



TYPE APPROVAL CERTIFICATE

Certificate no.:
TAP00001SH
Revision No:
1

This is to certify:

that the **Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings**

with type designation(s)
TEFLON RTH1

issued to

Manuli RYCO Hydraulics Sdn. Bhd.
Kuala Ketil, Kedah, Malaysia

is found to comply with
DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021
DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV class programme DNV-CP-0183 – Type approval – Flexible non-metallic hoses

Application:

Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV.

Temperature range: See page 2

Max. working press.: 55 to 105 bar (see page 2)

Sizes: DN6, 10, 12, 16, 19, 25

Issued at **Høvik** on **2024-11-21**

This Certificate is valid until **2028-12-30**.

for **DNV**

DNV local unit: **Melbourne**

Approval Engineer: **Sarah Miller**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Form code: TA 251

Revision: 2023-09

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Product description

TEFLON RTH1 – RYCO proprietary flexible rubber hoses with permanently attached couplings in accordance with Type A SAE100R14 from SAE J517 having the following construction:

Hose inner tube	:	TEFLON (PTFE)
Reinforcement & cover	:	One braid of high tensile AISI 304 stainless steel wire which also acts as a cover
End fittings	:	ONE PIECE CRIMP TT000 series
Material for end fittings	:	Carbon steel - AS1443 grades 12L14, 1010, 1020, 1040 & 1045 Stainless steel - ASTM A276 type 316
Fire protection	:	Fire sleeve FS1072

Hose and fire sleeve manufacturing location:

- Kongsberg Automotive, West Yorkshire, U.K.

End fittings manufacturing location:

- Manuli RYCO Hydraulics (Dalian) Co., Ltd.
- Manuli Hydraulics Polska S.A.

Hose assembling location:

- Manuli RYCO Hydraulics Sdn. Bhd.
- Manuli RYCO Hydraulics (Dalian) Co., Ltd.
- Manuli Hydraulics (Suzhou) Co., Ltd.

Application/Limitation

This certificate is valid for the specific assembly of hose and coupling type as specified, assembled and delivered by the holder (named as manufacturer) of this certificate.

Hose assemblies covered by this certificate are approved to be used in:

- petroleum based hydraulic fluids (-40°C to +260°C);
- water based Hydraulic fluids, water and air (-40°C to +70°C)

Max. allowable working pressures (MAWP):

RTH1	Hose size			MAWP		End fitting designation
	DN	Inch	Dash	bar	psi	
RTH14	6	1/4	-04	105	1500	TT000
RTH16	10	3/8	-06	105	1500	TT000
RTH18	12	1/2	-08	56	800	TT000
RTH110	16	5/8	-10	56	800	TT000
RTH112	19	3/4	-12	56	800	TT000
RTH116	25	1	-16	55	800	TT000

At elevated temperatures the maximum allowable pressure shall be reduced as follows:

Temperature range		Percentage of MAWP reduction
(°C)	(°F)	(%)
-40°C to +100°C	-40°F to +212°F	100
+101°C to +150°C	+214°F to +302°F	93
+151°C to +200°C	+304°F to +392°F	85
+201°C to +250°C	+394°F to +482°F	77
+251°C to +260°C	+484°F to +500°F	70

Hose assemblies for fire safe applications shall always be installed with fire sleeve as specified in this certificate.

Flexible hoses are only to be used in short lengths where it is necessary due to vibrations or flexible mounting of the machinery. The hoses shall not replace/be used where permanent piping is possible/required.

The hose assemblies must only be fitted in places where they are always accessible. Flexible hoses of these types are not to be used on boiler fronts.

Hose assemblies covered by this certificate shall not be used in system subject to pressure below atmospheric or vacuum condition.

The outer end of the pipe coupling (performing the connection to the fixed piping) is not covered by this certificate and shall follow the below requirements:

- Flanged ends shall be according to a recognized standard

- Slip-on threaded joints having pipe threads where pressure-tight joints are made on the threads with parallel or tapered threads, shall comply with requirements of a recognized standard. Limitations stated in DNVGL-RU-SHIP Pt.4 Ch.6 Sec.9 [5.2.6] to be followed.
- If these outer ends are going to be part of a mechanical joint as covered by Table 10 DNVGL-RU-SHIP Pt.4 Ch.6 Sec.9, then they shall be separately type approved.

Production testing

All hose assemblies delivered under the DNV GL type approval scheme shall be subject to a pressure test at 1.5 times the maximum working pressure and shall be delivered with the pressure test report with reference to this type approval certificate.

Type Approval documentation

Tests carried out

Impulse test, fire test, Dimensional check test, change in length test, Burst test, Leakage test, specific gravity test (Type A SAE100R14)

Marking of product

Flexible hoses are to be permanently marked by the manufacturer with the following details:

- Hose manufacturer's name or trademark;
- Date of manufacture (month/year);
- Designation type reference;
- Nominal diameter;
- Pressure rating;
- Temperature rating.

Periodical assessment

This certificate is only valid if required periodical assessments are carried out with satisfactory results.

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNV-CP-0338.

To check the validity of this certificate, please look it up at <https://approvalfinder.dnv.com>.