

Test report no. A1942021-02a (eng)
Replacement for
Test Report no. A1942021-02 (eng)



Kiwa GmbH
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Project / Plant: Water tightness test of the single wall insert Hauff HSI150-K/150 and system cover Hauff HSI150-DT, embedded in a waterproof concrete test block with concrete strength C25/30

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 $\geq 2,5$ bar for 28 days, $\geq 3,5$ bar for 7 days and $\geq 4,0$ 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 A1942021-02a
29 April 2019

Gersthofen, 29 April 2019
rö/bö

p. p.

B. Eng. David Röck
- Project manager -



p. p.

M. Sc. Laura Frank
- 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/150 and system cover Hauff HSI150-DT embedded in a waterproof concrete test block with concrete strength C25/30.

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] WIK A Polska sp. z o.o. sp. k. - “Inspection certificate according to EN 10204 - 3.1. Certification No. WC006945. 19 March 2019.
- [3] WIK A 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:

A waterproof concrete test block (500 x 500 x 150 mm) with concrete strength C25/30 and 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 $\geq 2,5$ bar for 28 days, $\geq 3,5$ bar for 7 days and $\geq 4,0$ bar for 7 days. The test with $\geq 2,5$ bar and $\geq 3,5$ bar was performed with permanently attached water pressure. The test with $\geq 4,0$ bar was performed with a water/air mixture.

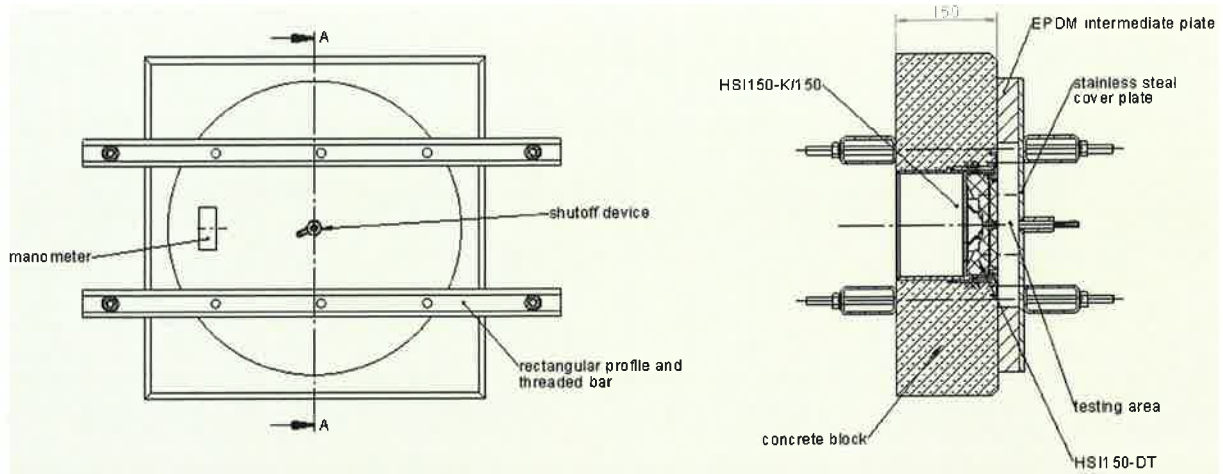


Figure 4. Detail of the test setup - manufacturer's drawing.

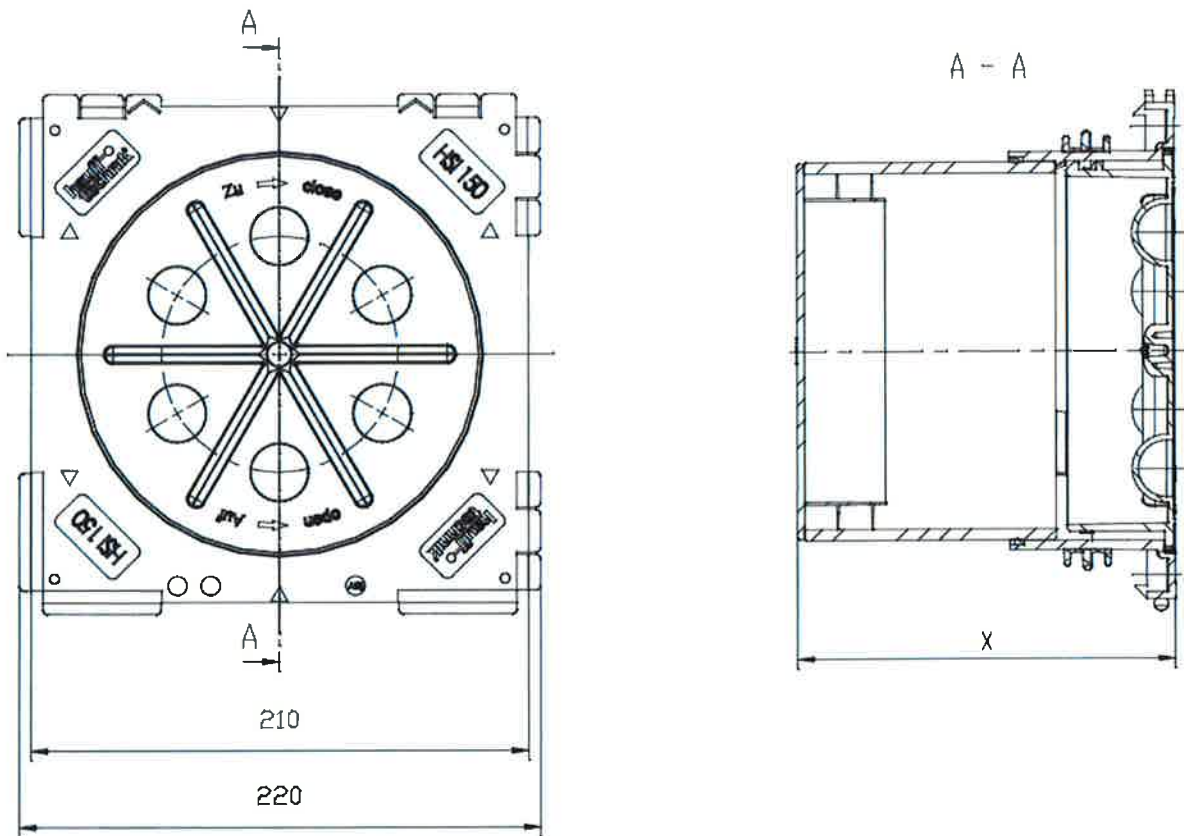


Figure 5. Detail of the single wall insert Hauff HSI150-K/150 - manufacturer's drawing.

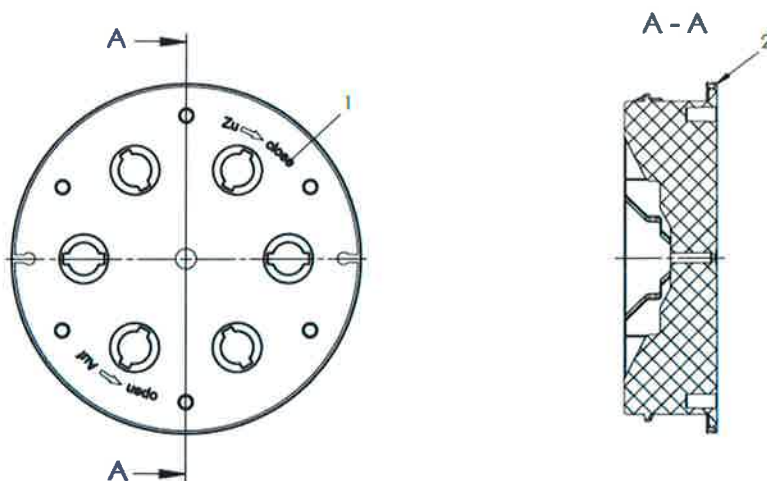


Figure 6. Detail of the system cover Hauff HSI150-DT - manufacturer's drawing.

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 at the beginning of testing [bar] | Water pressure at the end of testing [bar] | Testing period [d] | Remark |
|---------------|--|--|--------------------|---------------------------|
| HSI150-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 waterproof concrete test block with concrete strength C25/30, no leakages of the system 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



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

Certificate No.
Zeugnis-Nr. WC006945

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. | 22066960/2 32210713 | Part No. Artikel-Nr. | 14225186 |
|---|------------------------|-------------------------|----------|

| | | | | | |
|--------------|------------|-------------------------------|----------|-------------------------------|--------------------|
| Model Typ | 111.10.063 | Serial number Seriennummer | 5400T061 | Scale range Anzeigebereich | 0 ... 2,5 bar rel. |
|--------------|------------|-------------------------------|----------|-------------------------------|--------------------|

| | | | |
|-----------------|--------|----------------------------|--|
| Class Klasse | 2,50 % | Tag No. Messstellen-Nr. | |
|-----------------|--------|----------------------------|--|

| | | | |
|----------------------------|-----------------------------------|--|-----------------------|
| Reference Referenzgerät | CPG2500 0,01% -1 ... 2,7 bar rel. | Calibration No. Kalibrierungsnummer | 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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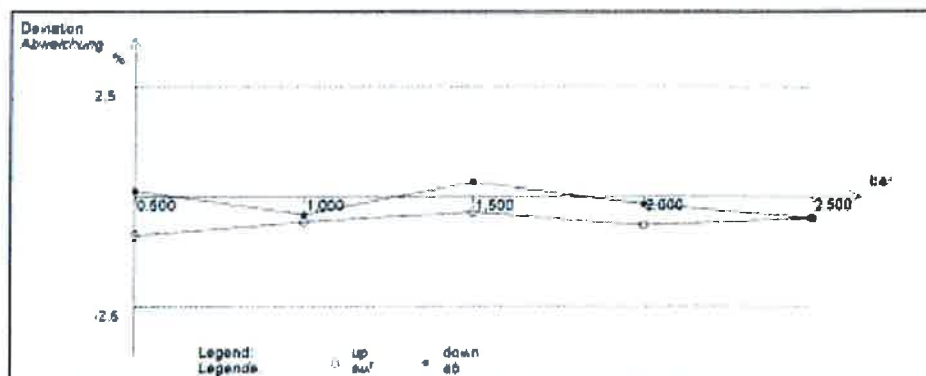
Customer: Hauff-Technik GmbH & Co. KG
 Kunde: Robert-Bosch Straße 9
 Hermlingen 89568 DE

Certificate No. WC006645
 Zeugnis-Nr.

Date 19.03.2018
 Datum

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

| Test Item Prüfung be | Standard Referenz bar | Measured Mittelwert bar | rel. Deviation rel. Abweichung bar | Deviation Abweichung % | Hysteresis Hysterese % |
|----------------------------|-----------------------------|-------------------------------|--|------------------------------|------------------------------|
| 0,500 | 0,522 | 0,496 | 0,509 | -0,009 | -0,37 |
| 1,000 | 1,014 | 1,010 | 1,012 | -0,012 | -0,17 |
| 1,500 | 1,509 | 1,491 | 1,500 | 0,000 | -0,69 |
| 2,000 | 2,016 | 2,004 | 2,010 | -0,010 | -0,48 |
| 2,500 | 2,512 | 2,512 | 2,512 | -0,012 | 0,00 |
| | | | | | |
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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: IN-D: Daniel Kotlowski
 Abnahmebeauftragter: Daniel Kotlowski
 Examiner: S. PiekarSKI
 Prüfer: S. PiekarSKI

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Abnahmeprüfzeugnis nach EN 10204 - 3.1



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| | | Seite | |
| Customer | Hauff-Technik GmbH & Co. KG Robert-Bosch-Straße 9 Herrlingen 89068 DE | Certificate No. | WC006982 |
| Kunde: | | Zaugsnr.-Nr. | |
| | | Date | 2018-03-20 |
| | | Datum | |
| Customer Order No | 175211375 | Customer Part. No | Order Date |
| Kundenbestellnummer | | Kunden Artikel-Nr. | Bestelldatum |
| Order No / Item | 22906980/3 | Part No. | 14225187 |
| Auftrags-Nr. / Pos. | 32210715 | Artikel-Nr. | |
| Model | 111.10.083 | Serial number | 5400TD8D |
| Typ | | Seriennummer | |
| Class | 2.50 % | Tag No | Scale range |
| Klasse | | Messstellen-Nr. | Anzeigebereich |
| Reference | | Calibration No. | |
| Referenzgerät | | Kalibriernummer | |
| CPG2500 | 0,01% IS-60 -1 ... 32,1 bar rel. | SW-101-1-17 WPL 17-04 | |
| Article text | Bourdon tube pressure gauges, model 111 | | |
| Artikeltext | | | |

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

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



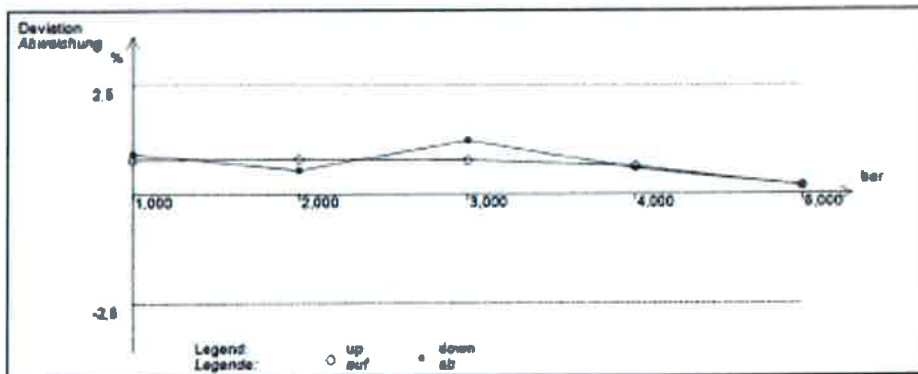
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Customer: Hauff-Technik GmbH & Co. KG
Kunde: Robert-Boach-Straße 9
Herrnaringen
89568
DE

Certificate No: WC006982
Zeugnis-Nr.
Date: 2018-03-20
Datum

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

| Test item Prüfung bar | Standard Referenz bar | Measured Messwert bar | rel. Deviation rel. Abweichung bar | Deviation Abweichung % | Hysteresis Hysterese % |
|-----------------------------|-----------------------------|-----------------------------|--|------------------------------|------------------------------|
| 1.000 | 0.952 | 0.944 | 0.948 | 0.052 | 0.88 |
| 2.000 | 1.952 | 1.967 | 1.960 | 0.040 | 0.67 |
| 3.000 | 2.953 | 2.929 | 2.940 | 0.060 | 1.01 |
| 4.000 | 3.962 | 3.965 | 3.983 | 0.037 | 0.61 |
| 5.000 | 4.968 | 4.968 | 4.980 | 0.012 | 0.19 |
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Object keeps the specification
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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 (UND): Daniel Kottewski
Abnahmebeauftragter: Daniel Kottewski
Examiner Prüfer: J. Głodowski

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