

## TECHNICAL REPORT

# Polywater Hauff PHRD Seal Testing and Certification

May 1, 2020

### UL CERTIFICATION WATER TIGHTNESS, ELASTOMERIC AGING, AND ASSEMBLY ENGINEERING INFORMATION

PHRD Seals are approved for wet and liquid-tight locations under UL Category Control Number (CCN) QCRV, "Outer Bushings and Fittings." The PHRD Seals were investigated to ANSI/UL 514B, "Conduit, Tubing, and Cable Fittings" for use as sealing bushings on rigid metallic conduit. Seals are considered raintight and are intended for use per Article 230.8 and 300.5(G) or other code articles where seals are for ordinary location use.

#### CATALOG CODES AND MARKINGS

PHRD1.5, PHRD2, PHRD2.5, PHRD3, PHRD3.5, PHRD4 Custom Seals  
PHRD4-SGi-4, PHRD5-SGi-4 Super-segmented Seals



#### TEST PROTOCOLS

##### ELASTOMERIC MATERIAL AGING AND HARDNESS ANSI/UL 514B Clause 8.3

For the Elastomeric Material Hardness test, the hardness of the unaged EPDM was determined as an average of 5 readings using either a Shore Durometer or a Rex Hardness Gauge. Six samples of the EPDM elastomer were then conditioned at 100 C for 70 hours. The material hardness was then measured again using the average of 5 readings.

To pass, the hardness shall not be 10 units different and the material shall not show any signs of cracking, discoloration, or aging.

Status: Elastomeric Material (EPDM) passed the aging and hardness testing.

##### WET LOCATION TEST ANSI/UL 514B Clause 8.7

For the Wet Location Test, two samples were tested. Prior to assembly, an absorbent paper was pre-weighed and placed into the nipple enclosure. Finished seals were set up so that the seal was in the focal area of the water spray apparatus containing three spray heads. The assembly was exposed to a constant spray at 34.47 kPa (5 psi) for one hour. As soon as the test was completed the assembly was dried and disassembled. The absorbent paper was removed and reweighed.

To pass, less than 0.1 gram water may pass through the seal.

Status: All seals passed the wet location test.

### ASSEMBLY TEST ANSI/UL 514B Clause 8.27.2

For the Assembly Test, seal is assembled with the smallest and largest flexible cord specified by each seal model. The seal is assembled to the torque specified by the manufacturer as specified in Clause 6.3.3. The final assembly is used for the Wet Location Test.

To pass, seal must have a good appearance with tight fit.

Status: All seals pass the assembly test.

### SHARPNESS OF EDGE TEST UL 870 Clause 6.4 and 6.5; UL 1439

Materials shall not have sharp edges or points that may cause risk of injury during normal installation, maintenance, and use. In this test, the special Sharp-Edge Tester is used with indicator tape. The indicator tape is placed on the edge and the tester is moved over the taped edge at a speed of 2 to 5 seconds over 4 inches (10 cm).

To pass, edge should not cut through more than two layers of the sensing tape.

Status: All seals passed the sharpness of edge test.

## **PRESSURE TESTING – LLOYDS REGISTER INSPECTION CERTIFICATE**

### ENGINEERING INFORMATION

PHRD Seals are gas tight and appropriate for use Class I Division 2 boundary seals described in Article 501.15(B)(1).

PHRD Seal was pressure tested with both air and water. Equipment and calibration equipment were inspected. An Inspection Certificate was issued, no item markings were applied.

### CATALOG CODE AND CERTIFICATION

HRD 150-SG-3/20-54 equivalent to PHRD6-SG-3 (Certification # DTM1820078/2A1)

### TEST PROTOCOL

Segmented seals were pressure tested to 2.5 bar (36 psi) for 72 hours at 22°C.

Status: Seals passed pressure test. Neither leakage nor deformation could be identified after the pressure test.

## ADDENDUM 1 UL TEST CERTIFICATION AND REPORT

# CERTIFICATE OF COMPLIANCE

Certificate Number E515848  
Report Reference E515848-20200529  
Issue Date 2020-JUNE-10

Issued to: AMERICAN POLYWATER CORP  
11222 60th St N  
Stillwater MN 55082

This certificate confirms that  
representative samples of

OUTLET BUSHINGS AND FITTINGS  
Sealing Bushings, Cat. Nos. PHRD1.5, PHRD2, PHRD2.5,  
PHRD3, PHRD3.5, PHRD4, PHRD4-SGI-4 and PHRD5-  
SGI-5.

Have been investigated by UL in accordance with the  
Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 514B - Standard for Conduit, Tubing and Cable Fittings  
Additional Information: See the UL Online Certifications Directory at  
<https://iq.ulprospector.com> for additional information.

This *Certificate of Compliance* does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.



Bruce Mahrenholz, Director North American Certification Program  
UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at <http://ul.com/about/ul/customer-service>



## ADDENDUM 2 – LLOYDS TESTING CERTIFICATE

This certificate replaces certificate number DTM1820078/2 issued on 19.02.2018 which is hereby cancelled

Certificate no: **DTM1820078/2A1**  
Page 1 of 1



### Inspection Certificate

Project: **Witness of Prototype Test by Lloyd's Register**

Client: **Hauff-Technik GmbH & Co. KG Robert-Bosch-Strasse 9  
D-89568 Hermaringen/Germany**

Office: **Hamburg**

Clients Order Number: **500000008/4770**

Date: **07 Mai 2018**

Order Status: **complete**

Inspection Dates

First: **01 Februar 2018**

Final: **12 April 2018**

This certificate is issued to **Hauff-Technik GmbH & Co. KG, Hermaringen/Germany** to certify that the undersigned surveyor did, at their request, attend at their works on the date shown above for the purpose of examining the undemoted equipment:

#### Description of Goods / Services:

#### 1 (ONE) pc. Modular Seal

Seal type:	HRD150-SG-3/20-54	Ident No. 8251001012	
Consisting of:	Lower press plate	1.4307	Ident No. 8280092021
	Upper Press plate	1.4307	Ident No. 8280092020
	Elastomer segment	EPDM 50±5 Shore A	Ident No. 8250001323
	Hexagon nut with flange M6	DIN 6923 / Grade A2	Ident No. 5070040036
	Plain washer 6.4	DIN 125-A / Grade A2	Ident No. 5070030012
	Hexagon socket bolt M6x55\24	DIN 912 / Grade A2	Ident No. 5070020160

Works documentation will be attached by client.

Witness pressure test, test pressure 2,5 bar g, >72 hours, test medium: water /air, ambient temperature 22 °C, Visual inspection for workmanship execution, verify of calibration status of measuring equipment. Neither leakage nor deformation could be identified after the pressure test.

As far as it could be verified, all inspections as listed above have been closed with satisfactory results.

#### Remark:

**No item marking has been applied by Lloyd's Register**

Z.Zarnf   
Surveyor to Lloyd's Register EM EA

A subsidiary of Lloyd's Register Group Limited

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as "Lloyd's Register". Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Form 1123Local (2013.12)

**This is a copy of an electronic document. In the event of any conflict or ambiguity between the copy and the electronic document, which is retained and published by Lloyd's Register, the original electronic and certified version shall always prevail.**