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

Project / Plant:	Water tightness test of the single wall insert Hauff HSI150-K/150 and system cover Hauff HSI150-DT, embedded in a standard concrete test block with reinforcement (system according to Lithobeton)
Order date:	5 March 2019
Product description:	Single wall insert Hauff HSI 150-K/150 System cover Hauff HSI150-DT
Order:	Water tightness test with ≥ 2,5 bar for 28 days, ≥ 3,5 bar for 7 days and ≥ 4,0 bar for 7 days of the single wall insert Hauff HSI 150-K/150 and system cover Hauff HSI150-DT
Number of samples / tests:	3 tests
Sampling:	on: - / by: Applicant
Date of delivery:	5 March 2019
Testing period:	5 March - 25 April 2019
Contact:	B. Eng. David Röck Tel. +49 821 72024-14
Remark:	Translation of Test Report A1942021-02 25 April 2019

Gersthofen, 25 April 2019
rö/bö

p. p.
B. Eng. David Röck
- Project manager -

Kiwa GmbH

p. p.
Jörg Bölzle
- Project manager -

CONTENTS

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/150 and system cover Hauff HSI150-DT embedded in a standard concrete test block with reinforcement made by the manufacturer Lithobeton nv.

Therefore an assembled test setup with concrete embedded single wall insert Hauff HSI150-K/150 and system cover Hauff HSI150-DT was delivered by Hauff-Technik GmbH & Co. KG to our test laboratory in Augsburg, Germany (see Figure 1).

Figure 1. Delivered test setups.

2. References

[1] Hauff-Technik GmbH & Co. KG - „Montageanweisung HSI 90/HSI 150", ma_HSI 90_150 so_wird_einbetoniert_151202".

[2] WIKA Polska sp. z o.o. sp. k. - "Inspection certificate according to EN 10204 - 3.1. Certification No. WC006945. 19 March 2019.

[3] WIKA Polska sp. z o.o. sp. k. - "Inspection certificate according to EN 10204 - 3.1. Certification No. WC006962. 20 March 2018.

3. Test procedure

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

The installation of the test setup was performed by Hauff-Technik GmbH & Co. KG, the manufacturer of the single wall insert and of the system cover.

According to information given by the manufacturer the test setup was assembled as follows:

The test block (500 x 500 x 200 mm) made by Lithobeton nv with the embedded single wall insert Hauff HSI150-K/150 was delivered to Hauff-Technik GmbH & Co. KG (see an example in Figure 2).

After a visual inspection of the concrete quality Hauff-Technik GmbH & Co. KG installed the system cover Hauff HSI150-DT into the opening of the single wall insert at the pressure side of the test block (see Figure 3).

The testing area was covered with a stainless steel cover plate with pressure reducer and calibrated manometers (see Chapter 6). The sealing of the cover plate was performed with the help of an EPDM plate and clamping pressure.

Figure 2. Examples for a test block with embedded single wall insert Hauff HSI150-K/150.

Figure 3. Test block with concrete embedded single wall insert Hauff HSI150-K/150 and system cover Hauff HSI150-DT.

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 4 to Figure 6).

Calibration certificates of the used manometers can be seen at Chapter 6. An additional calibration of the manometers which were delivered by Hauff-Technik GmbH & Co. KG did not take place at Kiwa GmbH.

After prior consultation with the manufacturer the tests of the water tightness were performed with ≥ 2,5 bar for 28 days, ≥ 3,5 bar for 7 days and ≥ 4,0 bar for 7 days. The test with ≥ 2,5 bar and ≥ 3,5 bar was performed with permanently attached water pressure. The test with ≥ 4,0 bar was performed with a water/air mixture.

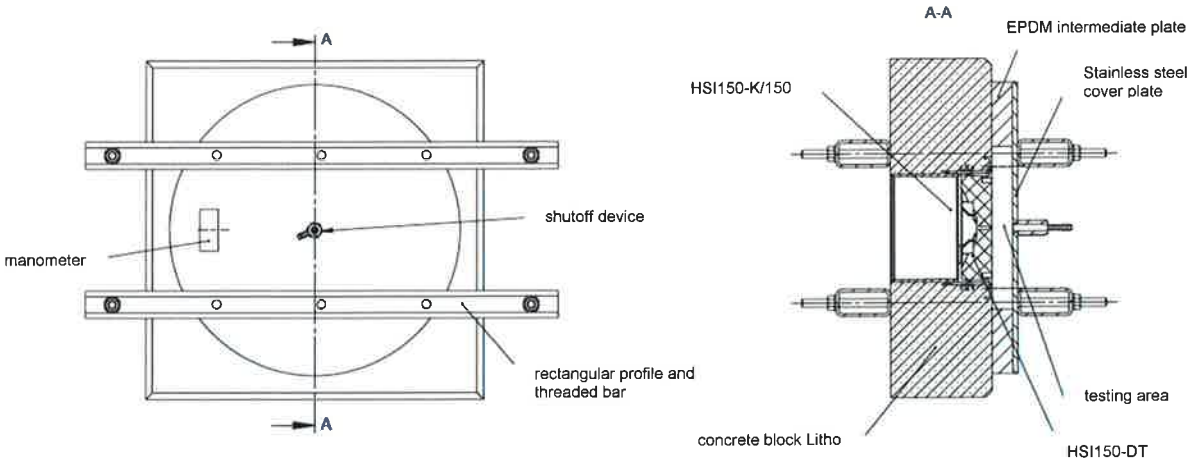

Figure 4. Detail of the test setup - manufacturer`s drawing.

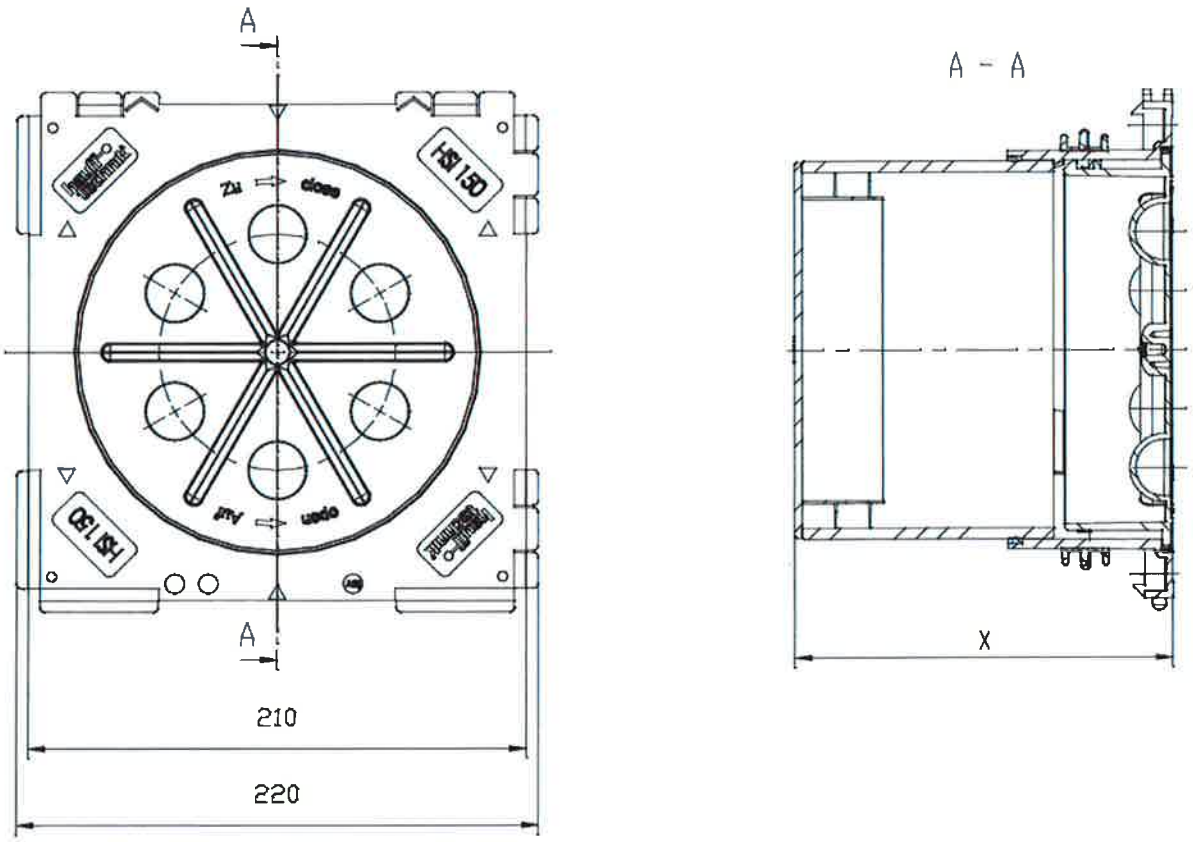

Figure 5. Detail of the single wall insert Hauff HSI150-K/150 - manufacturer`s drawing.

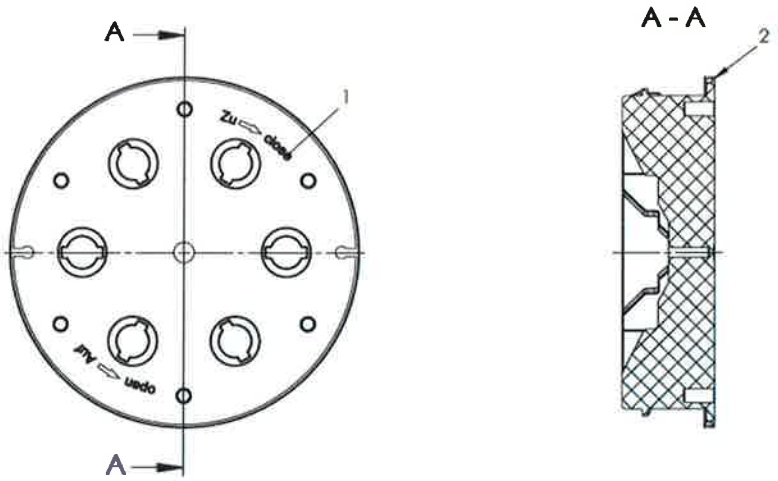

Figure 6. Detail of the system cover Hauff HSI150-DT - manufacturer`s drawing.

4. Test results

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

Table 1. Results of the water tightness tests.

Test specimen	Water pressure ath the beginning of testing [bar]	Water pressure at the end of testing [bar]	Testing period [d]	Remark
HSI15-DT	≥ 2,5	≥ 2,5	28	No leakages were detected
	≥ 3,5	≥ 3,5	7	
	≥ 4,0	≥ 4,0	7	

5. Summary

During the water tightness tests of the single wall insert Hauff HSI150-K/150 and the system cover Hauff HSI150-DT, embedded in a reinforced standard concrete test block by made by Lithobeton nv, no leakages were detected at ≥ 2,5 bar for 28 days, ≥ 3,5 bar for 7 days and ≥ 4,0 bar for 7 days.

6. Calibration certificates

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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.	WC005945
				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.	226669602 32210713	Part No. Artikel-Nr.	14225186		
Model Typ	111.10.063	Serial number Seriennummer	5400TD6I	Scale range Anzeigebereich	0 ... 2,5 bar rel.
Class Klasse	2.50 %	Tag No. Messstellen-Nr.			
Reference Referenzgerät				Calibration No. Kalibriernummer	
CPG2500 0,01% -1 ... 2,7 bar rel.				SW-102-1-17 WPL 17-04	
Article text Artikeltext	Bourdon tube pressure gauges,model 111				

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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

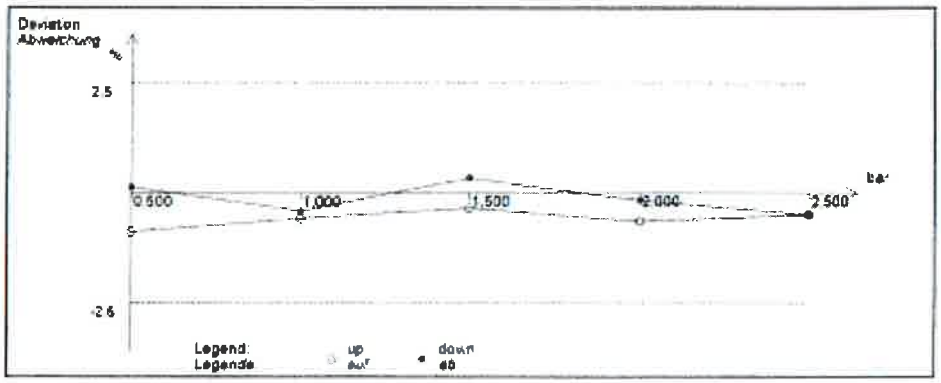
Certificate No / Zeugnis-Nr.: WC006945

Date / Datum: 19.03.2018

Result / Ergebnis

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

Test item Prüfling bar	Standard Referenz bar		Measuring value Messwert bar	rel. Deviation rel. Abweichung bar	Deviation Abweichung %	Hysteresis Hysterese %
0,500	0,522	0,496	0,509	-0,009	-0,37	-1,02
1,000	1,014	1,010	1,012	-0,012	-0,48	-0,17
1,500	1,509	1,491	1,500	0,000	0,00	-0,69
2,000	2,016	2,004	2,010	-0,010	-0,40	-0,48
2,500	2,512	2,512	2,512	-0,012	-0,49	0,00



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 / Abnahmebeauftragter: i.V.i.A. Daniel Kotlewski

Examiner / Prüfer: S.Piekarski

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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	WC006982
				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	22866980/3 32210715	**Part No.** Artikel-Nr	14225187		
Model Typ	111.10.063	**Serial number** Sernernummer	5400TD6D	**Scale range** Anzeigebereich	0 ... 6 bar rel
Class Klasse	2.50 %	**Tag No** Messstellen-Nr			

Reference
Referenzgerät
CPG2500 0,01% IS-60 -1 ... 32,1 bar rel.

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

Article text
Artikeltext
Bourdon tube pressure gauges, model 111

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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

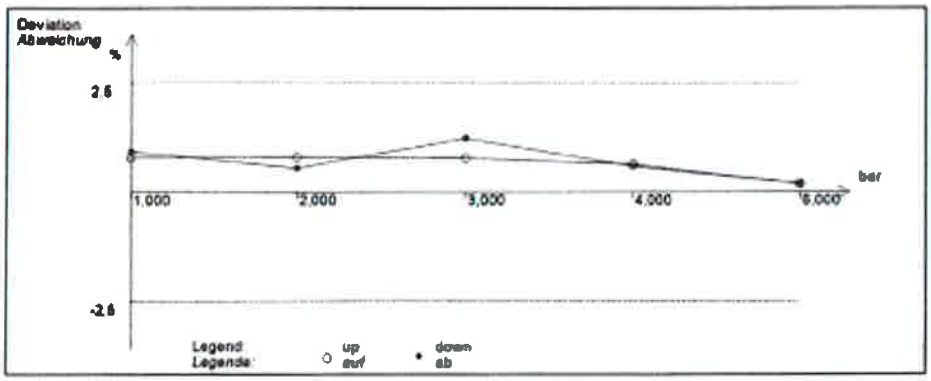
Certificate No / Zeugnis-Nr.: WC006962

Date / Datum: 2018-03-20

Result / Ergebnis

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

Test item Prüfling bar	Standard Referenz bar ↑	↓	Measure Messwert bar	rel. Deviation rel. Abweichung bar	Deviation Abweichung %	Hysteresis Hysterese %
1,000	0,952	0,944	0,948	0,052	0,86	-0,14
2,000	1,952	1,967	1,960	0,040	0,67	0,25
3,000	2,953	2,926	2,940	0,060	1,01	-0,44
4,000	3,962	3,965	3,963	0,037	0,61	0,05
6,000	5,988	5,988	5,988	0,012	0,19	0,00



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 (NJD)
Abnahmebeauftragter: Daniel Kotlewski

Examiner
Prüfer: J. Glodowski

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