Certificate no.:
TAP00002YW

TYPE APPROVAL CERTIFICATE

This is to certify:

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

with type designation(s)
DAAF579210, DAAF602374, DAAF629698, DAAF558921 / DAAF615604

issued to
DUNLOP HIFLEX OY
Vantaa, **Finland**

is found to comply with
DNV class programme DNV-CP-0183 – Type approval – Flexible non-metallic hoses
DNV rules for classification – Ships Pt.6 Ch.2 Sec.6 Low flashpoint liquid fuelled engines – LFL fuelled
DNV rules for classification – Ships Pt.4 Ch.6 Piping systems

Application:

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

Type:	Temperature range:	Max. working press.:	Sizes:
DAAF579210	-20°C to +80°C	64 bar	DN 5
DAAF602374	-20°C to +80°C	850 bar	DN 20
DAAF629698	-20°C to +80°C	Inner: 860 bar, Outer: 210 bar	Inner: DN13, Outer: DN38
DAAF558921 / DAAF615604	-20°C to +80°C	Inner: 690 bar, Outer: 210 bar	Inner: DN13, Outer: DN38

Issued at **Høvik** on **2025-10-28**
This Certificate is valid until **2030-10-27**.
DNV local unit: **Finland CMC**

for **DNV**

Approval Engineer: **Tobias Berntsen**

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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 USD 300 000.

Product description

4 types of non-metallic hoses with permanently fitted couplings intended for methanol applications with the following design:

1. **DAAF579210** constructed according to EN-ISO 13628-5:
   - Inner tube : Polyvinylidenefluoride (PVDF)
   - Reinforcement : 4 layers of high tensile steel wire
   - Cover : Polyamide
   - End fittings : Series Z (Spir Star)
   - Fire sleeve : Aerostyle Pyrojacket

2. **DAAF602374** constructed according to EN-ISO 13628-5:
   - Inner tube : Polyvinylidenefluoride (PVDF)
   - Reinforcement : 6 layers of high tensile steel wire
   - Cover : Polyamide
   - End fittings : Series Z (Spir Star)
   - Fire sleeve : Aerostyle Pyrojacket

3. Double walled hose, **DAAF629698**:
   With inner hose **13/4HPPA** constructed according to EN-ISO 13628-5:
   - Inner tube : Polyvinylidenefluoride (PVDF)
   - Reinforcement : 4 layers of high tensile steel wire
   - Cover : Polyamide
   - End fittings : Series HB (Spir Star)

   With outer hose **ABT4K** constructed according to EN-ISO 18752 Type CS:
   - Inner tube : Petroleum and biodegradable hydraulic fluid resistant synthetic rubber
   - Reinforcement : 4 high tensile steel spirals
   - Cover : Abrasion, Ozone, and hydrocarbon resistant synthetic rubber
   - End fittings : Alfagomma
   - Fire sleeve : Aerostyle Pyrojacket

4. Double walled hose, **DAAF558921 / DAAF615604**:
   With inner hose **13/2WPPA** constructed according to EN-ISO 13628-5:
   - Inner tube : Polyvinylidenefluoride (PVDF)
   - Reinforcement : 2 layers of high tensile steel wire
   - Cover : Polyamide
   - End fittings : Series A (Spir Star)

   With outer hose **ABT6K** constructed according to EN-ISO 18752 Type CC:
   - Inner tube : Petroleum and biodegradable hydraulic fluid resistant synthetic rubber
   - Reinforcement : 6 high tensile steel spirals
   - Cover : Abrasion, Ozone, and hydrocarbon resistant synthetic rubber, Minetuff
   - End fittings : Alfagomma
   - Fire sleeve : Aerostyle Pyrojacket

Fittings materials:
Fittings in contact with methanol: Stainless Steel: AISI 316
Outer hose fittings: Carbon steel.

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.

This certificate is issued on a provisional basis with the Volumetric Expansion test (ISO 13628-5:2009 Clause 7.3.7.10 for methanol service) still to be completed for hoses DAAF629698, DAAF602374, and DAAF579210. The hose assemblies may be used under this provisional approval, but use is prohibited without completion of component and system pressure testing.

Design data:

Type Designation		Size		Maximum Working Pressure (bar)
		DN	INCH	
DAAF579210		5	3/16”	64
DAAF602374		20	3/4”	850
DAAF558921 / DAAF615604	13/2WPPA - Inner hose	13	1/2”	690
	ABT6K- Cover hose	38	1 1/2”	210
DAAF629698	13/4HPPA - Inner hose	13	1/2”	860
	ABT4K - Cover hose	38	1 1/2”	210

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.

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

Impulse, dimensional, fire resistance, chemical resistance, cold flexibility, external collapse, volumetric expansion, burst, change in length, tensile 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.

Manufactured by:

Hose manufacturing location:	Hose type:
Spir Star AG, Auf der Rut 7, Rimbach-Mitlechtern, Germany	5/4HPPA, 20/6HPPA, 13/2WPPA, 13/4HPPA
Alfagomma Hydraulic S.p.A., Via Enrico Mattei no.6, 64020 - Castelnuovo Vomano (TE)	ABT6K, ABT4K

Coupling manufacturing locations:

Spir Star AG, Auf der Rut 7, Rimbach-Mitlechtern, Germany
Alfagomma Hydraulic S.p.A, Area Industriale Piano Lago, 87050 Mangone (CS) – Italy

Hose assembling location:

Dunlop Hiflex Oy, Jasperintie 320, 33960 Pirkkala, Finland
Dunlop Hiflex Oy, Orikedonkatu 8, 20380 Turku, Finland