

Test Report no. A1742019-01a (eng)  
Replacement for  
Test Report no. A17402019-01



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**Project / Plant:** Water tightness test of the universal building entry MIS60-Dig with membrane injection system, installed in a test block with 60 mm core drill and exterior waterproofing PCI Pecimor 2K (waterproofing class W2.1E according to DIN 18533-1)

**Order date:** 22 November 2017

**Product description:** Universal building entry Hauff MIS60-Dig with membrane injection system

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

**Number of samples / tests:** 1 test

**Sampling:** on: - / by: Applicant

**Date of delivery:** 22 November 2017

**Testing period:** 22 November - 20 December 2017

**Contact:** B. Eng. David Röck  
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**Number of annexes:** The test report contains 1 annex

**Remark:** Translation of Test Report A1742019-01a,  
3 July 2018

Gersthofen, 3 July 2018  
rö/c

p. p.

Dr.-Ing. Massimo Sosoro  
- Technical director -



p. p.

B.Eng. David Röck  
- 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



## CONTENTS

	Page
<b>1. General</b> .....	<b>3</b>
<b>2. References</b> .....	<b>3</b>
<b>3. Test procedure</b> .....	<b>4</b>
3.1 Test preparation (Hauff Technik GmbH & Co. KG) .....	4
3.2 Water tightness test (Kiwa GmbH).....	5
<b>4. Test results</b> .....	<b>6</b>
<b>5. Summary</b> .....	<b>7</b>
<b>6. Calibration certificate</b> .....	<b>8</b>

## 1. General

Kiwa GmbH, Bautest Augsburg, was contracted by Hauff-Technik GmbH & Co. KG to test the water tightness of the universal building entry Hauff MIS60-Dig with membrane injection system [1], installed in a test block with 60 mm core drill and the exterior waterproofing polymer modified bituminous coating (PMBC) 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 the already installed universal building entry Hauff MIS60-Dig 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 MIS60-Dig the injection of the expansion resin into the universal building entry was not performed.

Compared to the Kiwa GmbH Test Report no. A1742019-01 (eng), dated 11 June 2018, this test report contains the correction that the universal building entry Hauff MIS60-Dig was installed into a core drill instead of a wall sleeve.



Figure 1. Assembled test setup.

## 2. References

- [1] Hauff-Technik GmbH & Co. KG - „Assembly instruction - MIS60-Dig/6-34, 3x10 or 4x5-7“. Version ma\_mis60\_dig\_160223.
- [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 August 2017.
- [5] DIN EN 15814. Polymer modified bituminous thick coatings for waterproofing - Definitions and requirements. Edition March 2015.

- [6] WIKA Alexander Wiegand SE & CO. KG - "Inspection certificate according to EN 10204 - 3.1. Order No. 22392920/3".

### 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 building entry at Kiwa GmbH in Gersthofen, Germany. According to information given by the manufacturer the test setup was assembled as follows:

A core drill  $\varnothing 60$  mm was placed through the middle of a test block with concrete strength C20/25.

The surface of the concrete 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.

After hardening of the PMBC the universal building entry Hauff MIS60-Dig was inserted into the core drill through the side of the test block which was charged with water pressure (see Figure 2 - left). Then the protective foil of the butyl tape at the rubber flange was removed (see Figure 2 - right) and the universal building entry was slightly pushed against the concrete surface.

Subsequently the slack quick tensioning device was pushed over the universal building entry through the side of the test block which was not charged with water pressure (see Figure 3 - left), the nozzle was inserted in the core drill and it was fixed with the vertical screw (see Figure 3 - right).

After sealing the universal building entry with the dummy insert "MIS60 4 x  $\varnothing 5$  -  $\varnothing 7$ " at the side of the test block which was charged with water pressure, 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. Inserting the universal building entry Hauff MIS60-Dig into the core drill (left) and removing the protective foil of the butyl tape at the rubber flange (right) (pictures of the manufacturer).



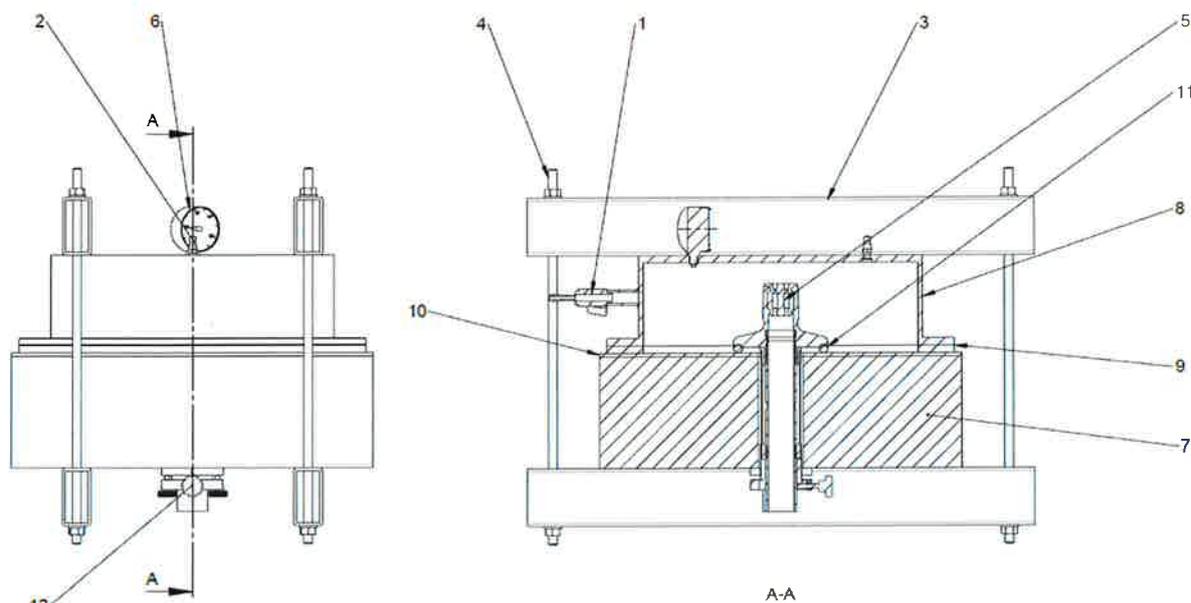
Figure 3. Pushing the slack quick tensioning device over the universal building entry (left) and fixing it with the vertical screw (right) (pictures of the manufacturer).

### 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 4).

A calibration of the assembled manometer (serial no. 54604156 [6]) was performed by WIKA Alexander Wiegand SE & Co. KG (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	threaded bolt M12 with shim and nut
5	dummy insert "MIS60 4 x Ø5 - Ø7"
6	pressure gauge manometer
7	touchstone
8	test cylinder
9	test cylinder seal
10	polymer modified bituminous coating (PMBC)
11	membrane injection system "MIS60"
12	quick tensioning device "MIS60"

Figure 4. 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
MIS60-Dig	≥ 1,0	≥ 1,0	28	no pressure drop as a result of leakages

## 5. Summary

*During the water tightness test of the universal building entry Hauff MIS60-Dig with membrane injection system which was installed in a concrete test block with a core drill and the exterior water-proofing 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

Wika Polska sp. z o.o. sp. k.  
 Inspection certificate according to EN 10204 - 3 1  
 Abnahmeprüfzeugnis nach EN 10204 - 3 1



Page 1 / 2  
 Seite

Customer  
 Kunde  
 Mauff-Technik GmbH & Co. KG  
 Robert-Bosch-Straße 9  
 Harmeringen  
 89568  
 DE

Certificate No.  
 Zeugnis-Nr  
 WC003005

Date  
 Datum  
 2017-05-05

Customer Order No.  
 Kundenbestellnummer  
 175202179

Customer Part No.  
 Kunden Artikel-Nr.  
 Order Date  
 Bestelldatum  
 2017-03-23

Order No. / Item  
 Auftrags-Nr. / Pos.  
 22392920v3  
 31977549

Part No.  
 Artikel-Nr.  
 14225187

Serial number  
 Seriennummer  
 54604158

Scale range  
 Anzeigebereich  
 0 ... 6 bar ref

Model  
 Typ  
 111 10.053

Class  
 Klasse  
 2,50 %

Tag No.  
 Messstellen-Nr.

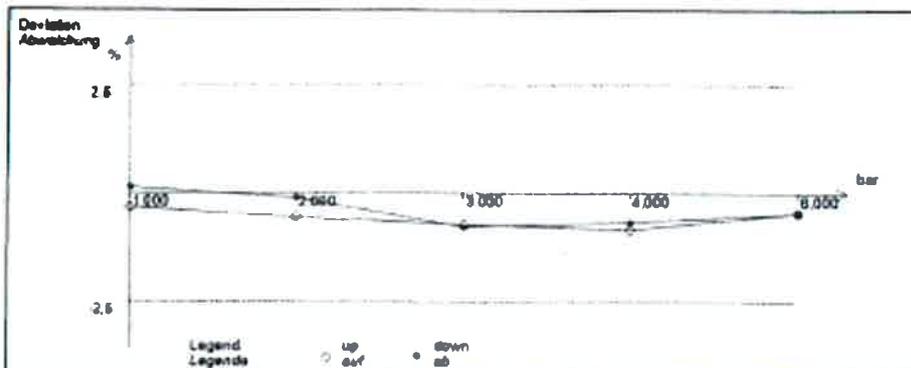
Reference  
 Referenzgerät  
 CPG2500 0,01% IS-50 -1 ... 32,1 bar ref

Calibration No.  
 Kalibriernummer  
 SW-101-1-17 WPL 17-04

Result  
 Ergebnis

Temperature  
 Temperatur  
 20°C +/- 0,5 K

Test item Prüfung bar	Standard Referenz bar	Measured Messewert bar	up Deviation rel. Abweichung bar	Linear Abweichung %	Hysteresis Hysterese %
1.000	1.020	0.992	1.000	-0.006	-0.10
2.000	2.013	2.006	2.010	-0.019	-0.44
3.000	3.044	3.047	3.045	0.045	0.05
4.000	4.010	4.040	4.045	-0.045	-0.17
6.000	6.028	6.028	6.028	-0.028	0.00



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

Inspection certificate according to EN 10204 - 3 1  
Abnahmeprüfzeugnis nach EN 10204 - 3 1



Page 2 / 2  
Seite

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Kunde **Hauff Technik GmbH & Co. KG**  
**Robert-Bosch-Straße 9**  
**Herrnangen**  
**89565**  
**DE**

Certificate No  
Zeugnis-Nr. **WC003866**

Date  
Datum **2017-05-05**

**Object keeps the specification**

**Der Kalibriergegenstand hält die Fertigungsgrenzen 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  
Abnahmebeauftragter **mud**  
**Daniel Kollwski**

Examiner  
Prüfer **J. Głodowski**

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Gersthofen, 3 July 2018



Figure A1. Water tightness test with  $\geq 1,0$  bar water filled test cylinder (manometer at the beginning of testing on 22.11.2017).



Figure A2. Water tightness test with  $\geq 1,0$  bar water filled test cylinder (manometer after 28 days on 20.12.2017).