

TYPE APPROVAL CERTIFICATE

This is to certify:

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

with type designation(s)

ABT5K LEADER SUPERTUFF/ MINETUFF

issued to

Alfagomma Hydraulic S.p.A.
Castelnuovo Vomano – Castellalto, TE, Italy

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.6 Piping systems

DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021

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: -40°C to +120°C (see page 2)

Max. working press.: 350 bar(g)

Sizes: DN 06, DN 20 and DN 38

Issued at **Høvik** on **2024-04-26**

This Certificate is valid until **2029-04-25**.

for **DNV**

DNV local unit: **Italy/Malta CMC**

Approval Engineer: **Maheshraja Venkatesan**

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.



Product description

ABT5K LEADER non-metallic hose with permanently attached couplings designed according to ISO 17852 Type DC comprising of following construction:

- Tube : synthetic rubber resistant to hydraulic oil
- Reinforcement : 4-high tensile steel spirals for sizes DN06 & DN20;
6-high tensile spirals for size DN38
- Cover : **MINETUFF** - synthetic rubber resistant to oil, abrasion, ozone and weather (or)
SUPERTUFF - synthetic rubber resistant to oil, abrasion, ozone and weather
- Fittings : C18S one piece fittings (No skive) with carbon steel material grade 11SMnPb30

Hose Manufacturer

Alfagomma Hydraulic S.p.A., Castelnuovo Vomano – Castellalto, TE, Italy

Coupling Manufacturer

Alfagomma Hydraulic S.p.A., Castelnuovo Vomano – Castellalto, TE, Italy

Hose assembling locations

- 1) Alfagomma Hydraulic S.p.A., Castelnuovo Vomano – Castellalto, TE, Italy
- 2) Dunlop Hiflex AS, Buråsen 7, 4636 Kristiansand Norway

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 and assembling location as mentioned above.

Nominal size, ID			Maximum working pressure (bar)	Ferrule designation	Minimum bend radius (mm)
SAE	inch	DN			
-04	1/4"	6	350	C18SXXXXXX-04XXX	60
-12	3/4"	19	350	C18SXXXXXX-12XXX	120
-24	1 1/2"	38	350	C18SXXXXXX-24XXX	255

Materials and material protection chosen for the specific system shall be suitable for the intended medium and environmental conditions.

The hose assemblies covered by this certificate shall not be installed in systems subject to pressure below atmospheric or vacuum conditions.

End connections shall fulfil the restrictions in DNV-RU-SHIP Pt.4 Ch.6 Sec.9 [5] as below:

- Threaded joints having pipe threads where pressure-tight joints are made on the threads:
 - 1) with parallel or tapered threads, shall comply with requirements of a recognized national or international standard.
 - 2) Shall not be used for piping systems conveying toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur.
- Mechanical joints other than standard bolted flanges are not covered by this certificate and shall be type approved separately in accordance with DNV-CP-0185.

Production testing

All hose assemblies delivered under the DNV 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

On the hoses: Dimensional check test, Change in length test, Cold flexibility test, Oil Resistance test, Cover adhesion test, Ozone resistance test

On the hose assembly: Burst test, Fire test, Impulse test

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

Where a flexible hose assembly is made up of items from different manufacturers, the components are to be clearly identified and traceable to evidence of prototype testing.

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 in <https://approvalfinder.dnv.com>.