

## Test Report

Applicant

Hauff-Technik GmbH & Co. KG  
Mr Thomas Eßwein  
Robert-Bosch-Straße 9  
89568 Hermaringen  
Germany

Order no.:

A 9084-1a (eng) / 2015  
Replacement for Test Report  
A 9084-1 (eng) / 2016

Product : Press seal HRD150-SG-3/22-54 and  
HRK150-SSG-3/24-54

Project : Testing of the gas tightness of the press seals  
HRD150-SG-3/22-54 and  
HRK150-SSG-3/24-54

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

Testing period : January 11<sup>th</sup> – 21<sup>th</sup> 2016

Tested by : Kiwa GmbH, Bautest Augsburg

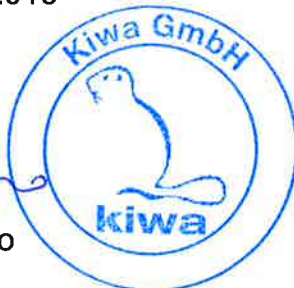
Contact : B. Eng. David Röck  
Tel. +49 821 72024-14

Remark : Translation of Test Report A 9084-1 / 2015  
of February 24<sup>th</sup>, 2016

Augsburg, March 14<sup>th</sup>, 2016  
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Dr.-Ing. Massimo Sosoro  
- Test laboratory manager -



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Werner Großmann  
- Department manager concrete -

This Test Report consists of 7 Pages and 3 Annexes.

Without our written permission, the test report may only be published unabridged.

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 gas tightness of the press seals HRD150-SG-3/22-54 and HRK150-SSG-3/24-54. The tests were performed with 2,5 bar at 21°C for 24 hours, 2,5 bar at 0°C for 24 hours and subsequently with 2,5 bar at 50°C for 24 hours.

Therefore two assembled test setups were delivered by Hauff-Technik GmbH & Co. KG to our test laboratory in Augsburg, Germany (see Figure 1).

The press seals HRD150-SG-3/22-54 and HRK150-SSG-3/24-54 are divided sealing systems for three cables  $\varnothing$  42 mm used as sealings for building entries in an existing wall sleeve or core drills of  $\varnothing$  150 mm.



Figure 1. Delivered test setups with already installed press seals HRD150-SG-3/22-54 (left) and HRK150-SSG-3/24-54 (right).

## 2 Test procedure

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

According to information given by the manufacturer the test setups were assembled as followed.

The press seals HRD150-SG-3/22-54 and HRK150-SSG-3/24-54 were each installed into a testing cylinder and grouted by using the locking screws included into the sealing systems.

The press seals were assembled with each 3 round rods  $\varnothing$  42 mm simulating the cables.

In addition the round rods were secured with a crossbeam.

## 2.2 Test procedure (Kiwa GmbH)

The test setups which were assembled by Hauff-Technik GmbH & Co. KG were built up in accordance to Section 2.1 with one manometer on each test setup (see Figure 2 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 tests of the gas tightness were performed with 2,5 bar at 21°C for 24 hours, 2,5 bar at 0°C for 24 hours and subsequently with 2,5 bar at 50°C for 24 hours.

The test setups were tempered for at least 2 hours to the actual test temperature before the effective test period was counted. The pressure was regulated between every test period.

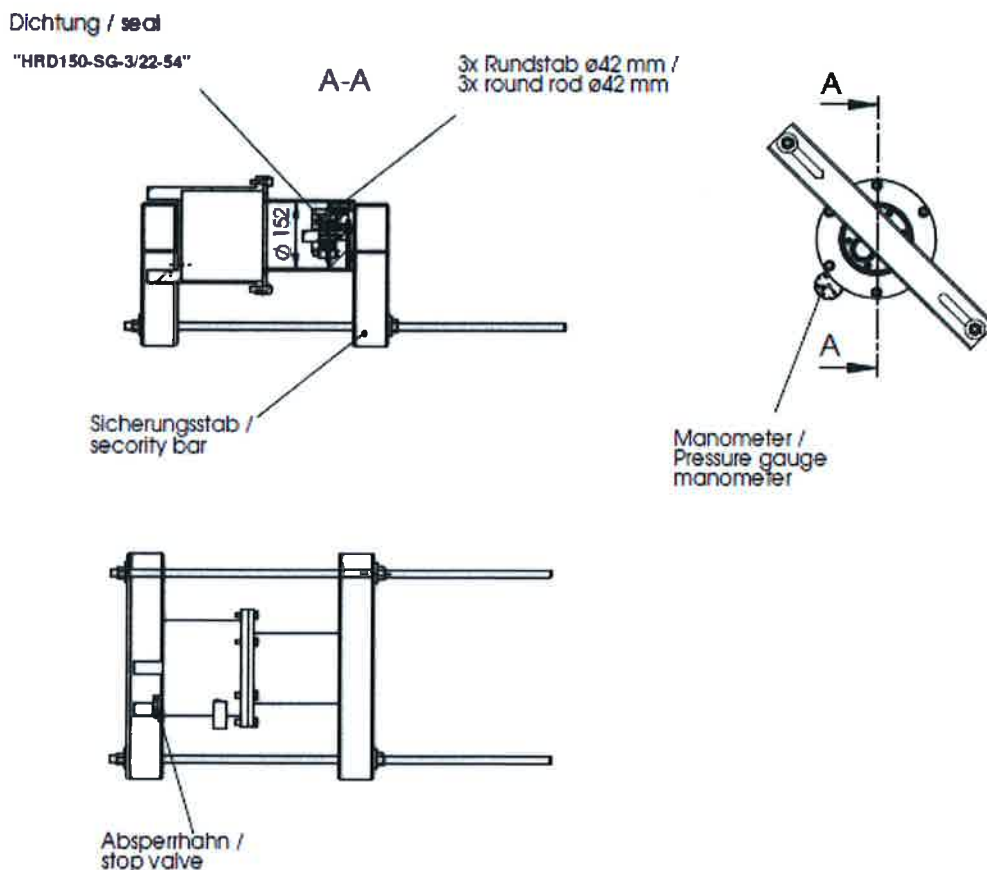


Figure 2. View and cross-section of the test setup with HRD150-SG-3/22-54 - manufacturer's drawing.

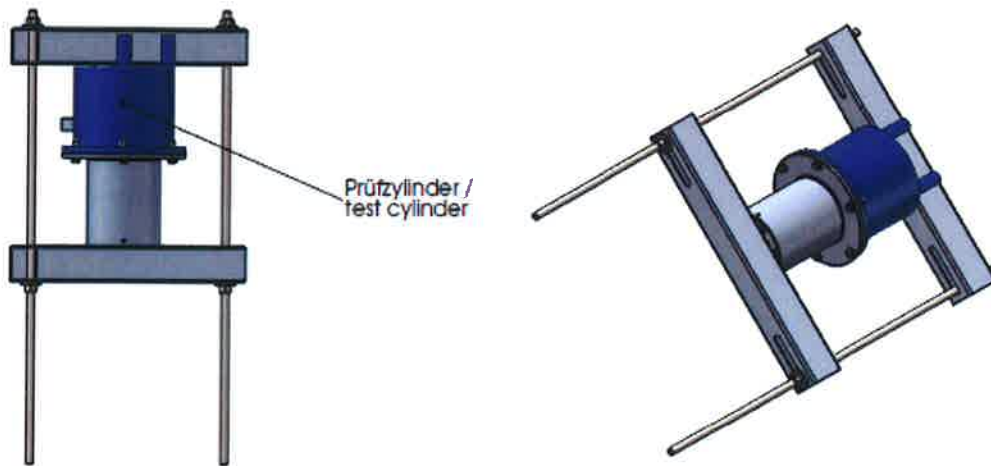


Figure 3. View of the test setup with HRD150-SG-3/22-54 - manufacturer`s drawing.

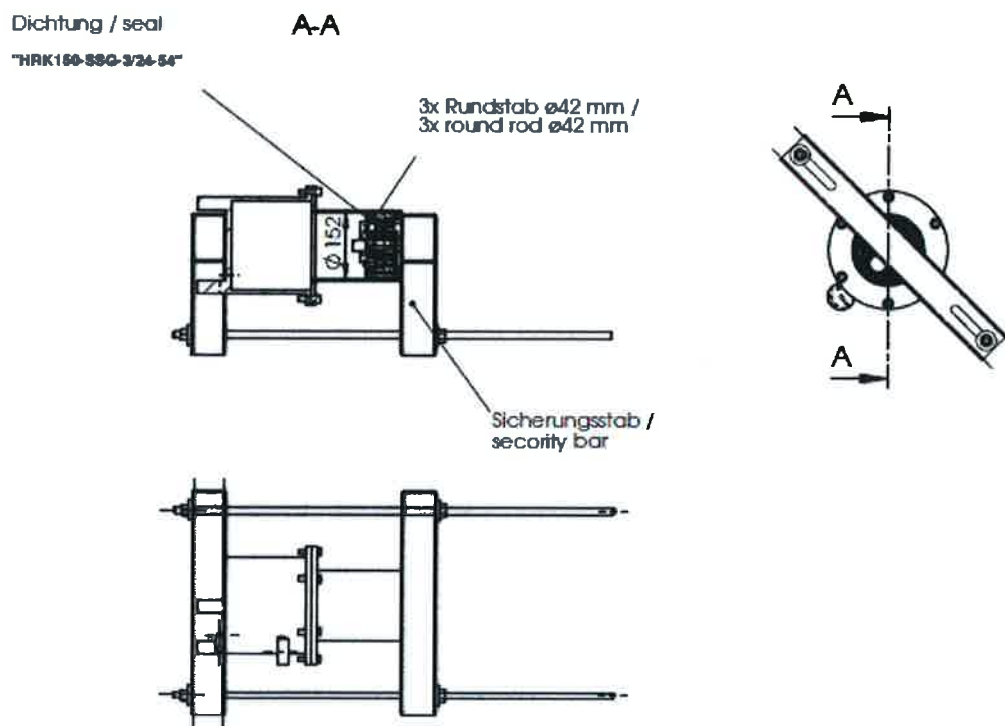


Figure 4. View and cross-section of the test setup with HRK150-SSG-3/24-54 - manufacturer`s drawing.

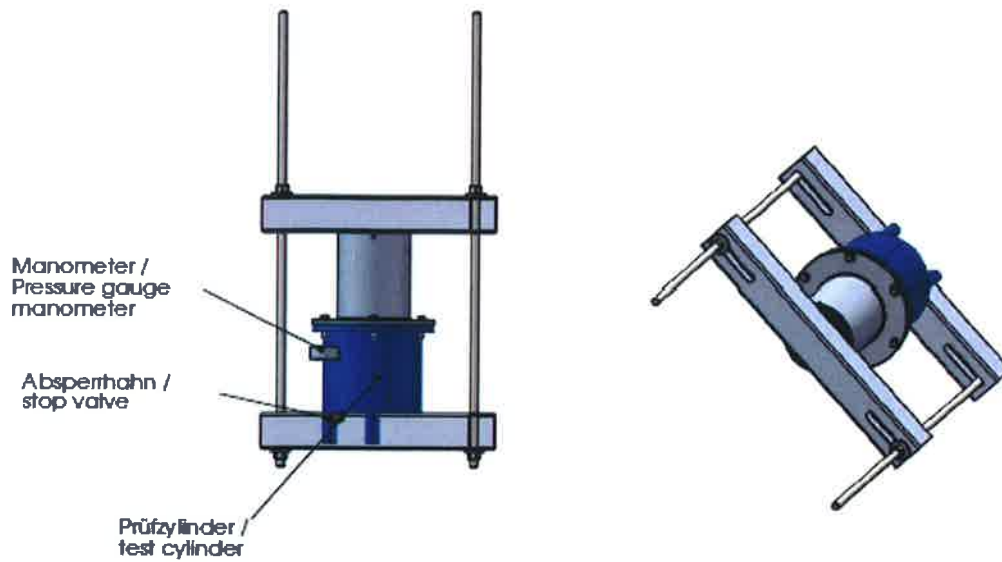


Figure 5. View of the test setup HRK150-SSG-3/24-54 - manufacturer's drawing.

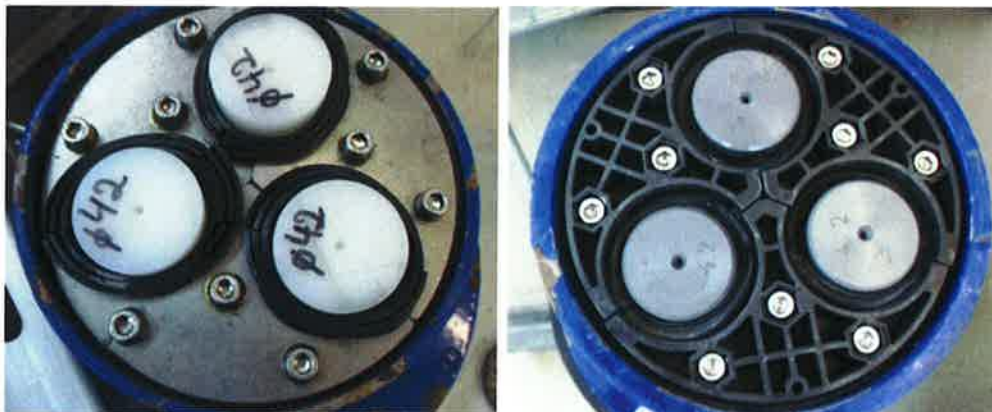


Figure 6. Top view of the the press seals (left: HRD150-SG-3/22-54; right: HRK150-SSG-3/24-54).



Figure 7. View of the top side of the press seals after removing the round rods (left: HRD150-SG-3/22-54; right: HRK150-SSG-3/24-54).



Figure 8. View of the reverse side of the press seals after removing the round rods (left: HRD150-SG-3/22-54; right: HRK150-SSG-3/24-54).

### 3 Test results

During the gas tightness tests there was no pressure drop as a result of leakages (see Table 1). The pressure depending on the testing period and testing temperature can be seen at Figure A1 to A6 attached in the annex.

Table 1. Results of the gas tightness tests depending on the testing period and testing temperature.

Test specimen	Temperature [°C]	Pressure [bar]	Testing period [h]	Remark
HRD150-SG-3/22-54	+21	2,5	~ 24	gas-tight
	0		~ 24	gas-tight
	+50		~ 24	gas-tight
HRK150-SSG-3/24-54	+21	2,5	~ 24	gas-tight
	0		~ 24	gas-tight
	+50		~ 24	gas-tight

### 4 Summary

*During the gas tightness tests with the press seals HRD150-SG-3/22-54 and HRK150-SSG-3/24-54, performed with 2,5 bar at 21°C for 24 hours, 2,5 bar at 0°C for 24 hours and subsequently with 2,5 bar at 50°C for 24 hours, there was no pressure drop as a result of leakages.*

Augsburg, March 14<sup>th</sup>, 2016

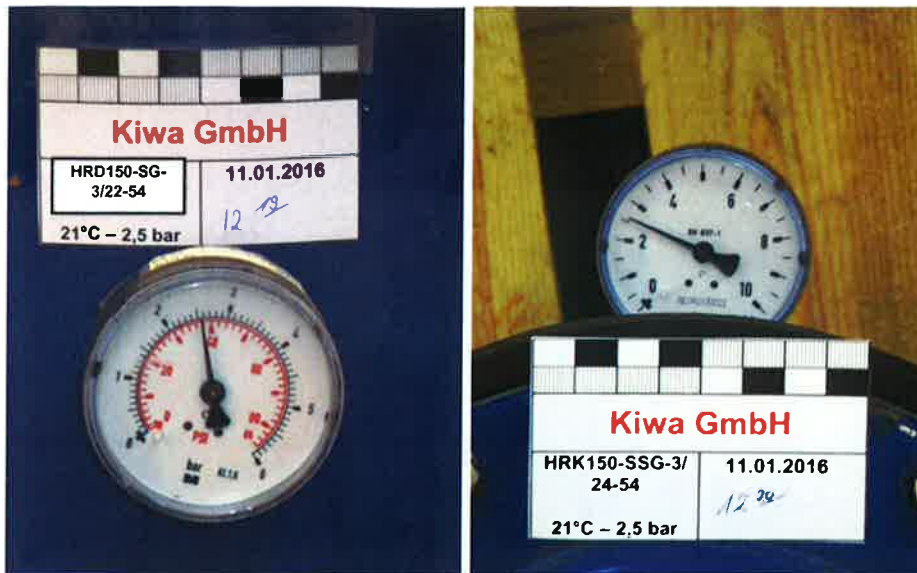


Figure A1. Gas tightness test with the air filled testing cylinder at a nominal pressure of 2,5 bar at 21°C. (Left: manometer display at the beginning of testing with specimen „HRD150-SG-3/22-54“ on 11.01.2016 at 12:19 pm; right: manometer display at the beginning of testing with specimen „HRK150-SSG-3/24-54“ on 11.01.2016 at 12:20 pm).



Figure A2. Gas tightness test with the air filled testing cylinder at a nominal pressure of 2,5 bar at 21°C. (Left: manometer display after 24 hours with test specimen „HRD150-SG-3/22-54“ on 12.01.2016 at 12:34 pm; right: manometer display after 24 hours with test specimen „HRK150-SSG-3/24-54“ on 12.01.2016 at 12:35 pm).





Figure A3. Gas tightness test with the air filled testing cylinder at a nominal pressure of 2,5 bar at 0°C. (Left: manometer display at the beginning of testing with specimen „HRD150-SG-3/22-54“ on 12.01.2016 at 2:26 pm; right: manometer display at the beginning of testing with specimen „HRK150-SSG-3/24-54“ on 12.01.2016 at 2:27 pm).



Figure A4. Gas tightness test with the air filled testing cylinder at a nominal pressure of 2,5 bar at 0°C. (Left: manometer display after 24 hours with test specimen „HRD150-SG-3/22-54“ on 13.01.2016 at 2:30 pm; right: manometer display after 24 hours with test specimen „HRK150-SSG-3/24-54“ on 13.01.2016 at 2:32 pm).

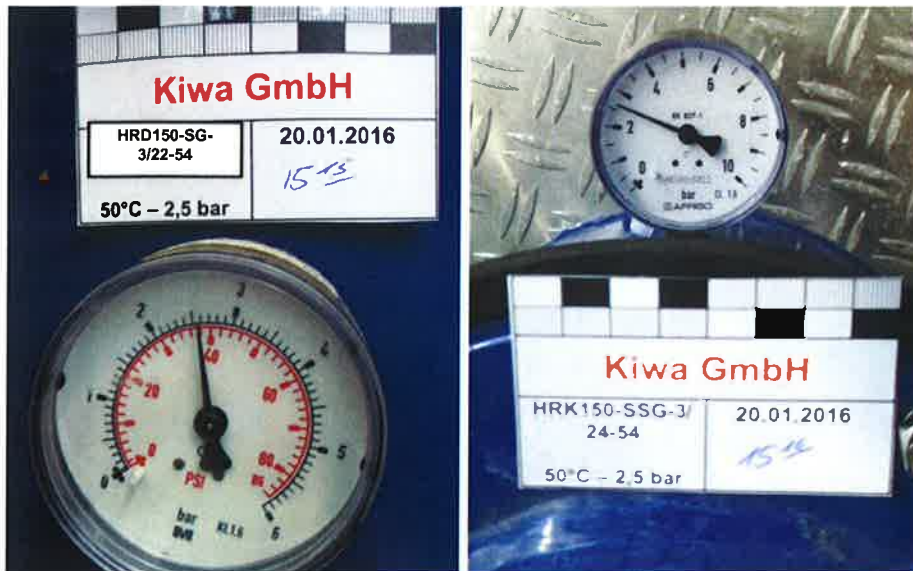


Figure A5. Gas tightness test with the air filled testing cylinder at a nominal pressure of 2,5 bar at 50°C. (Left: manometer display at the beginning of testing with specimen „HRD150-SG-3/22-54“ on 20.01.2016 at 3:15 pm; right: manometer display at the beginning of testing with specimen „HRK150-SSG-3/24-54“ on 20.01.2016 at 3:16 pm).



Figure A6. Gas tightness test with the air filled testing cylinder at a nominal pressure of 2,5 bar at 50°C. (Left: manometer display after 24 hours with test specimen „HRD150-SG-3/22-54“ on 21.01.2016 at 3:36 pm; right: manometer display after 24 hours with test specimen „HRK150-SSG-3/24-54“ on 21.01.2016 at 3:37 pm).