



Marine & Offshore  
Division

Certificate number: 43717/A0 BV

File number: ACM 135/2764/2

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 SAE 100 R2AT, EN 853 2SN and EN 857 2SC

**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 5 page(s)

## THE SCHEDULE OF APPROVAL

### 1. PRODUCT DESCRIPTION

**Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings acc. to SAE 100 R2AT, EN 853 2SN and EN 857 2SC**

#### **1.1 Design specifications**

Oil resistant synthetic rubber inner tube, 2 braids of high tensile steel wire and oil and abrasion resistant rubber cover.

<b>AVENGER T2A</b>	T24A	T25A	T26A	T28A	T210A	T212A	T216A	T220A	T224A	T232A	T240A	T248A
DN (mm)	6	8	10	12	16	19	25	32	38	51	63	76
Max. Working Pressure (bar)	420	350	350	350	250	215	175	140	100	90	70	70

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.

<b>DIEHARD T2D</b>	T24D	T25D	T26D	T28D	T210D	T212D	T216D	T220D	T224D	T232D	T240D	T248D
DN (mm)	6	8	10	12	16	19	25	32	38	51	63	76
Max. Working Pressure (bar)	420	350	350	350	250	215	175	140	100	90	70	70

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.

<b>DIEHARD TXA2D</b>	TXA28D	TXA210D	TXA212D	TXA216D	TXA220D
DN (mm)	12	16	19	25	32
Max. Working Pressure (bar)	375	350	313	225	175

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.

<b>DINFLEX DF2</b>	DF24A/D/S	DF25A/D/S	DF26A/D/S	DF28A/D/S	DF210A/D/S	DF212A/D/S	DF216A/D/S
DN (mm)	6	8	10	12	16	19	25
Max. Working Pressure (bar)	420	350	350	295	250	215	167

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.

<b>SLIDER T2S</b>	T24S	T25S	T26S	T28S	T210S	T212S	T216S	T220S	T224S	T232S
DN (mm)	6	8	10	12	16	19	25	32	38	51
Max. Working Pressure (bar)	420	350	350	350	250	215	175	140	100	90

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.

<b>ADVANTAGE T2E</b>	T24E	T25E	T26E	T28E	T210E	T212E	T216E	T220E	T224E	T232E	T240E
DN (mm)	6	8	10	12	16	19	25	31	38	51	63
Max. Working Pressure (bar)	420	350	350	350	250	215	175	140	100	90	70

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.

<b>ADVANTAGE DF2E</b>	DF24E	DF25E	DF26E	DF28E	DF210E	DF212E	DF216E
DN (mm)	6	8	10	12	16	19	25
Max. Working Pressure (bar)	420	350	350	295	250	215	167

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.

<b>SURVIVOR RQP2</b>	RQP24	RQP25	RQP26	RQP28	RQP210	RQP212	RQP216	RQP220	RQP224	RQP232
DN (mm)	6	8	10	12	16	19	25	32	38	51
Max. Working Pressure (bar)	400	350	350	300	250	215	167	150	100	90

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.

<b>ICEBREAKER T2C</b>	T24C	T25C	T26C	T28C	T210C	T215C	T216C	T220C	T224C	T232C
DN (mm)	6	8	10	12	16	19	25	31	38	51
Max. Working Pressure (bar)	420	350	350	350	250	215	175	140	100	90

Temperature range (°C): -50 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 synthetic rubber
Reinforcement	two steel wire braids
Cover	Oil and abrasion resistant synthetic rubber, black Oil and weather resistant rubber Oil and abrasion resistant synthetic rubber, sheathed with polyethylene
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.

- Dimension control and physical test for ADVANTAGE T2E, T24E, T26E, T28E, T210E, T212E, T216E, T220E and for ADVANTAGE DF2E, DF24E, DF26E, DF28E, DF210E, DF212E, DF216E dated 08/09/2010
- Dimension control and physical test for SLIDER T2S, T24S dated 30/12/2011 and T28S dated 23/06/2012
- AVENGER T2A impulse certificate N° KP2 061//1 for T24A dated 10/07/2011 N° KP2 029/11 for T28A dated 11/04/2011, N° 4718i for T224A dated 17/05/2012
- Impulse certificate DF26A N° 4745i and DF212A N° 4747i date 20/11/2012
- Impulse certificate RQP24 N° 2775i dated 17/09/2007, RQP220 N°2646i dated 22/03/2007, RQP216 N° 5046i and RQP28 N° 5045i dated 20/11/2012
- DIEHARD TXA2D test report N° 2446-030 and 2445-030 dated 16/12/2015
- ICEBREAKER T2C report N° 2442-030 dated 16/12/2015
- AVENGER T2A report N° RHAU-TA-T210A~T216A dated 16/09/2013

### 3.2 Fire resistance test according to ISO 15540

- Slider T2S, T24S test certificate N° RH-FT-43, T28S report N° RH-FT-42, T216S N° RH-FT-44 dated 09/02/2006 witnessed by DNV

- ADVANTAGE T2E, T24E test certificate N° RH-FT-79, T26E report N° RH-FT-80, T212E N° RH-FT-81 dated 23/09/2010 witnessed by DNV

- ADVANTAGE DF2E, DF26E test certificate N° RH-FT-74, DF28E report N° RH-FT-75, DF212E report N° RH-FT-76 dated 23/09/2010 witnessed by DNV

- SURVIVOR RQP2 RQP24 test certificate N° RH-FT-35 dated 29/11/2005, RQP212 report N° RH-FT-25 dated 16/11/2005, RQP232 report N° RH-FT-40 dated 30/11/2005 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.

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

**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 \*\*\***