

Test report no. A1942032-01 (eng)



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Project / Plant: Water tightness test of the single wall insert Hauff HSI150-K-AF

Order date: 11 June 2019

Product description: Single wall insert Hauff HSI150-K-AF embedded in a concrete test block with an exterior waterproofing polymer modified bituminous coating (PMBC) according to DIN EN 15814 (waterproofing class W2.1E according to DIN 18533-1)

Order: Water tightness test with  $\geq 1,0$  bar for 28 days,  $\geq 1,5$  bar for 1 day,  $\geq 2,0$  bar for 1 day and  $\geq 2,5$  bar for 10 days

Number of samples / tests: 4 tests

Sampling: on: - / by: Applicant

Date of delivery: 12 June 2019

Testing period: 17 June - 29 July 2019

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

Remark: Translation of Test Report A1942032-01,  
8 August 2019

Gersthofen, 8 August 2019

dö/rö

p. p.

B. Eng. David Röck  
- Project manager -



p. p.

Jörg Bölzle  
- Project manager -

The test results relate only on the items tested. Without the written approval of the testing laboratory, a duplication 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 single wall insert Hauff HSI150-K-AF [1] embedded in a concrete test block with concrete strength C20/25 with an exterior waterproofing polymer modified bituminous coating (PMBC) according to DIN EN 15814 [2] (waterproofing class W2.1E according to DIN 18533-1) [3] - [6].

Therefore Hauff-Technik GmbH & Co. KG delivered a test block with the exterior waterproofing polymer modified bituminous coating (PMBC) PCI Pecimor 2K [7] according to DIN EN 15814 [2] and already installed single wall insert Hauff HSI150-K-AF as well as the necessary components for the test to our test laboratory in Gersthofen, Germany. The assembly of the test setup was performed by an employee of Hauff-Technik GmbH & Co. KG (see Figure 1).



Figure 1. Test setup – complete system.

## 2. References

- [1] Hauff-Technik GmbH & Co. KG - „Installation Instruction HSI 90/HSI 150“, ma\_HSI\_90\_150 so\_wird\_einbetoniert\_151202“.
- [2] DIN EN 15814. Polymer modified bituminous thick coatings for waterproofing - Definitions and requirements. Edition March 2015.
- [3] DIN 18533-1. Waterproofing of elements in contact with soil. Part 1: Requirements and principles for design and execution. Edition July 2017.
- [4] DIN 18533-1/A1. Waterproofing of elements in contact with soil. Part 1: Requirements and principles for design and execution; Amendment A1. Edition September 2018.
- [5] DIN 18533-3. Waterproofing of elements in contact with soil. Part 3: Waterproofing with liquid-applied waterproofing materials. Edition July 2017.
- [6] DIN 18533-3/A1. Waterproofing of elements in contact with soil. Part 3: Waterproofing with liquid-applied waterproofing materials; Amendment A1. Edition September 2018.
- [7] PCI technical data sheet 302 - „Bitumen thick coating PCI Pecimor® for external basement walls and foundations. Edition May 2018.
- [8] WIK A Polska sp. z o.o. sp. k. - “Inspection certificate according to EN 10204 - 3.1. Order No. 22666960/2.

### **3. Test procedure**

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

According to information given by the manufacturer the test setup was assembled by Hauff-Technik GmbH & Co. KG as follows:

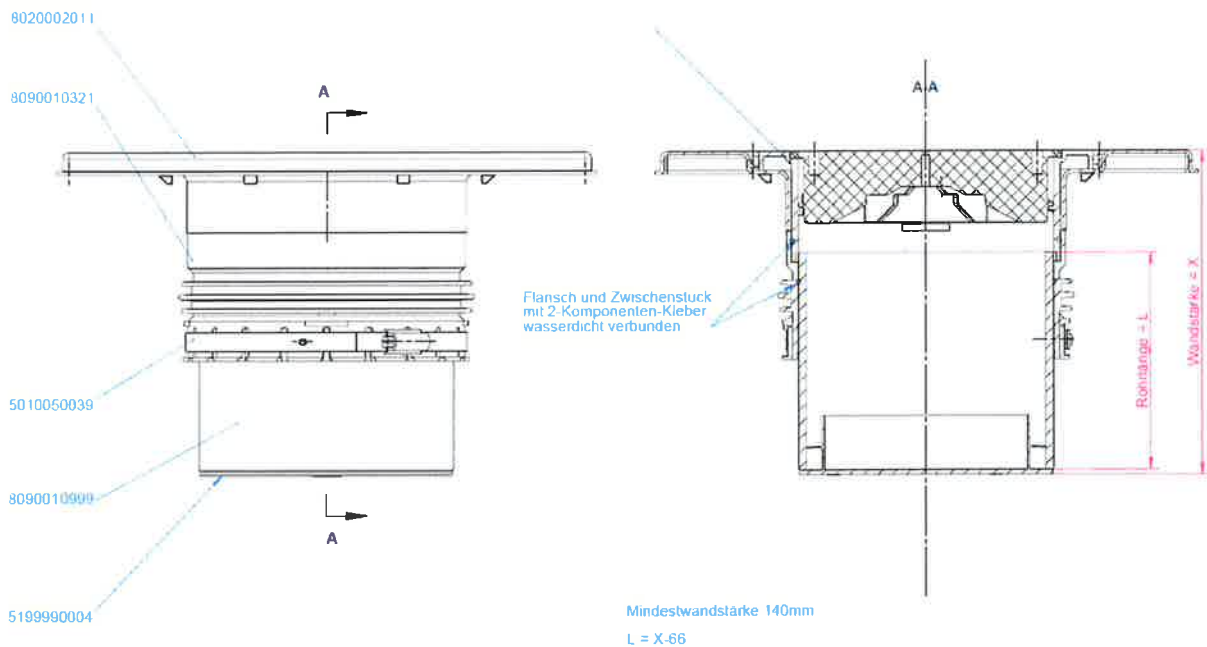
The patch flange of the single wall insert Hauff HSI150-K-AF (see Figure 2) was positioned and nailed on the timber formwork of the concrete test block (corresponds to the building exterior wall). After closing the formwork, the single wall insert was cast in layers and the concrete was compacted.

After hardening of the concrete test block the formwork was removed and the concrete surface at the side of the patch flange (corresponds to the building exterior wall) was burnished and cleaned.

Subsequently, two layers of the polymer modified bituminous coating (PMBC) PCI Pecimor 2K [7] according to DIN EN 15814 [2] were applied on this surface of the concrete test block as an exterior waterproofing.

After hardening of the PMBC a split system cover Hauff HSI150 DG-6/10-36 was installed and closed with blind covers.

Finally, a stainless steel cover plate with pressure reducer and calibrated manometers (see Chapter 6) was positioned over the patch flange of the single wall insert and fixed with tension rods. The sealing of the cover plate was performed with the help of an EPDM plate and clamping pressure.



Pos.	Designation
8020002011	Integrated patch flange
8090010321	Length adjustment short version
5010050039	Clamping strap $\varnothing 160\text{-}\varnothing 180\text{mm}$
8090010999	PVC pipe $\varnothing 160 \times 4,7$
5199990004	Lamella plug 159mm, black

Figure 2. Single wall insert Hauff HSI150-K-AF - manufacturer's drawing.

### 3.2 Water tightness test (Kiwa GmbH, Bautest Augsburg)

The test setup 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. 5400TD8B [8]) was performed by WIKA Polska sp. z o.o. sp. k. (see Chapter 6).

After prior consultation with the manufacturer the test of the water tightness with permanently attached water pressure was performed as follows:

- ≥ 1,0 bar for 28 days
- ≥ 1,5 bar for 1 day
- ≥ 2,0 bar for 1 day
- ≥ 2,5 bar for 10 days.

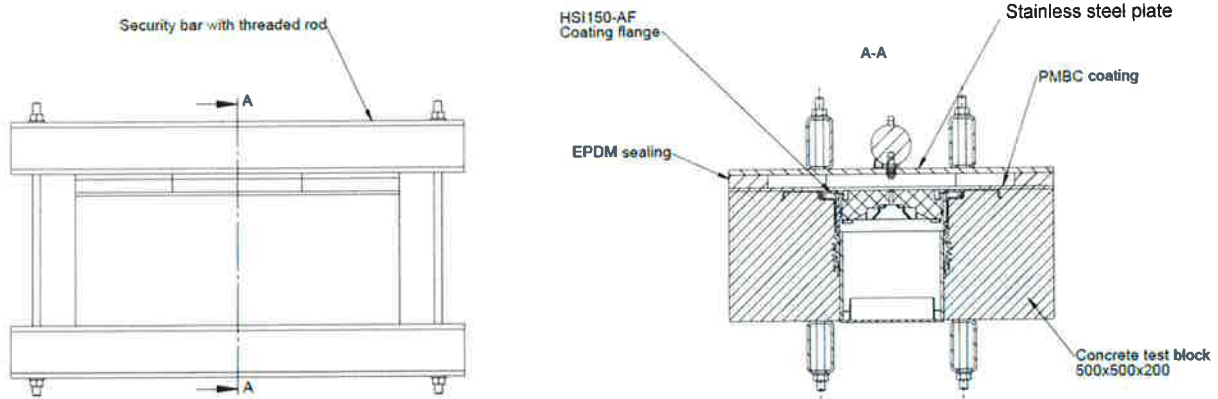


Figure 3. Detail of the test setup - manufacturer's drawing.

#### 4. Test results

During the water tightness tests no leakages were detected at the system (see Table 1).

Table 1. Results of the water tightness tests.

Test specimen	Water pressure at the beginning of testing [bar]	Water pressure at the end of testing [bar]	Testing period [d]	Remark
Single wall insert Hauff HSI150-AF	≥ 1,0	≥ 1,0	28	No leakages were detected at the system
	≥ 1,5	≥ 1,5	1	
	≥ 2,0	≥ 2,0	1	
	≥ 2,5	≥ 2,5	10	

#### 5. Summary

During the water tightness tests of the single wall insert Hauff HSI150-K-AF, embedded in a concrete test block with an exterior waterproofing polymer modified bituminous coating (PMBC) according to DIN EN 15814 (waterproofing class W2.1E according to DIN 18533-1), no leakages at the system were detected at ≥ 1,0 bar for 28 days, ≥ 1,5 bar for 1 day, ≥ 2,0 bar for 1 day and ≥ 2,5 bar for 10 days.

## 6. Calibration certificates

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  
Kunde Hauff-Technik GmbH & Co. KG  
Robert-Bosch-Straße 9  
Hermaringen  
89568  
DE

Certificate No  
Zeugnis-Nr WC006960

Date  
Datum 2018-03-20

Customer Order No Kundenbestellnummer	175211375	Customer Part No Kunden Artikel-Nr	Order Date Bestelldatum
Order No / Item Auftrags Nr. / Pos	22666960/3 32210715	Part No Artikel-Nr	14225187
Model Typ	111 10.083	Serial number Seriennummer	5400TD88
Class Klasse	2,50 %	Tag No Messstellen-Nr	Scale range Anzeigebereich 0 6 bar rel

Reference  
Referenzgerät  
CPG2500 0.01% IS-50 1 32 1 bar rel

Calibration No  
Kalibriernummer  
SW-101-1-17 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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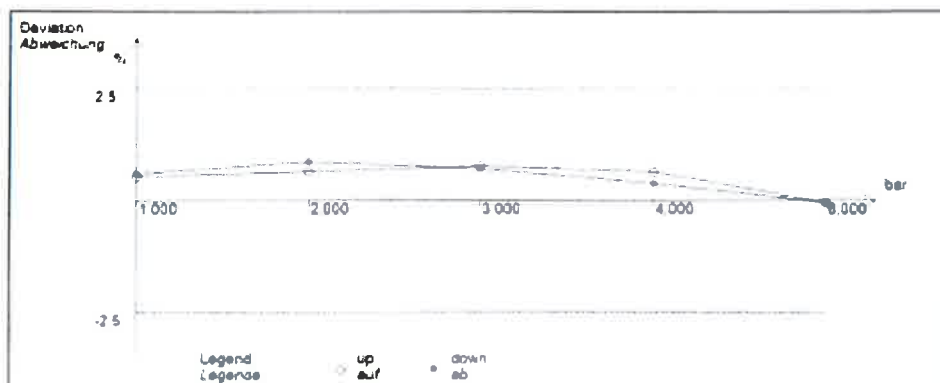
Customer: Hauff Technik GmbH & Co. KG  
 Kunde: Robert-Bosch Straße 9  
 Hermingen 89568 DE

Certificate No: WCC006960  
 Zeugnis Nr

Date: 2018-03-20  
 Datum

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

Test Item Prüfung bar	Standard Referenz bar	Minimum Mindestwert bar	Max. Deviation max. Abweichung bar	Deviation Abweichung %	Hysteresis Hysterese %
1 000	0 959	0 964	0 957	0 033	0 55
2 000	1 961	1 948	1 955	0 045	0 75
3 000	2 954	2 957	2 958	0 044	0 74
4 000	3 962	3 977	3 969	0 031	0 51
6 000	6 002	6 002	6 002	-0 002	-0 04



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

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

Remarks / Bemerkung

Inspection Representative: Daniel Kotlewski  
 Abnahmebeauftragter: Daniel Kotlewski  
 Examiner: J. Glodowski  
 Prüfer

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