DNV·GL

Certificate No:
TAP000000R

TYPE APPROVAL CERTIFICATE

This is to certify:

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

with type designation(s)
1SN HF (ALFAGOMMA type designation) / 122 Greenline Plus (DUNLOP HIFLEX type designation), FLEXOR 4SH MSHA (ALFAGOMMA type designation) / POWERTRAK 790 (DUNLOP HIFLEX type designation), AT6K/R15 (ALFAGOMMA type designation) / POWERTRAK 420 (DUNLOP HIFLEX type designation)

Issued to
ALFAGOMMA HYDRAULIC SPA
CASTELNUOVO VOMANO TE, Italy

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

Application :

See certificate.

Type:	Temperature range:	Max. working press.:	Sizes:
1SN HF (ALFAGOMMA type designation) / 122 Greenline Plus (DUNLOP HIFLEX type designation)	**See certificate**	**See certificate**	**-6 to -25**
FLEXOR 4SH MSHA (ALFAGOMMA type designation) / POWERTRAK 790 (DUNLOP HIFLEX type designation)	**see certificate**	**see certificate**	**-20 to -51**
AT6K/R15 (ALFAGOMMA type designation) / POWERTRAK 420 (DUNLOP HIFLEX type designation)	**-40°C to 121°C**	**420 bar**	**-20 and -38**

This Certificate is valid until **2019-06-30**.

Issued at **Høvik** on **2015-07-29**

for **DNV GL**

DNV GL local station: **Milan**

Approval Engineer: **Adel Samiei**

On behalf of 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.

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Product description

- Three types of hose assemblies:

  - 1SN HF (ALFAGOMMA type designation)
    122 Greenline Plus (DUNLOP HIFLEX type designation)
    Designed according to EN853 1SN
    Inner Tube: Oil Resistant Synthetic Rubber
    Reinforcement: One High Tensile Steel Braid (1B)
    Cover: Abrasion, Ozone and Hydrocarbon Resistant Synthetic Rubber
    Fitting: PH INOX P5

  - FLEXOR 4SH (MSHA) (ALFAGOMMA type designation)
    POWERTRAK 790 (DUNLOP HIFLEX type designation)
    Designed according To EN856 4SH
    Inner Tube: Oil Resistant Synthetic Rubber
    Reinforcement: Four High Tensile Steel Spirals (4S)
    Cover: Abrasion, Ozone and Hydrocarbon Resistant Synthetic Rubber
    Fitting: PH INOX P4

  - AT6K/R15 (ALFAGOMMA type designation)
    POWERTRAK 420 (DUNLOP HIFLEX type designation)
    Designed according To SAE 100R15
    Inner Tube: Oil Resistant Synthetic Rubber
    Reinforcement: Four/Six High Tensile Steel Spirals (4S/6S)
    Cover: Abrasion, Ozone and Hydrocarbon Resistant Synthetic Rubber
    Fitting: PH INOX P7

- Hoses made by: ALFAGOMMA Hydraulic SPA

- Fittings made by: PH INOXPH Industrie-Hydraulik GmbH & Co. KG Stefansbecke 35-37D-45549 Sprockhövel

Application/Limitation

- Hose assemblies types 1SN HF (ALFAGOMMA type designation) /122 Greenline Plus (DUNLOP HIFLEX type designation) & FLEXOR 4SH (MSHA) (ALFAGOMMA type designation) / POWERTRAK 790 (DUNLOP HIFLEX type designation) are suitable for use in:
  - hydraulic fluids in accordance with ISO 6743-4 with the exception of HFD R, HFD S and HFD T at temperatures ranging from -40 °C + 100 °C;
  - water based fluids at temperatures ranging from -40 °C to +70 °C;
  - Water at temperatures ranging from 0 °C to +70 °C.

- Hose assemblies' type AT6K/R15(ALFAGOMMA type designation) POWERTRAK 420 (DUNLOP HIFLEX type designation) is approved for use with petroleum base hydraulic fluids within a temperature range of -40°C to +121°C.

- Maximum working pressure (bar) of each hose assembly of types 1SN HF (ALFAGOMMA type designation) /122 Greenline Plus (DUNLOP HIFLEX type designation) & FLEXOR 4SH (MSHA) (ALFAGOMMA type designation) / POWERTRAK 790 (DUNLOP HIFLEX shall be according to following table:

-no	Hose I.D. (mm)		1SN HF	FLEXOR 4SH (MSHA)
	min	max		
-6	6,2	7,0	225	-
-8	7,7	8,5	215	-
-10	9,3	10,1	180	-

-12	12,3	13,5	160	-
-16	15,5	16,7	130	-
-19	18,6	19,8	105	420
-25	25,0	26,4	88	380
-31	31,4	33,0	-	325
-38	37,7	39,3	-	290
-51	50,4	52,0	-	250

- Maximum working pressure (bar) of hose assemblies type AT6K/R15(ALFAGOMMA type designation) / POWERTRAK 420 (DUNLOP HIFLEX type designation) shall be according to following table:

-no	Equivalent size in SAE 100R15	Hose I.D. (mm)		AT6K
		min	max	
-20	-12	18,6	19,8	420
-38	-24	37,7	39,3	420

- 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.

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

- The hose assemblies covered by this type approval may be assembled and delivered by other than the certificate holder under the following conditions:
  - The assembler is authorised by a written authorization from a certificate holder. The certificate holder shall keep record of all assembler authorisations.
  - Hose assemblies are in accordance with an assembly procedure issued by the certificate holder and the assembler has proved their qualifications by burst testing of a selection of hose/coupling combinations.
  - One sample of each hose type is to be burst tested and the testing is to be witnessed by DNV.

- Hose assemblies delivered from an authorized assembler shall in addition to the pressure test report with reference to the type approval certificate be delivered with a copy of the written authorization stamped by DNVGL.

- 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 the type approval certificate.

- The hose assemblies must only be fitted in places where they are always accessible.

- The hose assemblies are to be mounted in accordance with the manufacturer's instructions.

- The hoses shall not be installed in systems subject to pressure below atmospheric or pressure pulsation.

Type Approval documentation

Tests carried out

- Tests on hoses: dimensional check, cold flexibility, oil resistance, ozone, cover adhesion & change in length tests
- Tests on hose assemblies: Burst test, Fire test

Marking of product

For traceability to this Type Approval, the products are at least to be marked with:

- Manufacturer's name or trade mark
- Type designation (ALFAGOMMA or DUNLOP HIFLEX)
- Maximum working pressure
- Size
- Additional marking at manufacturer’s option

Periodical assessment

For retention of the Type Approval, DNV GL Surveyor shall perform a periodical assessment 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
- Burst test

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

END OF CERTIFICATE