

TYPE APPROVAL CERTIFICATE

This is to certify:

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

with type designation(s)

H13D, H13A

Issued to

RYCO Hydraulics Pty. Ltd.
FOOTSCRAY VICTORIA, Australia

is found to comply with

Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"
Offshore Standard DNV-OS-D101, Marine and Machinery Systems and Equipment
Det Norske Veritas' Standards for Certification 2.9 No. 5-791.70

Application :

May be used for hydraulic oil, fuel oil , lubricating oil, compressed air, fresh water, sea water and compressed air systems.

Temperature range: -40°C to +121°C
Max. working press.: 350 bar (dependent on size)
Sizes: DN20, 25, 32, 40 and 50

This Certificate is valid until **2018-12-31**.

Issued at **Høvik** on **2014-11-12**

for **DNV GL**

DNV GL local station: **Melbourne**

Approval Engineer: **Tom Berg-Nielsen**

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Marianne Spæren Marveng
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. If any person suffers loss or damage which is proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million. In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

Certificate No: **P-14691**
 File No: **791.70**
 Job Id: **262.1-015853-1**

Product description

Type according to SAE 100 R13, prEN 856/R13.

The H1332A/D hoses are manufactured by Wellcall, Bhd, Malaysia
 The rest of the sizes are manufactured by Diesse, Italy

Design:

Inner tube oil resistant CR-NBR rubber

Cover weather and oil resistant CSM-CR.

The hoses sizes -12 & -16 are reinforced with 4 layers

and sizes -20 to -32 with 6 layers of steel wire with a rubber layer between the spirals.

Couplings are made from carbon steels:

AS 443/12L14, appr. equivalent to AISI 12L14

AS1443/D13 (=BS970 230M07 leaded and/or SAE J1403)

AS1443/T13 (=W.no 1.0718 9SMnPb28)

1010, 1020, 1040, 1045

Stainless steel 316 grade ASTM A276 or equivalent.

Coupling manufacturer:

RYCO Hydraulics, Footscray, Victoria 3011, AUSTRALIA

RYCO Hydraulics (DALIAN) Ltd., P.R.China

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 assemblers other than the certificate holder (manufacturer), shall be authorized by a written authorization from the certificate holder to deliver under this Type Approval. The hoses assemblies shall be in compliance with an assembly procedure issued by the certificate holder. The assembler's qualification shall be documented by burst testing of the hose assemblies. The extent of testing is to be decided between the assembler and the local DNV surveyor.

May be used for hydraulic, fuel oil, lubricating oil, compressed air, fresh water, sea water and compressed air systems.

Max Working Pressure (MAWP), depending on nominal inner diameter (ID):

H13A	Hose size inner diameter			Working pressure		Coupling
	DN	Inch	Dash	Bar	Psi	Bitelok
H1312A	20	3/4	-12	350	5100	T9000 non skive
H1316A	25	1	-16	350	5100	T9000 non skive
H1320A	32	1.1/4	-20	350	5100	T9000 non skive
H1324A	40	1.1/2	-24	350	5100	T9000 non skive
H1332A	50	2	-32	350	5100	T9000 non skive

Max Working Pressure (MAWP), depending on nominal inner diameter (ID):

H13D	Hose size inner diameter			Working pressure		Coupling
	DN	Inch	Dash	Bar	Psi	Bitelok
H1312D	20	3/4	-12	350	5100	T9000 non skive
H1316D	25	1	-16	350	5100	T9000 non skive
H1320D	32	1.1/4	-20	350	5100	T9000 non skive
H1324D	40	1.1/2	-24	350	5100	T9000 non skive
H1332D	50	2	-32	350	5100	T9000 non skive

Temperature range: - 40°C to +121°C.

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Each hose assembly is before delivery to be hydraulic pressure tested to 1.5 times the working pressure, and delivered with the manufacturer's/assemblers pressure test report and CoC (certificate of compliance) with reference to this Type Approval Certificate.

Flexible hoses are only to be used where it is necessary due to vibrations or flexible mounting of the machinery. They are not to be used where fixed piping is possible/required.

The hoses must only be fitted in places where they are always accessible.

The hoses are to be mounted in accordance with the manufacturer's instructions.

It must be possible to shut off from the system all flexible hoses used in systems for compressed air, lubricating oil, fuel oil and petroleum base hydraulic oil.

Hose assemblies with couplings made of carbon steel are not to be used at temperatures below -10°C unless the material is normalized.

The hoses can be used in short lengths in the systems mentioned on the front page. They are not to be used where fixed piping is possible/required.

For use with compressed air or gases, the cover of the hose has to be prickled.

This approval does not cover hydraulic and/or pneumatic power and control systems for steering gears.

Type Approval documentation

Reference documents for H13D:

- Qualification test reports witnessed by DNV.
- DNV Inspection and Testing Report TAR 0361-492 dated 30. July 1992.
- Ryco impulse test certificates no. 557 dated 11.12.96, 852 dated 07.09.98 and 855 dated 22.09.98.
- Ryco burst test report no. 878 dated 27.10.98 witnessed by DNV Melbourne.
- Ryco catalogue "Product technical Manual RHC-9611 Quality Hose and Fittings"

Reference documents for TA new hose H13A:

- RYCO Burst test report No. 1567, witnessed 2003-04-03
- RYCO Impuls test report No 1217i dated 2000-11-14 (H1316A).
- Hose manufacturer reports No. 59, 61, 66 and 68

DNV Inspection and Testing Report TAR 28913076 dated 2009-04-17 (with attached Test Certificate No. 3089)

Tests carried out

Dimensional check, Change in length, Burst test, Impulse test, Oil Resistance, Ozone Resistance, Cold Flexibility, Fire test (Ref. MED-B-3625) .

Marking of product

For traceability to this type approval the products are marked:

- Ryco
- Specification or hose name
- Hose size (inside diameter in inches)
- Date code (quarterly and daily production code)

photoengraved 40µ in the hose cover. The imprint is filled with indelible ink.

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Periodical assessment

For retention of the Type Approval, DNV Surveyor shall perform a survey every second year, to verify that the conditions for the type approval are complied with and to witness the following tests on a selection of sizes:

- Dimensional check.
- Change in length
- Leakage test
- Burst test

The tests shall be performed in accordance with procedures given in Det Norske Veritas' Standard for Certification no. 2.9, 5-791.70, "Type Approval of Flexible Hoses of Non-Metallic Material".

The tests are to be performed with the type of couplings fitted that are Type Approved with the hoses.

END OF CERTIFICATE