

# TYPE APPROVAL CERTIFICATE

**This is to certify:**

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

with type designation(s)

**Flexopak2 & Flexopak2 Supertuff/Super Slimline 241T and Super Slimline 241X TUFLEX, Flexopak2SC HF/ Slimline Plus 221T,221G / ARGUS 2SC, Flexopak 1SC/Slimline Plus 121T/ ARGUS 1SC**

Issued to

**Alfagomma Hydraulic S.p.A.**  
**Castellalto TE, Italy**

is found to comply with

**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**  
**DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018**  
**DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses**

**Application :**

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

Type:	Temperature range:	Max. working press.:	Sizes:
<b>Flexopak2 &amp; Flexopak2 Supertuff/Super Slimline 241T and Super Slimline 241X TUFLEX</b>	<b>-40°C to +100°C</b>	<b>70 to 420 bar</b>	<b>DN6 to DN76</b>
<b>Flexopak2SC HF/ Slimline Plus 221T,221G / ARGUS 2SC</b>	<b>-40°C to +100°C</b>	<b>165 to 400 bar</b>	<b>DN6 to DN25</b>
<b>Flexopak 1SC/Slimline Plus 121T/ ARGUS 1SC</b>	<b>-40°C to +100°C</b>	<b>88 to 225 bar</b>	<b>DN6 to DN25</b>

Issued at **Høvik** on **2018-10-11**

for **DNV GL**

This Certificate is valid until **2023-03-31**.

DNV GL local station: **Milan**

Approval Engineer: **Adel Samiei**

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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.



Job Id: **262.1-016581-9**  
 Certificate No: **TAP00000YK**  
 Revision No: **1**

### Product description

Type designations	Type 1	Type 2	Type 3
	Non-Skive	Skive	Non-Skive
Alfagomma (AG)	Flexopak 1 SC	Flexopak 2 / Flexopak 2 Supertuff	Flexopak 2SC HF
Dunlop Hiflex (DH)	Slimline Plus 121T	Super Slimline 241T, 241G	Slimline Plus 221T, 221G
ARGUS	ARGUS 1SC	-	ARGUS 2SC
Construction standard	EN857 - 1SC	EN857 - 2SC SAE J517 100R16	
Design: Flexible rubber hoses reinforced by:	one steel wire braid.	two steel wire braids.	
Tube:	Oil resistant synthetic rubber compound		
Cover:	Synthetic rubber compound, weather-, oil- and abrasion resistant		

### Coupling designations for each type/size:

Hose size		Flexopak 1SC - Slimline Plus 121T			Flexopak 2SC HF / Slimline Plus 221T, 221G	
		No skive fittings			Skive fittings	No skive fittings
Dash	DN	AG Branding		DH Branding	AG Branding	
-04	6	H1200103-04 H1200101-04	H1200AD1-04	-	H1100204-04	H1200102-04
-05	8	H1200103-05	H1200AD1-05	D110000-05	H1100204-05	H1200202-05
-06	10	H1200103-06	H1200AD1-06	D110000-06	H1100204-06	H1200202-06 H1200212-06
-08	12	H1200103-08	H1200AD1-08	D110000-08	H1100204-08	H1200202-08 H1200212-08
-10	16	H1200202-10	H1200AD1-10	D110000-10	H1100204-10	H1200202-10
-12	19	H1200202-12	H1200AD1-12	D110000-12	H1100204-12	H1200202-12
-16	25	H1200103-16	H1200AD1-16	D110000-16	H1100204-16	H1200202-16
-20	31	-	-	-	H1100104-20	-

Hose size		Flexopak 2 - Super Slimline 241T, 241G				
		SKIVE		NO SKIVE	NO SKIVE	SKIVE
Dash	DN	AG Branding	DH	DH Branding	AG Branding	AG Branding
- 04	6	H1100204-04	D330000-04	D110000-04	H1200AD1-04	H1100SK1-04
- 05	8	H1100204-05	D330000-05	D110000-05	H1200AD1-05	H1100SK1-05
- 06	10	H1100204-06	D330000-06	D110000-06	H1200AD1-06	H1100SK1-06
- 08	12	H1100204-08	D330000-08	D110000-08	H1200AD1-08	H1100SK1-08
- 10	16	H1100204-10	D330000-10	D110000-10	H1200AD1-10	H1100SK1-10
- 12	19	H1100204-12	D330000-12	D110000-12	H1200AD1-12	H1100SK1-12
- 16	25	H1100204-16	D330000-16	D110000-16	H1200AD1-16	H1100SK1-16
- 20	31	H1100104-20	-	-	H1200AD1-20	H1100404-20
-24	38	-	-	-	H1200AD1-24	-
-32	51	-	-	-	H1200AD1-32	-
-40	63	-	-	-	H1200TX2-40	-
-48	76	-	-	-	C122XXXXX-48	-

Couplings: Carbon Steel 11SMnPb30 according UNI EN 10277 / Stainless Steel AISI 304 - AISI 316

### Manufacturing plants:

Couplings: Alfagomma Hydraulic S.p.A., Area Industriale Piano Lago, 87050 Mangone (CS) - Italy  
 Hoses: Alfagomma Hydraulic S.p.A., Via Enrico Mattei no.6, 64020 - Castelnuovo Vomano (TE)  
 Alfagomma Hydraulic S.p.A., Area Industriale Piano Lago, 87050 Figline Vegliaturo (CS)

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## 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 or below assembling locations:

- 1- Alfagomma Hydraulic S.P.A., Mangone, Italy
- 2- Dunlop Hiflex Oy, Pirkkala, Finland
- 3- Dunlop Hiflex OY, Vantaa, Finland
- 4- Alfagomma Hydraulic France, Vendin, France
- 5- Dunlop Hiflex AB, Halmstad, Sweden
- 6- Dunlop Hiflex OY, Turku, Finland
- 7- Alfagomma hydraulic S.P.A, Bellusco, Italy excluding 2SC
- 8- Alfagomma Germany GmbH, Herne, Germany
- 9- Alfagomma Germany GmbH, Hamburg, Germany
- 10- Dunlop Hiflex AS, Stavanger, Norway
- 11- Dunlop Hiflex AS, Bergen, Norway
- 12- Dunlop Hiflex AS, Kristiansand, Norway
- 13- Dunlop Hiflex AS, Esbjerg, Denmark
- 14- Dunlop Hiflex AS, Kolding, Denmark
- 15- Alfagomma UK Ltd, Hydock, UK

Hose assemblies covered by this certificate may be used in petroleum based (-40°C to +100°C) and water based Hydraulic fluids (-40°C to +70°C) fluids.

Size			Maximum working pressure (bar)		
inch	DN	DASH	Flexopak2 / Super Slimline 241T	Flexopak 2SC HF / Slimline Plus 221T,221G	Flexopak 1SC / Slimline Plus 121T
¼	6	- 04	420	400	225
5/16	8	- 05	375	350	215
3/8	10	- 06	350	330	210
½	12	- 08	310	275	160
5/8	16	- 10	280	250	130
¾	19	- 12	240	215	105
1	25	- 16	210	165	88
1 ¼	31	- 20	140	-	-
1 ½	38	-24	125	-	-
2	51	-32	100	-	-
2	63	-40	75	-	-
3"	76	-48	70	-	-

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.

All hose assemblies delivered under the DNV GL 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. Flexible hoses of these types are not to be used on boiler fronts.

Hose assemblies covered by this certificate shall not be used in system subject to pressure below atmospheric or vacuum condition.

## Type Approval documentation

Alfagomma hose catalogue – 2018 revision

Test reports on Rubber Compounds: Cold flex.test, Ozone resistance test, and Oil resistance test

Quality control manual dated 2017-05-08 Specifications: Dunlop Hiflex Super Slimline

Job Id: **262.1-016581-9**  
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Qualification test results dated July 2004

Test reports dated 03.07.2000

"Hose / fitting combinations", "Fitting drawings list", and "Crimping table"

"ALFAGOMMA S.P.A. HYDRAULIC HOSE DIVISION HYDRAULIC PRODUCT TRAINING MANUAL" issue 1 dated May 2017

Insert Dimensions For Braid Hose

Test reports: 01-06/2008, 84-89/2009 and 103/2009, Impulse test reports: 66/03, 65/03, 66/06, 59/07A,63/03,64/03,59/07

Impulse test reports dated 2007-02-21, 2006-04-03, 2008-11-20

Alfagomma test reports dated 2009-10-23, 2010-06-16, 2009-10-16, 2010-05-15

LAPI fire test reports: 157.0IS0110/05, 219.0IS0110/05, 220.0IS0110/05, dated 2005-01-27 &

444.0IS0110/08, 443.0IS0110/08, 442.0IS0110/08 & 525.0IS0110/04, 527.0IS0110/04 and

528.0IS0110/04 dated 2004-06-18 and 1416.0IS0110/09, 1417.0IS0110/09 & 1418.0IS0110/09 dated

2009-11-09 and 2741.0IS0110/17, 2742.0IS0110/17, 2743.0IS0110/17, 2744.0IS0110/17,

2745.0IS0110/17, 2746.0IS0110/17, 2747.0IS0110/17, 2748.0IS0110/17, 2749.0IS0110/17

Test report dated 2014-03-05 witnessed by DNV local station Milan (acc. to ISO 1402)

Survey report MIL-14-0455-6 dated 2014-03-06 signed and stamped by DNV local station Milan

Burst test report number 95-0263 & reports dated 2009-10-12, 2008-06-19, 2017-04-19 & 2017-07-21 witnessed by DNV surveyor

Renewal burst pressure test, change in length and leakage test report numbers: 07/2018, 08/2018,

09/2018, 10/2018, 11/2018, 12/2018, 13/2018, 14/2018, 15/2018, 16/2018, 17/2018, 18/2018,

76/2018, 69/2018, 77/2018, 36/2018, 39/2018, 40/2018, 119/2018, 120/2018, 126/2018, 96/2018,

98/2018, 104/2018, 47/2018, 49/2018, 44/2018, 62/2018, 68/2018, 61/2018, 108/2018, 109/2018,

115/2018, 56/2018, 58/2018, 83/2018, 85/2018, 84/2018, 136/2018, 140/2018, 139/2018, 131/2018,

132/2018, 128/2018, 150/2018, 145/2018, 144/2018, 180/2018, 182/2018, 183/2018, 165/2018,

164/2018, 168/2018, 171/2018, 175/2018, 176/2018

## Tests carried out

Dimensional Check Test, Change in Length Test, Burst Test, Cold Flexibility Test, Ozone Resistance Test, Impulse Test, Oil Resistance Test according to EN853 and SAE J517 respectively and Fire Test,

## Marking of product

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

- Hose manufacturer's name or trademark;
- Date of manufacture (month/year);
- Designation type reference;
- Nominal diameter;
- Pressure rating;
- Temperature rating.

## Periodical assessment

For retention of the Type Approval, a DNV GL 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 DNVGL-CP-0338.