

Test Report

Applicant

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Order no.

A 9016-2a (eng) / 2015
Replacement for Test Report
A 9016-2 (eng) / 2015

Product : Cable feed-through HSI 150-K2-Varia with variable length adjustment

Project : Testing of the water tightness of the cable feed-through Hauff HSI 150-K2-Varia

Sample delivery by : Hans Baur GmbH and Hauff-Technik GmbH & Co. KG

Testing period : August 17th – 21st, 2015

Tested by : Kiwa GmbH, Bautest Augsburg

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Augsburg, February 24th, 2016
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This Test Report consists of 8 Pages and 2 Annexes.

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Interpretations and opinions of the testing laboratory have been marked in *Italic* scripts according to DIN EN ISO / IEC 17 025 mark 5.10.5.

In case of doubt and disagreement, the original version of the Test Report is valid.

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1 General

Kiwa GmbH, Bautest Augsburg was contracted by Hauff-Technik GmbH & Co. KG to test the water tightness of a cable feed-through Hauff HSI 150-K2-Varia which was embedded in a concrete specimen with concrete strength C25/30 (waterproof concrete). The test was performed with a permanent connected water pressure of 1,0 bar for 24 hours and subsequently with 2,5 bar for 72 hours.

For the test a cable feed-through HSI 150-K2-Varia (see Figure 1) was delivered by Hauff-Technik GmbH & Co. KG to our laboratory in Augsburg. The casting of the concrete specimen with the embedded cable feed-through was performed by Hans Baur GmbH, Rederzhausen. The test setup was built up by employees of Hauff-Technik GmbH & Co. KG at Kiwa GmbH in Augsburg (see Figure 2).

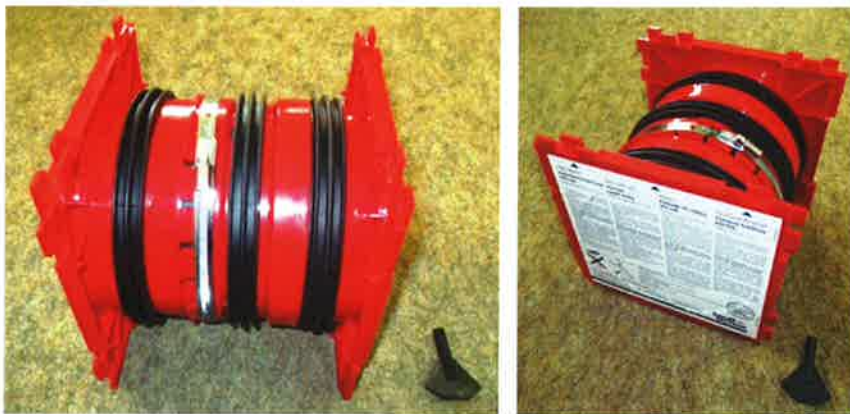


Figure 1. Cable feed-through Hauff HSI 150-K2-Varia with wrench.



Figure 2. Example for a test setup.

2 References

- [1] DIN EN 206:2014-07. Concrete - Specification, performance, production and conformity; German version EN 206:2013.
- [2] DIN 1045-2:2014-08. Concrete, reinforced and prestressed concrete structures - Part 2: Concrete - Specification, performance, production and conformity - Application rules for DIN EN 206.

3 Test procedure

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

The concrete specimen used for the water tightness test was cast by Hans Baur GmbH, Rederzhausen. The concrete parameters of the batch are listed in Table 1.

Table 1. Concrete parameters [1], [2].

Concrete class	Specimen nomenclature	Dimensions lxbxw [mm]	Concrete mixture	Concrete strength	Exposure class	W/C-ratio	Date of casting
waterproof concrete with 28 days of water immersion	"HSI 150-K2-Varia"	500x500x200	15332170	25/30	XC4/XF1/XA1/WU/WF	0.55	07.05.2015

The concrete specimen with the embedded cable feed-through was produced and delivered by Hans Baur GmbH, Rederzhausen.

The length adjustment of the cable feed-through and the fixing of the band clamp with the help of the wrench with included torque limiter remaining to the system was performed by Hauff-Technik GmbH & Co. KG at Kiwa Augsburg before casting.

The concrete specimen (500x500x200 mm, C25 / 30 (waterproof concrete [1], [2])) with the embedded cable feed-through HSI 150-K2-Varia was stored in water for 28 days after removing the concrete framework.

The test setup was built up by Hauff-Technik GmbH & Co. KG at Kiwa Augsburg. According to information given by the manufacturer the test setup was assembled as described below.

Afterwards Hauff Technik GmbH & Co. KG attached a pressure bell with pressure reducer and manometer on the formwork smooth surface. The sealing between clamping bell and concrete surface was performed with the help of a 40 mm thick EPDM sealing (see Figure 3) and the clamping pressure.



Figure 3. Test specimen before the installation of the clamping bell.

3.2 Water tightness test (Kiwa GmbH)

The test setup which was assembled by Hauff-Technik GmbH & Co. KG was made up in accordance to section 2.1. Also the manometer at the test setup was installed by the manufacturer (see Figure 4 to Figure 8).

A 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 a test of the water tightness with 1,0 bar permanently attached water pressure for 24 hours and subsequently 2,5 bar for 72 hours was performed.

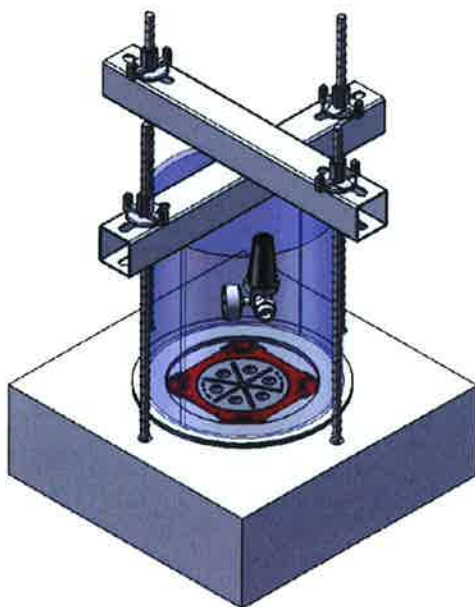


Figure 4. Detail of the test setup - manufacturer's drawing.

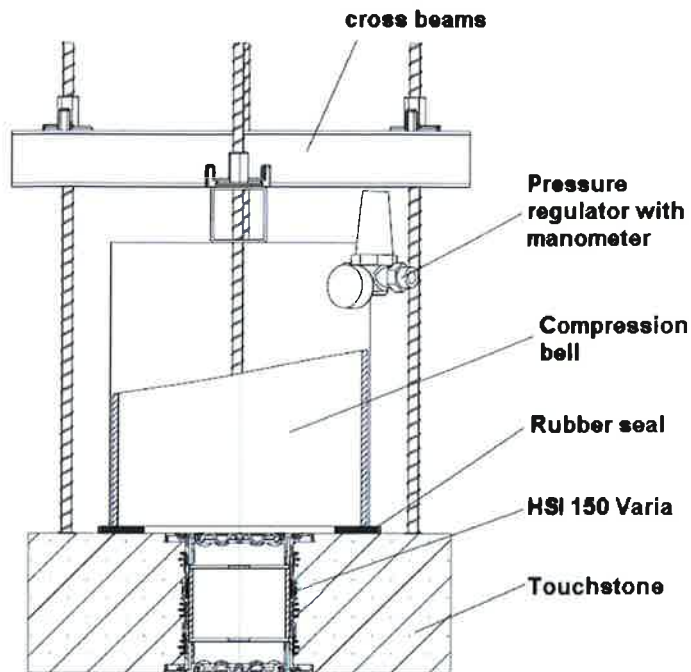


Figure 5. Cross-section through the test setup - manufacturer's drawing.

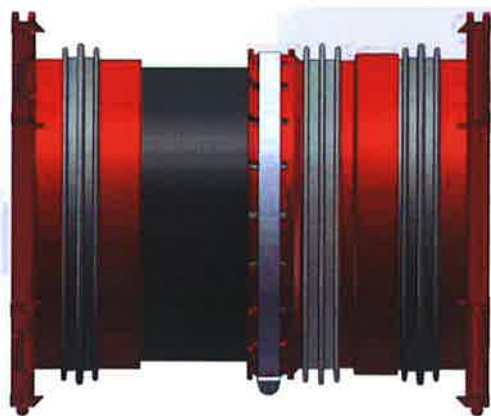


Figure 6. Side view of the cable feed-through - manufacturer's drawing.



Figure 7. Test specimen after removal of the compression bell and protective foil.



Figure 8. Test specimen after removal of the compression bell and sealing cap.

4 Test results

During the water tightness tests there was no pressure drop as a result of leakages. The water pressure depending on the testing period can be seen at Figure A1 to Figure A4 attached in the annex.

Table 2. Result of the water tightness test in dependency of the testing period.

Test specimen	Water pressure [bar]	Testing period [h]	Remark
"HSI 150-K2-Varia"	1,0	24	water-tight
	2,5	72	water-tight

5 Summary

During the water tightness test of the cable feed-through Hauff HSI 150-K2-Varia, embedded into a concrete specimen with concrete strength C25/30 (waterproof concrete) and permanently attached to a water pressure of 1,0 bar for 24 hours and subsequently 2,5 bar for 72 hours, no pressure drop and no water outflow as a result of leakages occurred.

Augsburg, February 24th, 2016