



Marine & Offshore
Division

Certificate number: 43719/A0 BV

File number: ACM 135/2764/4

Product code: 2104I

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

www.veristar.com

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 SAE 100R12 / EN 856 R12, SAE 100R13 / EN 856 R13, SAE 100 R15 and SAE 100R5

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.

The electronic version is available at: <http://www.veristarp.com/veristarnb/jsp/viewPublicPdfTypepec.jsp?id=aqthwewxmo>

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 acc. to SAE 100R12 / EN 856 R12, SAE 100R13 / EN 856 R13, SAE 100 R15 and SAE 100R5

1.1 Design specifications of type SAE 100 R12 / EN 856 R12

SAE 100R12: Synthetic rubber inner tube with four alternating layers of spiralled high tensile steel wire reinforcement and resistant rubber cover.

H12	H1206 A/D/S	H1208 A/D/S	H1210 A/D/S	H1212 A/D/S	H1216 A/D/S	H1220 A/D/S	H1224 A/D/S	H1232 A/D/S	H1240 A/D/S
DN (mm)	10	12	16	19	25	31	38	51	63
Max. working pressure (bar)	350	350	350	350	350	275	255	210	140

Temperature range (°C): -40 up to +121

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

1.2 Design specifications of type SAE 100 R13 / EN 856 R13

SAE 100 R13: Synthetic rubber inner tube with four/ six layers of spiralled high tensile steel wire and synthetic resistant rubber cover.

H13	H1312 A/D/S	H1316 A/D/S	H1320 A/D/S	H1324 A/D/S	H1332 A/D/S
DN (mm)	19	25	31	38	51
Max. working pressure (bar)	350	350	350	350	350

Temperature range (°C): -40 up to +121

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

1.3 Design specifications of type SAE 100 R15

SAE 100R15: Synthetic rubber inner tube with four alternating layers of spiralled high tensile steel wire reinforcement and resistant rubber cover.

DIEHARD H15	H1512D	H1516D	H1520D	H1524D	H1532D
DN (mm)	19	25	31	38	51
Max. working pressure (bar)	420	420	420	420	420

Temperature range (°C): -40 up to +121

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

1.4 Design specifications of type SAE 100 R5

SAE 100R5: Polyester inner braid covered with one braid of high tensile steel wire.

SURVIVOR RQP5	RQP54	RQP55	RQP56	RQP58	RQP510	RQP512	RQP516	RQP520	RQP524	RQP532
DN (mm)	5	6	8	10	12	16	22	28	35	46
Max. working pressure (bar)	210	210	155	138	121	103	55	43	35	24

Temperature range (°C): -40 up to + 150

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

TRUCKER T5	T54	T55	T56	T58	T510	T512	T516	T520	T524	T532
DN (mm)	5	6	8	10	12	16	22	28	35	46
Max. working pressure (bar)	210	210	155	138	121	103	55	43	35	24

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.

1.5 Materials

Inner tube	Oil resistant CR-NBR rubber (Neoprene), black
Reinforcement	Layer of steel wire Layer of steel wire with a rubber layer between the spirals Polyester inner braid covered with one braid of high tensile steel wire (RQP5 Survivor)
Cover	Oil and abrasion resistant synthetic rubber, black Oil and weather resistant rubber CSM-CR Blue polyester braid (RQP5 Survivor)
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 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.

- Avenger H12 test certificate N° RHAU-HA-H1206A~H1224A dated 17/10/2013 and 16/12/2013
- Impulse test certificate AVENGER H12, H1224 N° 4770i dated 06/07/2012, DIEHARD H12, H1206 N° 5041i dated 20/11/2012, H1212D N° KP2 047/12 dated 12/08/2012, H1316A AVENGER N° 4638i dated 19/03/2012, H1324D DIEHARD N° 4640i dated 19/03/2012
- Impulse test certificate TRUCKER T54 N° 5049i dated 21/11/2012, RQP55 Survivor N° 5047i dated 21/11/2012, TRUCKER T58 N° 5198i dated 21/11/2012, RQP510 N° 5048i dated 21/11/2012, DIEHARD H15, H1520D N° 4771i dated 20/11/2012, H1524D N° 2764i dated 12/09/2007

3.2 Fire resistance test according to ISO 15540/15541

- DIEHARD H12, H1206A test certificate ° RH-FT-54 dated 06/04/2006, H1224D report N° RH-FT-11 dated 21/07/2005 witnessed by DNV
- SLIDER H12S, H1212S test certificate ° RH-FT-33 dated 29/11/2005 witnessed by DNV
- DIEHARD H13D, H1320D test certificate ° RH-FT-57 dated 07/04/2006, AVENGER H13, H1312A N° RH-FT-30 dated 17/11/2005, AVENGER H13A, H1332A N° RH-FT-49 dated 06/04/2006 witnessed by DNV
- SURVIVOR RQP5 RQP520 test certificate N° RH-FT-47 dated 09/02/2006, RQP512 N° RH-FT-21 dated 15/11/2005 RQP54 N) RH-FT-20 dated 16/11/2005 witnessed by DNV
- DIEHARD H15, H1520D N° RH-FT-58 dated 07/04/2006, H1512D N° RH-FT-41 dated 30/11/2015 witnessed by DNV
- TRUCKER T5 N° RH-FT-129, RH-FT-131 dated 15/03/2013, N° RH-FT-135 dated 19/07/2013 witnessed by DNV
- Fire resistance test report N° IRH-FT-005/13 dated 17/05/2013

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. * When required, only approved fire resistant type (hoses assembled with or without fire sleeve protection) is to be used as per above design specifications.

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 *****