



Marine &amp; Offshore

Certificate number: 43717/B2 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*

**Manuli Ryco Hydraulics Sdn Bhd**  
KEDAH - MALAYSIA

*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 Marine & Offshore 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: 25 Jun 2026**

For Bureau Veritas Marine & Offshore,  
At BV KUALA LUMPUR, on 11 Dec 2024,  
Muhammad Norsi

***This certificate was created electronically and is valid without signature***



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 Marine & Offshore. 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 available on the internet site [www.veristar.com](http://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 Marine & Offshore 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 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>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>	DF24D	DF25D	DF26D	DF28D	DF210D	DF212D	DF216D
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>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.

DIEHARD DK2D/S	DK24D/S	DK25D/S	DK26D/S	DK28D/S	DK210D/S	DK212D/S	DK216D/S	DK220D/S
DN (mm)	6	8	10	12	16	19	25	31
Max. Working Pressure (bar)	450	420	385	345	290	280	200	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.

## 1.2 - Materials

Part	Material
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 metric crimp chart and rapid numbers RYCO-MKT0300 document N° RH-WI-61 rev.09 dated 21/12/2021
- 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 SLIDER T2S, T24S dated 30/12/2011 and T28S dated 23/06/2012
- 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
- Test report including dimensional check, cover adhesion test, proof pressure test at 2 times the design pressure, leakage test, cold flexibility test, ozone resistance test and oil resistance test for model DK2D dated 29/04/2019
- Burst pressure test report N°RH-BT-003/18 dated 18/10/2018 for the model DK2D

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
- 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
- Fire resistance test carried on flexible hoses assemblies type DK2D witnessed by DNV dated 18/10/2018

#### **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 - Flexible hoses assemblies for essential services or containing either flammable or toxic media are not to exceed 1.5 meters in length.

4.4 - The hoses assemblies are to be installed according to manufacturer's instructions and Bureau Veritas Rules.

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

4.6 - Not to be used in case of high level of vibrations where fitted to engines, pumps, compressors and other sources of high vibrations.

#### **5. PRODUCTION SURVEY REQUIREMENTS**

5.1 - The products are to be supplied by **Manuli Ryco Hydraulics Sdn Bhd**, in compliance with the type and the requirements described in this certificate.

5.2 - This type of product is within the category IBV of Bureau Veritas Rule Note NR320.

5.3 - BV product certificate is required.

5.4 - Each hose with end fittings is to be hydraulically pressure tested to 1.5 times the maximum working pressure and provided with the manufacturer's pressure test report and conformity of production.

5.5 - For information, **Manuli Ryco Hydraulics Sdn Bhd**, has declared to Bureau Veritas the following production sites:

Production site	Location	Hose	Hose couplings	Hose assemblies	Adaptors
<b>Fluiconnecto Ryco Australia Pty Ltd</b>	<b>99 Calarco Drive Derrimut AUSTRALIA</b>		<b>x</b>	<b>x</b>	<b>x</b>
<b>Manuli RYCO Hydraulics (Dalian) Co. 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>Manuli 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>Fluiconnecto USA</b>	<b>1207 Rankin Rd, 77073 HOUSTON UNITED STATES OF AMERICA</b>			<b>x</b>	
<b>Manuli Hydraulics (Suzhou) Co., Ltd.</b>	<b>No.85 Xinglin Street, Suzhou Industrial Park, Suzhou, Jiangsu Province, China</b>	<b>x</b>		<b>x</b>	

## **6. MARKING OF PRODUCT**

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

- Manufacturer name or logo
- Date of manufacture (month/year)
- Type designation
- Nominal Diameter
- Pressure rating
- Temperature rating
- Society's brand as relevant

## **7. OTHERS**

It is **Manuli Ryco Hydraulics Sdn Bhd.**'s responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

*This certificate supersedes the Type Approval Certificate No. 43717/B1 BV issued by the Society.*

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