

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Bulk Loading Hoses with Permanently Fitted Couplings**

with type designation(s)

T-442 LI, T-442 OI, T-448 LI, T-742 AA, T-748 AA

Issued to

**ALFAGOMMA INDUSTRIAL S.p.A.
S.Atto TE, Italy**

is found to comply with

**Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"
Det Norske Veritas' Standards for Certification 2.9 No. 5-791.70****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

Type:	Temperature range:	Max. working press.:	Sizes:
T-442 LI	-30°C to 80°C	10 bar	3" - 4"
T-442 OI	-40°C to 80°C	10 bar	3" - 4"
T-448 LI	-30°C to 80°C	20 bar	4"
T-742 AA	-30°C to 80°C	10 bar	4" - 5"
T-748 AA	-30°C to 80°C	20 bar	4" - 5"

This Certificate is valid until **2018-06-30**.Issued at **Høvik** on **2015-11-17**for **DNV GL**DNV GL local station: **Milan Verification**Approval Engineer: **Adel Samiei**

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.

Product description

- Nine type of hose assemblies for bulk loading purpose. All hoses are reinforced with high tensile textile cords.

Hose type	Dunlop Hiflex Type designation	Tube	Cover
T-442 LI	GACORD 31 RIG SUPPLY	NR	NBR/PVC Blend – Abrasion, ozone and hydrocarbon resistant
T-442 OI	Not applicable	Ultra High Molecular weight polyethylene	
T-448 LI	GACORD 33 RIG SUPPLY	NR	
T-742 AA	GACORD 86 RIG SUPPLY	Conductive NBR – Abrasion resistant	Conductive SBR/NR Blend – Abrasion and ozone resistant
T-748 AA	GACORD 88 RIG SUPPLY		

- End couplings: Carbon steel St. 52.0 (normalised) acc. DIN1629
Stainless Steel AISI 316 acc. ASTM A312
- Hose made by ALFAGOMMA SPA

Application/Limitation

- The hoses may be used for the following applications:

Softwall	Pressure	Size	Temp	Application
442LI	10 bar	3"-4"	-30 to 80°C	Potable Water
442OI	10 bar	3"-4"	-40 to 80°C	
448LI	20 bar	4"	-30 to 80°C	
742AA	10 bar	4"-5"	-30 to 80°C	Baryte and Dry Cement
748AA	20 bar	4"-5"		Bulk Material and Pneumatic Dry bulk Transfer

- All hoses 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
- These hose assemblies shall not be considered fire safe.
- These hoses have not been "End load" tested and do not have rated load test.
- "Electrical resistance test" have not been performed on these hoses.
- 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.

Job Id: **262.1-016584-1**
Certificate No: **TAP000005N**

- 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.
- The hose assemblies shall not be installed in the system subject to pressure pulsation.

Type Approval documentation

- Technical data sheet for T-442LI, T-442OI, T-448LI, T-642AA, T-646AA, T-648AA, T-652AA, T-652AA(Z), T-742AA and T-748AA all dated 26/04/2010
- Alfagomma test report signed by manufacturer's quality manager(containing: dimensional check test, cover adhesion test, ozone resistance test): TI OS03 (T-442 LI), TI OS04 (T-442 OI) , TI OS05 (T-448 LI) dated 2001-07-10
- Alfagomma test report signed by manufacturer's quality manager(containing: dimensional check test, cover adhesion test, ozone resistance test, oil resistance test, electrical resistance test): TI OS08 (T-642 AA), TI OS09 (T-646 AA), TI OS10 (T-648 AA), TI OS11 (T-652 AA(Z)), TI OS12 (T-652 AA), TI OS14, TI OS15, dated 2001-07-10
- Alfagomma test report signed by manufacturer's quality manager(containing: dimensional check test, cover adhesion test, ozone resistance test, electrical resistance test): TI OS14 (T-742 AA), TI OS15 (T-748 AA), dated 2001-07-10

Tests carried out

Dimensional check, adhesion, ozone resistance, resistance to liquid, hydrostatic test, proof pressure test, vacuum test, burst pressure

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
- Maximum working pressure
- Size

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. Also type testing according to a recognized standard (e.g. EN1765), end load tests and electrical resistance tests are to be performed on each type (selection of sizes shall be in accordance to the latest DNV GL rules) and the test reports to be submitted.