Test Report no. A1742023-01 (eng)

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Project / Plant:	Water tightness test of the compensating attachable duct collar Hauff ADM 150-75/90/110 for retrofit dowelling on a concrete test block with exterior waterproofing PCI Pecimor 2K (waterproofing class W2.1E according to DIN 18533-1)
Order date:	22 November 2017
Product description:	Compensating attachable duct collar Hauff ADM 150-75/90/110
Order:	≥ 1,0 bar water tightness test 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 Tel. +49 821 72024-14
Number of annexes:	The test report contains 1 annex
Remark:	Translation of Test Report A1742023-01, 15 June 2018

Gersthofen, 15 June 2018
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Kiwa GmbH

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- Technical director -

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- Project manager -

Geschäftsführer: Prof. Dr. Roland Hüttl
Amtsgericht Hamburg, HRB 130568, St.Nr.: 46/736/03268

CONTENTS

1. General

Kiwa GmbH, Bautest Augsburg, was contracted by Hauff-Technik GmbH & Co. KG to test the water tightness of the compensating attachable duct collar Hauff ADM 150-75/90/110 [1] for retrofit dowelling on existing core drill installed on 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 the already installed compensating attachable duct collar Hauff ADM 150-75/90/110 together with the components for the test setup to our test laboratory in Gersthofen, Germany. The surface of the concrete 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).

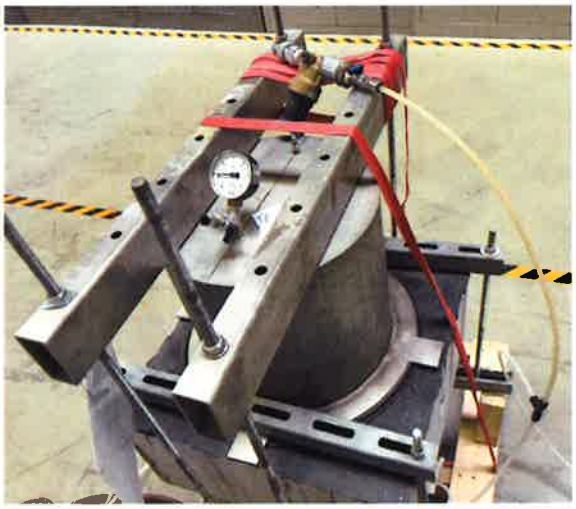


Figure 1. Assembled test setup.

2. References

[1] Hauff-Technik GmbH & Co. KG - „Montageanweisung für Andübelmanschette ADM 150 für Rohre DN75/90/110 und ADM 200 für Rohre DN90/110/125/140/160“. Rev.: 00/2018-01-26.

[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 compensating attachable duct collar at Kiwa GmbH in Gersthofen, Germany. According to information given by the manufacturer the test setup was assembled as follows:

A core drill Ø150 mm was placed through the middle of a concrete test block with the dimensions (l x w x h) 500 x 500 x 200 mm.

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

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 according to DIN EN 15814 [5] to create an exterior waterproofing.

After hardening of the exterior waterproofing the dowel ring was placed over the core drill and aligned for marking the dowel holes.

Subsequently the dowel holes (Ø 10 mm, 80 mm deep) for the plastic expansion dowels Fischer SXRL 10x80 were drilled and cleaned.

For the installation of the compensating attachable duct collar the pre-installed screws were set through the fastening dowels and sealing rings (see Figure 2- left).

The screws were tightened to max 14 Nm.

The compensating attachable duct collar Hauff ADM 150-75/90/110 was closed with a round rod Ø 110 mm and the tensioning strap was tightened to 10 Nm (see Figure 2- right).

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

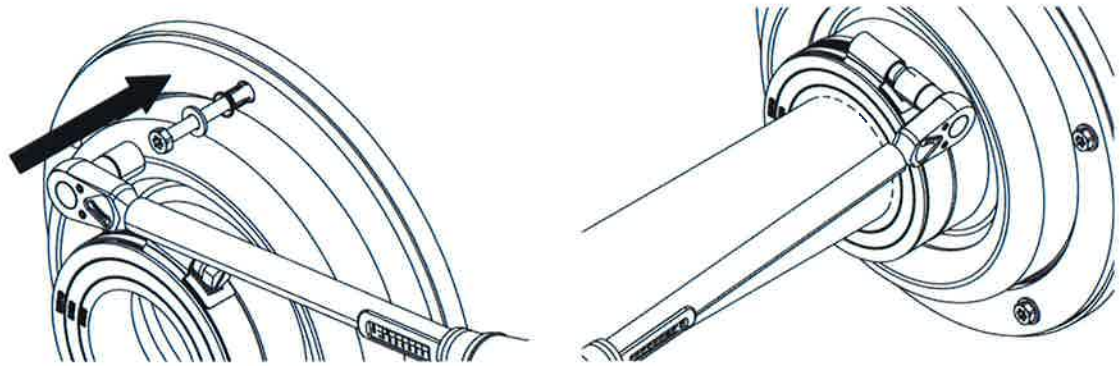


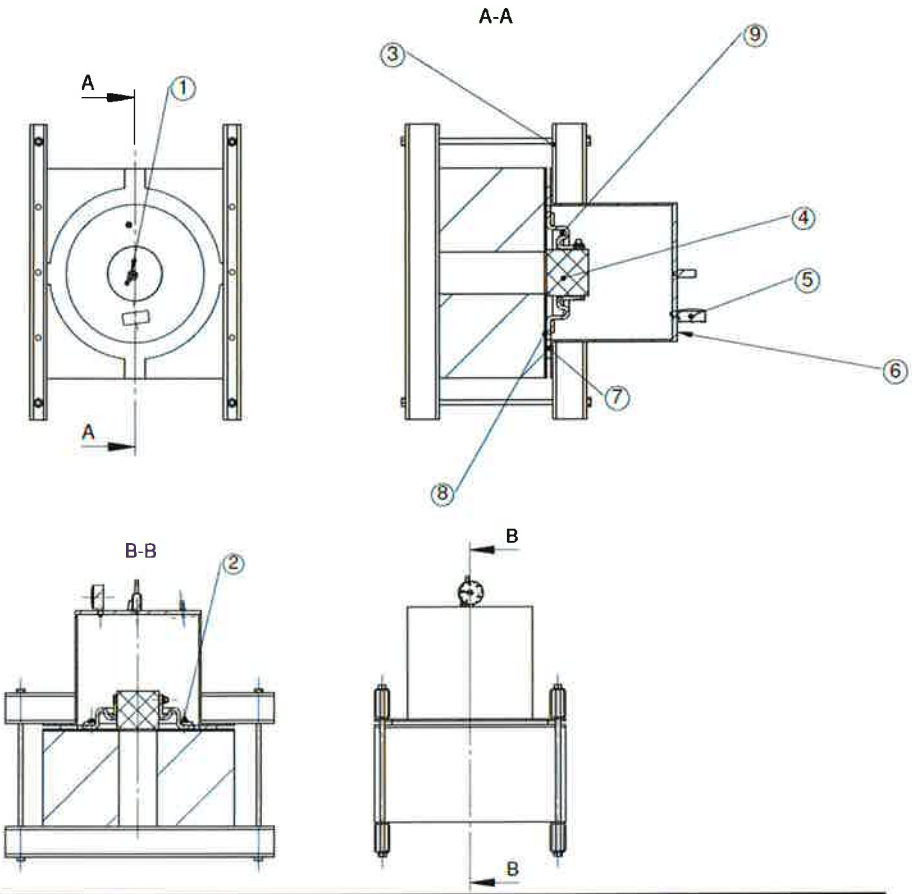
Figure 2. Example of installation of the compensating attachable duct collar Hauff ADM 150-75/90/110 (picture of the manufacturer).

3.2 Water tighness 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. 54604155 [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 ≥ 1,0 bar for 28 days.



Position	Designation
1	stop valve
2	fixing plugs
3	security bar
4	1 x round rod Ø 110 mm
5	pressure gauge manometer
6	test cylinder
7	test cylinder seal
8	polymer modified bituminous coating (PMBC)
9	compensating attachable duct collar "ADM 150-75/90/110"

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
ADM 150-75/90/110	≥ 1,0	≥ 1,0	28	no pressure drop as a result of leakages

5. Summary

During the water tightness test of the compensating attachable duct collar Hauff ADM 150-75/90/110 which was installed 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 ≥ 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 / Seite: 1 / 2

Customer: / Kunde:	Hauff-Technik GmbH & Co. KG Robert-Bosch-Straße 9 Hermaringen 89568 DE	Certificate No. / Zeugnis-Nr.	WC003865
		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.	22392920/3 31977549	Part No. / Artikel-Nr.	14225187
Model / Typ	111.10.063	Serial number / Seriennummer	54604155
		Scale range / Anzeigebereich	0 ... 6 bar rel.
Class / Klasse	2,50 %	Tag No. / Messstellen-Nr.	

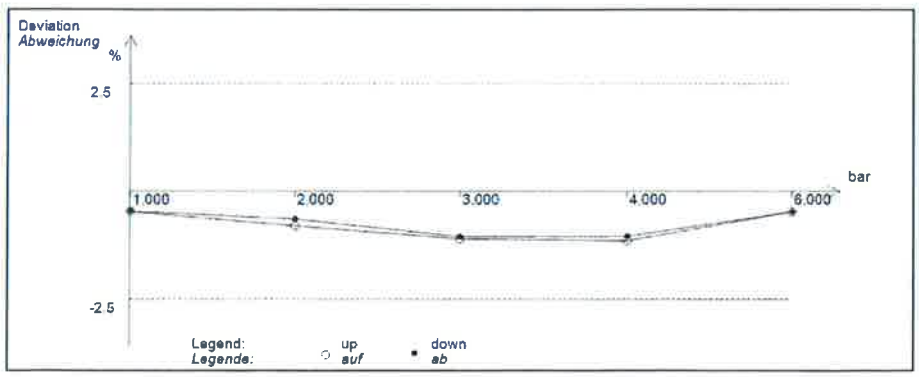
Reference / Referenzgerät: CPG2500 0,01% IS-50 -1 ... 32,1 bar rel.

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

Result / Ergebnis

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

Test Item / Prüfling bar	Standard / Referenz bar		Meanvalue / Mittelwert bar	rel. Deviation / rel. Abweichung bar	Deviation / Abweichung %	Hysteresis / Hysterese %
1,000	1,028	1,027	1,028	-0,028	-0,47	-0,02
2,000	2,048	2,038	2,043	-0,043	-0,72	-0,16
3,000	3,066	3,063	3,065	-0,065	-1,08	-0,05
4,000	4,069	4,062	4,065	-0,065	-1,09	-0,10
6,000	6,028	6,028	6,028	-0,028	-0,47	0,00



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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
Hermaringen
89568
DE

Certificate No. / Zeugnis-Nr.: WC003865

Date / Datum: 2017-05-05

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 (NJD) Daniel Kotlewski
Abnahmebeauftragter

Examiner J.Glodowski
Prüfer

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Gersthofen, 15 June 2018

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

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