



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **P-14552**

This is to certify that the
Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings

with type designation(s)
Aeroquip GH663 and GH466 and GH506

Manufactured by
OLEODINAMICA TOSCANA SRL
SERRAVALLE PISTOIESE PT, Italy

is found to comply with
Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Standards for Certification 2.9 No. 5-791.70

Application

The hoses can be used in short lengths in the following systems on board: Fuel and Lube Oil, Water, Steam, Compressed air, Sanitary and Cooling water. They are not to be used where fixed piping is possible/required.

Temperature range: -40 to + 120°C
Max. working press.: Dependent on hose type and size, see cert.
Sizes: -03, -04, -05, -06, -08, -10, -12, -16, -20, -24 and -32

This Certificate is valid until **2015-06-30**.

Issued at **Høvik** on **2013-10-08**

DNV local station: **Milan**

Approval Engineer: **Tom Berg-Nielsen**

for **Det Norske Veritas AS**

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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 proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

Product description

GH663:

Hose design:

According to 1SN. Inner tube of NBR, 1 wire braid reinforcement, synthetic rubber cover

GH466:

Hose design

According to SAE 100 R15. Inner tube of NBR.6 high tensile spiral wire layer reinforcement. Synthetic rubber cover.

GH506:

Hose design:

According to DIN EN856/4SH. Inner tube of NBR, 4 layers of spiral wire as reinforcement, Cover of CR.

Couplings

For hose type GH466: Type 1Wxxxxxx and 1Sxxxxxx in stainless steel.

For hose type GH506: Type 1Wxxxxxx with socket type 1WAxx

Manufactured by Oleadinamica Toscana

Aeroquip hose production site:

Eaton Fluid Power GmbH

Auefeld 1 – Hann. Münden - Germany

Application/Limitation

The hoses can be used in short lengths in the following systems on board: Fuel and Lube Oil, Water, Steam, Compressed air, Sanitary and Cooling water.

Max Working Pressure (MWP), GH663, depending on nominal inner diameter (ID):

Part number	Hose ID		MAWP bar
	mm		
GH663-03	5		250
GH663-04	6.4		225
GH663-05	7.9		225
GH663-06	9.5		110
GH663-08	12.7		175
GH663-10	15.9		140
GH663-12	19.0		125
GH663-16	25.4		90
GH663-20	31.8		65
GH663-24	38.1		50
GH663-32	50.8		40

GH 466 Max Working Pressure, dependent in nominal inner diameter (ID)

Part number	Hose ID		MWP	
	inches	mm	psi	bar
GH466-20	1 1/4"	31	6090	420
GH466-24	1 1/2 "	38	6090	420
GH466-32	2"	51	6090	420

Part number	Hose ID		MWP	
	inches	mm	psi	bar
GH506-16	1"	25	6090	420
GH506-20	1 ¼"	31	5075	350
GH506-24	1 ½"	38	4350	300

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.

All hose assemblies delivered under this type approval certificate shall be in compliance with an assembly procedure issued by the certificate holder.

Each hose assembly is before delivery to be hydraulic pressure tested to 1.5 times the maximum working pressure.

Hose assemblies delivered from the certificate holder shall be delivered with the following documentation:
- Pressure test report with reference to the type approval certificate.

The hose assemblies covered by this type approval may be assembled and delivered by other than the certificate holder under the conditions described in DNV type approval programme 5-791.70.

Hoses used for continuous operation at temperatures higher than 100°C will have their lifetime reduced. In such cases more frequent inspections and planned exchange should be a part of the maintenance program.

Flexible hoses are only to be used in lengths up to 2 meters 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 hoses must only be fitted in places where they are always accessible.

Flexible hoses of these types are not to be used on boiler fronts.

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

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

It must be possible to shut off from the system all flexible hoses used in systems for compressed air, lube, 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.

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

Hoses used in fuel oil lines shall not be installed above or near units of high temperature or sources of ignition. They shall be shielded or otherwise suitably protected to arrest oil spray or leakages. The number of hoses in such piping systems shall be kept to a minimum.

Manufacturer's instructions regarding handling/ installation are to be followed. The hoses are not to be bent more than the minimum bending radius and not to be twisted.

Type Approval documentation

Oleadinamica Toscani project documentation for GH663 and GH466
Eaton-Aeroquip catalogues EA005J and EA011H
Eaton assembly specification AGN600 for GH663 and GH466
Burst test report no. SPS/0058/11 performed by OMECO srl on GH466-20
Burst test report no. SPS/0059/13 performed by OMECO srl dated 22/03/2013 on GH506
Burst test report no. SPS/0045/11 performed by OMECO srl on GH663-32
Fire test report no. 305/11/AC performed by LAPI spa on GH466-20
Fire test report no. 306/11/AC performed by LAPI spa on GH466-24
Fire test report no. 307/11/AC performed by LAPI spa on GH663-32
Fire test reports nos. 341.ISO110/13 and 342.ISO110/13 performed by LAPI spa on 15/03/2013 on GH506
Impulse test no. 20130328-01 performed by the manufacturer on GH506 dated 28/03/2013
Impulse test no. 20110202-05 performed by Venturi sas on GH466-20
Impulse test no. 20110202-06 performed by Venturi sas on GH4663-32

Tests carried out

Proof test, leakage test, burst test, cold flexibility test and fire test.

Marking of product

For traceability to this type approval, the hoses should at least be marked with:

- Manufacturer's trade mark
- Type designation

Certificate Retention Survey

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' Certification Notes no. 2.9 – 5-791.70, "Type Approval of Flexible Hoses of Non-Metallic Material", or another recognised standard.

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

END OF CERTIFICATE