



Marine & Offshore
Division

Certificate number: 43718/A0 BV

File number: ACM 135/2764/3

Product code: 2104I

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

RYCO HYDRAULICS Pty Ltd

Footscray - AUSTRALIA

for the type of product

NON-METALLIC HOSES (FLEXIBLE PIPES) ASSEMBLIES

Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings

acc. to EN 856 4SP / 4SH

Requirements:

- BUREAU VERITAS Rules for the Classification of Steel Ships

This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 11 May 2021

For BUREAU VERITAS,

At BV BRISBANE, on 11 May 2016,

Florin ZAHARIA



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine & Offshore Division available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

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BV Mod. Ad.E 530 October 2014

This certificate consists of 4 page(s)

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings acc. to EN 856 4SP / 4SH

1.1 Design Specifications

EN 856 4SP / 4SH: Oil resistant synthetic rubber inner tube, wire braids reinforcement and oil and abrasion resistant rubber cover.

AVENGER R4SPA	R4SP06A	R4SP08A	R4SP10A	R4SP12A	R4SP16A
DN size (mm)	10	12	16	19	25
Max. Working Pressure (bar)	445	420	380	380	350

DIEHARD R4SPD	R4SP06D	R4SP08D	R4SP10D	R4SP12D	R4SP16D
DN size (mm)	10	12	16	19	25
Max. Working Pressure (bar)	445	420	380	380	350

AVENGER R4SHA	R4SH12A	R4SH16A	R4SH20A	R4SH24A	R4SH32A
DN size (mm)	19	25	31	38	51
Max. Working Pressure (bar)	420	380	350	300	250

DIEHARD R4SHD	R4SH12D	R4SH16D	R4SH20D	R4SH24D	R4SH32D
DN size (mm)	19	25	31	38	51
Max. Working Pressure (bar)	420	380	350	300	250

HSPE ADVANTAGE	HSP08E	HSP10E	HSP12E	HSP16E
DN size (mm)	12	16	19	25
Max. Working Pressure (bar)	420	350	350	320

Temperature range (°C): -40 up to +100

The maximum working pressure is not to exceed one quarter of the burst pressure at the service temperature.

1.2 Materials

Inner tube	Oil resistant CR-NBR rubber (Neoprene), black Oil resistant synthetic rubber
Reinforcement	Layer of steel wire braid
Cover	Oil and abrasion resistant synthetic rubber, black Oil and weather resistant rubber
Coupling	Carbon steel AISI / SAE 12L14 , 1010, 1020, 1040, 1045 (Standard) Electroplated Fe/Zn12c acc. to AS1789 Stainless Steel 316 ASTM A276 or equivalent (Option)

End fittings according to manufacturer's specifications.

When other choices of materials are used per manufacturer's recommendations, the BV agreement is to be obtained.

2. DOCUMENTS AND DRAWINGS

- RYCO Hydraulics Product Technical Manual N° RHY-RHC0707AUS dated 2015
- RYCO Hydraulics Product Technical Manual dated 2013
- RYCO Metric crimp chart and rapid numbers RYCO-MKT0300 document N° RH-WI-61 rev.07 dated 08/12/2015
- RYCO Hydraulics company profile N° RHY-CP0608

No departure from the above documents shall be made without the prior consent of the Society. The manufacturer must inform the Society of any modification or changes to these documents and drawings.

3. TEST REPORTS

3.1 Tests carried out: Burst, change in length, impulse, proof pressure, cold flexibility, oil resistance, abrasion resistance and ozone resistance tests.

- DIEHARD R4SHD test report N° 2435-030 dated 22/12/2015
- AVENGER R4SPA test report N° 2436-030 dated 19/12/2015
- DIEHARD R4SPD test report N° 2437-030 dated 19/12/2015
- Burst pressure test report N° RH-BT-002/13 dated 19/07/2013

3.2 Fire resistance test according to ISO 15540/15541.

- Test report N° RH-FT-126 and RH-FT-128 dated 15/03/2013 witnessed by DNV

4. APPLICATION / LIMITATION

4.1 May be used for the following services on board: Fuel oil, lubricating oil, hydraulic oil, compressed air, fresh water, sea water and sanitary. The hoses may be used for oil fuel supply to burners only with external wire braid protection.

4.2 End fittings as per manufacturer's catalogue. The hoses are to be entirely assembled in the manufacturer's workshop.

4.3 The installation of hose assemblies is to be in accordance with the manufacturer's instructions to take into consideration forces due to vibration. The hoses are not to be used on services when vibration test is required in the Society's Rules.

4.4 The hoses are to be limited to a length necessary to provide for relative movement between fixed and flexibly mounted items of machine/equipment or systems and are only to be used in lengths up to 2 m. The hoses are to be installed in clearly visible and readily accessible locations at all times.

4.5 Taper threaded end connections are not to be used for oil circuits in engine rooms nor any place containing an ignition source unless otherwise suitably screened at the Society's Surveyor satisfaction.

5. PRODUCTION SURVEY REQUIREMENTS

5.1 The products are to be supplied by **RYCO HYDRAULICS Pty. Ltd.** in compliance with the type described in this certificate and in compliance with the requirements stated on the front page of this certificate. This type of product is within the category IBV of Bureau Veritas Rule Note NR320.

5.2 This certificate is also valid for other companies authorised by RYCO HYDRAULICS Pty. Ltd. when same specifications, tolerances, equipment and quality control procedures are used. In such case, the BV agreement is to be obtained.

5.3 Each hose with end fittings is to be hydraulically pressure tested to twice the maximum working pressure and provided with the manufacturer's pressure test report and conformity of production.

5.4 BV product certificate is required.

Places of production

Production site	Location	Hose	Hose couplings	Hose assemblies	Adaptors
RYCO HYDRAULICS Pty. Ltd.	19 Whitehall Street Footscray, VIC 3011 AUSTRALIA		x	x	x
RYCO HYDRAULICS (Dalian) Ltd.	38 Ying Ri Road Ying Cheng Zi Industrial Zone Gan Jing Zi District DALIAN 116036 CHINA		x	x	x
RYCO HYDRAULICS Sdn. Bhd.	Plot 207 Kuala Ketil Industrial Estate 09300 Kuala Ketil Kedah Darulaman MALAYSIA	x		x	
RYCO HYDRAULICS (Dalian) Ltd. Taicang Branch	2nd Building No.88 Dalian East Road Taicang Economy Developing Area Taicang, 215400 Jiangsu Province CHINA			x	
RYCO HYDRAULICS Inc.	1616 Greens Road Houston, Texas, 77032 USA			x	

6. MARKING OF PRODUCT

Each hose assembly shall be at least clearly and indelibly marked with:

- Manufacturer name or logo
- Type designation
- Date of manufacture and lot #
- Society's brand as relevant

7. OTHERS

This approval is given on the understanding that the manufacturer will accept full responsibility for informing shipbuilders or their sub-contractors of the proper method of fitting and general maintenance of the products and of the conditions of this approval.

***** END OF CERTIFICATE *****