



Marine & Offshore  
Division

Certificate number: 43613/A0 BV

File number: ACM 135/2764/1

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 R1AT, EN 853 1SN and EN 857 1SC

**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 100R1AT, EN 853 1SN and EN 857 1SC**

#### **1.1 Design Specifications**

Oil resistant synthetic rubber reinforced with one braid of high tensile steel wire, cover of oil and abrasion resistant synthetic rubber.

<b>AVENGER T1A</b>	T13A	T14A	T15A	T16A	T18A	T110A	T112A	T116A	T120A	T124A	T132A
DN (mm)	5	6	8	10	12	16	19	25	31	38	51
Max. Working Pressure (bar)	250	225	215	180	160	130	105	90	65	50	40

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 T1D</b>	T13D	T14D	T15D	T16D	T18D	T110D	T112D	T116D	T120D	T124D	T132D
DN (mm)	5	6	8	10	12	16	19	25	31	38	51
Max. Working Pressure (bar)	250	225	215	180	160	130	105	90	65	50	40

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 T1S</b>	T13S	T14S	T15S	T16S	T18S	T110S	T112S	T116S	T120S	T124S	T132S
DN (mm)	5	6	8	10	12	16	19	25	31	38	51
Max. Working Pressure (bar)	250	225	215	180	160	130	105	90	65	50	40

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>DF1</b>	DF14E/D	DF15E/D	DF16E/D	DF18E/D	DF110E/D	DF112E/D	DF116E/D
DN (mm)	6	8	10	12	16	19	25
Max. Working Pressure (bar)	225	215	180	160	130	105	88

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>T1F Fire suppression</b>	T13F	T14F	T15F	T16F	T18F	T110F	T112F	T116F
DN (mm)	5	6	8	10	12	16	19	25
Max. Working Pressure (bar)	250	225	215	180	160	130	105	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 T1E</b>	T13E	T14E	T15E	T16E	T18E	T110E	T112E	T116E	T120E	T124E	T132E
DN (mm)	5	6	8	10	12	16	19	25	31	38	51
Max. Working Pressure (bar)	250	225	215	180	160	130	105	90	65	50	40

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 RQP1</b>	RQP14	RQP15	RQP16	RQP18	RQP110	RQP112	RQP116
DN (mm)	6	8	10	12	16	19	25
Max. Working Pressure (bar)	225	215	180	160	130	120	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.

## 1.2 Materials

Inner tube	Black, Oil resistant synthetic rubber
Reinforcement	One steel wire wire braid of high tensile steel wire acc. to SAE 100R1
Cover	Black, 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 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: Dimensional control and physical test, burst pressure test at 4 times the maximum working pressure, impulse test, proof pressure, cold flexibility, oil resistance, abrasion resistance, visual inspection and ozone resistance tests.

- ADVANTAGE DF1E, DF14E, ADVANTAGE T1E, T18E, T116E, T132E test reports dated 08/09/2010
- Report on burst pressure for model DF14E test report N° EB0D1/KK dated 23/09/2010 witnessed by DNV
- Impulse test certificate N° KP3 010/11 for AVENGER T1A, T14A dated 21/02/2011
- Impulse test certificate N° 4763i for DIEHARD T1D, T18D dated 20/11/2012
- Impulse test certificate N° 4796i for AVENGER T1A, T112A and N° 4083i for AVENGER T1A, T124A dated 15/08/2012
- Impulse test certificate N° 2671i for SURVIVOR RQP1, RQP112 dated 05/04/2007, N°5043i for RQP14 dated 20/11/012, N°5044i for RQP18 dated 20/11/2012
- Dimensional control and physical test for T1F Fire suppression, T14F, T18F, T112F dated 2012
- T1F Fire suppression certificate N° 2441-030 dated 16/12/2015
- SURVIVOR RQP1 test certificate N° 2438-030 dated 17/12/2015
- AVENGER T1A test reports N° RHAU-TA-T14A~T112A dated 16/09/2013
- DIEHARD T1D test report N° RHAU-TD-T120D dated 11/07/2014
- ADVANTAGE DF1E test report dated 22/01/2016

3.2 Fire resistance test according to ISO 15540

- ADVANTAGE DF1E, DF14E test certificate N° RH-FT-72 dated 23/09/2010 witnessed by DNV
- ADVANTAGE DF1E, DF18E test certificate N° RH-FT-73 dated 23/09/2010 witnessed by DNV
- Fire suppression T1F, T18F test certificate N° RH-FT-29 dated 17/11/2005 witnessed by DNV
- Fire suppression T1F, T14F test certificate N° RH-FT-31 dated 29/11/2005 witnessed by DNV
- Fire suppression T1F, T112F test certificate N° RH-FT-32 dated 29/11/2005 witnessed by DNV
- ADVANTAGE T1E, T14E, T18E, T112E test certificate N° RH-FT-77 dated 23/09/2010 witnessed by DNV
- SURVIVOR RQP1, RQP14 test certificate N° RH-FT-22 dated 17/11/2005, RQP18 report N° RH-FT-23 dated 16/11/2005, RQP116 report N° RH-FT-24 dated 16/11/2005 witnessed by DNV
- DF1 test certificate N° RH-FT-137 dated 19/07/2013 witnessed by DNV

**4. APPLICATION / LIMITATION**

- 4.1 May be used for the following services on board: Hydraulics systems, compressed air, fresh water and sanitary systems.
- 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 \*\*\***