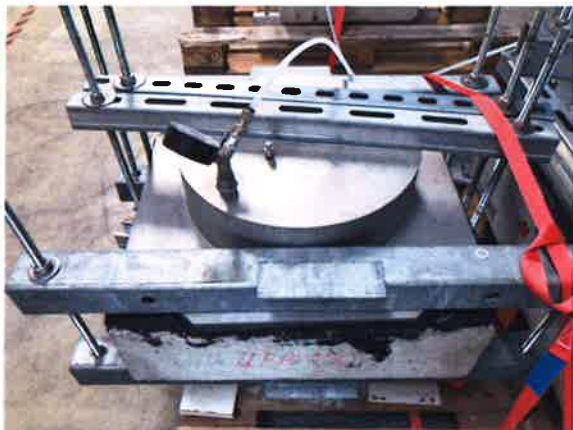


Figure 1. Assembled test setup.

## 2. References

- [1] Hauff-Technik GmbH & Co. KG - „Assembly instruction – Plastic wall sleeve with intergrated patch flange UFR 100/150/200/X“. Version ma\_ufr\_de\_en\_151118.
- [2] DIN 18533-1. Waterproofing of elements in contact with soil. Part 1: Requirements and principles for design and execution. Edition July 2017.
- [3] DIN 18533-3. Waterproofing of elements in contact with soil. Part 3: Waterproofing with liquid-applied waterproofing materials. Edition July 2017.
- [4] PCI technical data sheet 302 - „Bitumen thick coating PCI Pecimor® for external basement walls and foundations. Edition December 2017.
- [5] DIN EN 15814. Polymer modified bituminous thick coatings for waterproofing - Definitions and requirements. Edition March 2015.
- [6] WIKAPolska sp. z o.o. sp. k. - “Inspection certificate according to EN 10204 - 3.1. Certification No. WC006949. Edition 19 March 2018”.

### 3. Test procedure

#### 3.1 Test preparation (Hauff Technik GmbH & Co. KG)

The assembly of the test setup was performed by the manufacturer (Hauff-Technik GmbH & Co. KG) of the universal wall sleeve at Kiwa GmbH in Gersthofen, Germany. According to information given by the manufacturer the test setup was assembled as follows:

The universal wall sleeve with integrated patch flange Hauff UFR 150 (without water barrier flange) and the hook-and-loop tape on the outer side was cast in the middle of the concrete test block with the dimensions (l x w x h) 500 x 500 x 150 mm according to the manufacturer installation instruction [1].

After hardening of the concrete test block the uncast surface of the concrete test block was levelled and cleaned.

The surface of the test block which was charged with water pressure (this corresponds to the outside of a building) was treated with two layers of the PMBC PCI Pecimor 2K [4] according to DIN EN 15814 [5] to create an exterior waterproofing.

The opening of the universal wall sleeve with integrated patch flange Hauff UFR 150 was closed with a blind plug.

Afterwards Hauff Technik GmbH & Co. KG attached a pressure bell with manometer above the sealing system. The sealing of the pressure bell was performed with the help of an EPDM sealing and clamping pressure.



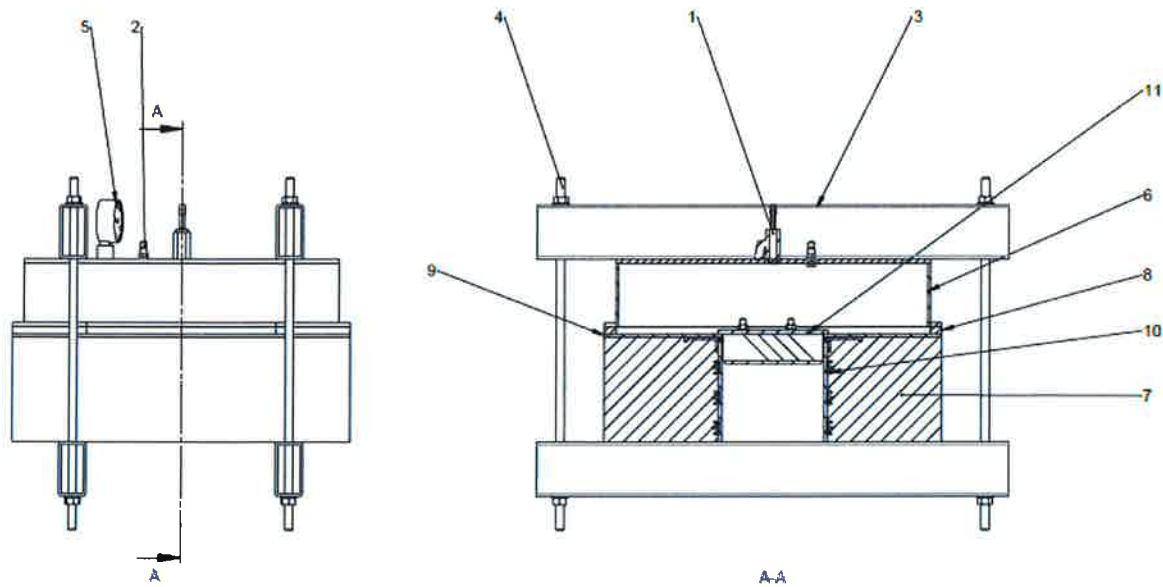
Figure 2. The hook-and-loop tape on the outer side of the wall sleeve and the underside of the patch flange.

#### 3.2 Water tightness test (Kiwa GmbH)

The test setup which was assembled by Hauff-Technik GmbH & Co. KG was built up in accordance to Section 3.1 with one manometer (see Figure 3).

A calibration of the assembled manometer (serial no. 5400TD8M [6]) was performed by WIKA Polska sp. z o.o. sp. k. (see Section 6).

After prior consultation with the manufacturer the test of the water tightness with permanently attached water pressure was performed with  $\geq 1,0$  bar for 28 days.



Position	Designation
1	Stop valve
2	Air bleed valve
3	Security bar
4	Threadad rod M12 with nut and washer
5	Pressure gauge manometer
6	Test cylinder
7	Concrete test member
8	EPDM sealing
9	Polymer modified bituminous coating (PMBC)
10	Universal wall sleeve UFR 150
11	Blind plug

Figure 3. Detail of the test setup - manufacturer's drawing.

#### 4. Test results

During the water tightness test no pressure drop as a result of leakages was detected (see Table 1). The test results can be seen at Figure A1 and Figure A2 attached in the annex.

Table 1. Results of the water tightness test.

Test specimen	Water pressure at the beginning of testing [bar]	Water pressure at the end of testing [bar]	Testing period [d]	Remark
UFR 150	≥ 1,0	≥ 1,0	28	No pressure drop as a result of leakages

## 5. Summary

*During the water tightness test of the universal wall sleeve with integrated patch flange Hauff UFR 150 which was cast in a concrete test block with exterior waterproofing PMBC PCI Pecimor 2K according to DIN EN 15814 no pressure drop as a result of leakages was detected during the testing period of 28 days with a permanent attached water pressure of  $\geq 1,0$  bar.*

## 6. Calibration certificate

447H

Wika Polska sp. z o.o. sp. k.

Inspection certificate according to EN 10204 - 3.1  
Abnahmeprüfzeugnis nach EN 10204 - 3.1



Customer: Kunde:	Hauff-Technik GmbH & Co. KG Robert-Bosch-Straße 9 Herrmaringen 89568 DE	Page Seite	1 / 2
		Certificate No Zeugnis-Nr	WC006949
		Date Datum	19.03.2018
Customer Order No. Kundenbestellnummer	175211375	Customer Part. No. Kunden Artikel-Nr.	Order Date Bestelldatum
Order No. / Item Auftrags-Nr. / Pos	22668960/2 32210713	Part No. Artikel-Nr.	14225186
Model Typ	111 10.083	Serial number Seriennummer	5400TD8M
Class Klasse	2,50 %	Tag No. Messstellen-Nr.	Scale range Anzegebereich
Reference Referenzgerät	CPG2500 0,01% -1 2.7 bar rel	Calibration No. Kalibrier Nummer	SW-102-1-17 WPL 17-04
Article text Artikeltext	Bourdon tube pressure gauges, model 111		

Wika Polska sp. z o.o. sp. k.

Inspection certificate according to EN 10204 - 3.1  
Abnahmeprüfzeugnis nach EN 10204 - 3.1



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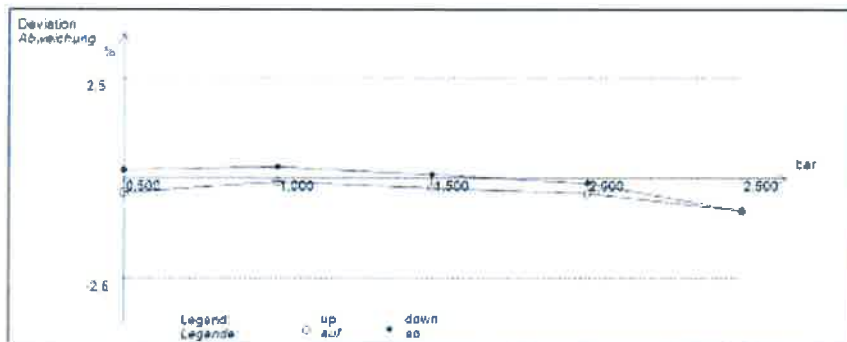
Customer: Hauff Technik GmbH & Co. KG  
Kunde: Robert Bosch-Straße 9  
Hermlingen  
89568  
DE

Certificate No. WCC08949  
Zeugnis-Nr.

Date 19.03.2018  
Datum

Result Temperature  
Ergebnis Temperatur 20°C +/- 5 K

Test Item Prüfung bar	Standard Referenz bar	Measured Mittelwert bar	rel. Deviation rel. Abweichung bar	Deviation Abweichung %	Hysteresis Hysterese %
0.500	0.508	0.494	0.502	-0.002	-0.06
1.000	1.002	0.993	0.997	-0.003	0.16
1.500	1.506	1.498	1.502	-0.002	-0.07
2.000	2.008	2.003	2.006	-0.006	-0.24
2.500	2.520	2.520	2.520	-0.020	0.00



Object keeps the specification.  
Der Kalibriergegenstand hält die Fehlergrenzen nach Herstellerangaben ein.

Calibration was carried out according to the following norm: DIN EN 837-1  
Die Kalibrierung erfolgte auf der Grundlage der folgenden Norm:

Remarks / Bemerkung

Inspection Representative / Abnahmebeauftragter: Daniel Koltewski  
Examiner / Prüfer: S. Piekarski

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Wika Polska sp. z o.o. sp. k.  
ul. Legska 29/35  
87-800 Wroclawek  
Polska

Tel: +48 54 23-01-100  
Fax: +48 54 23-01-101  
info@wikaopolska.pl  
www.wikaopolska.pl





Figure A1. Water tightness test with  $\geq 1,0$  bar water filled test cylinder (manometer at the beginning of testing on 20.06.2018).



Figure A2. Water tightness test with  $\geq 1,0$  bar water filled test cylinder (manometer after 28 days on 18.07.2018).