

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings**with type designation(s)
Textile M2

Issued to

RYCO Hydraulics Pty. Ltd.
Derrimut, VIC, Australia

is found to comply with

DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses**Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.****Temperature range:** -40°C to +100°C (see page 2)
Max. working press.: 52 to 86 bar (size dependant, see page 2)
Sizes: DN 6, 10, 12 and 19Issued at **Høvik** on **2020-02-24**for **DNV GL**This Certificate is valid until **2023-12-31**.DNV GL local station: **Melbourne**Approval Engineer: **Maheshraja Venkatesan**

Zeinab Sharifi
Head of Section

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.



Product description

TEXTILE M2 - flexible rubber hoses with permanently attached couplings according to SAE 100R3 with the following construction:-

- Hose inner tube : Oil resistant synthetic rubber (Nitrile)
- Reinforcement : Two textile braids
- Hose cover : Oil and weather resistant rubber (black)
- End fittings : BITELOK NON-SKIVE T4000 series
- Material for end fittings : Carbon steel - AS1443 grades 12L14, 1010, 1020, 1040 & 1045
Stainless steel - ASTM A276 type 316

Hose manufacturing location:

- SEL Polimer Kaucuk, Istanbul, Turkey

End couplings manufacturing location:

- RYCO Hydraulics, Victoria, Australia
- RYCO Hydraulics (DALIAN), P.R.China

Hose assembling location:

- RYCO Hydraulics, Victoria, Australia

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 +100°C),
- water based Hydraulic fluids (-40°C to +70°C)
- water and air (0°C to +70°C)

Max. allowable working pressures (MAWP):

Textile M2	Hose size ID			MAWP		End fitting designation (Bitelok)
	DN	Inch	Dash	psi	bar	
M24	6	¼	-4	1250	86	T4000
M26 ⁽¹⁾	10	3/8	-6	1125	78	T4000
M28 ⁽¹⁾	12	½	-8	1000	70	T4000
M212	19	¾	-12	750	52	T4000

- ⁽¹⁾ M26 and M28 are not allowed to be used in piping systems for flammable media or sea water systems where failure may result in flooding, except in cases where such hoses are installed on open decks, as defined in SOLAS II-2/Reg. 9.2.3.3.2.2(10) and not used for fuel oil lines.

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 cover of hoses for gaseous applications shall be pin-pricked.

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

<u>Document No.</u>	<u>Rev.</u>	<u>Title</u>
-	-	Authorization letter from SEL dated 22.05.2019
-	-	'RYCO Product Technical Manual'
1565	-	Burst test report witnessed by DNV Surveyor
28913076	-	DNV Inspection and Testing Report dated 2009-04-17
3089	-	Burst test report witnessed by DNV Surveyor
L08-0148	-	SEL Test report dated 2008-03-12
L04-0758	-	SEL test report dated 2004-12-18
L06-0161; L06-0160	-	SEL test reports dated 2006-03-27
L09-0322	-	SEL test report dated 2009-05-27
KK12-2186; KK12-2187; KK12-2188; KK12-2189	-	SEL test report dated 2012-11-15
KK19-0556; KK19-0555; KK19-0554; KK19-0553; KK19-0550; KK19-0549; KK19-0548	-	SEL hose test reports
RH-FT-27	-	Fire test report witnessed by DNV Surveyor dated 2005-11-16
RH-FT-28	-	Fire test report witnessed by DNV Surveyor dated 2005-11-16
5789i	-	Impulse test certificate dated 2013-06-03
5788i	-	Impulse test certificate dated 2013-06-03
RH-WI-83	8	Hose and coupling Assembly instructions dated 29/11/2017
RH-WI-61	09	RYCO – Metric Crimp Chart and Rapid Numbers dated 2017-12-21
5378	-	Report on burst pressure test witnessed by GL Surveyor dated 2013-02-20
20181024	-	Renewal burst test report witnessed by DNV GL Surveyor dated 2018-11-02

Tests carried out

As per DNVGL-CP-0183 Sec.2 Table 1 and 2 (except vacuum testing)

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

For retention of the Type Approval, a DNV GL 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 DNVGL-CP-0338.