

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.
Castelnuovo Vomano, 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:
Flexopak2 & Flexopak2 Supertuff/Super Slimline 241T and Super Slimline 241X TUFLEX	-40°C to +100°C	70 to 420 bar	DN6 to DN76
Flexopak2SC HF/ Slimline Plus 221T,221G / ARGUS 2SC	-40°C to +100°C	165 to 400 bar	DN6 to DN25
Flexopak 1SC/Slimline Plus 121T/ ARGUS 1SC	-40°C to +100°C	88 to 225 bar	DN6 to DN25

Issued at **Høvik** on **2020-01-31**

for **DNV GL**

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

DNV GL local station: **Italy/Malta CMC**

Approval Engineer: **Adel Samiei**

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Zeinab Sharifi
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: **262.1-016581-13**
 Certificate No: **TAP00000YK**
 Revision No: **3**

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	
Dash	DN	AG Branding	DH Branding	AG Branding	DH Branding	AG Branding	DH Branding
- 04	6	H1100204-04	D330000-04	H1100SK1-04	H3100SK1-04	D110000-04	H1200AD1-04
- 05	8	H1100204-05	D330000-05	H1100SK1-05	H3100SK1-05	D110000-05	H1200AD1-05
- 06	10	H1100204-06	D330000-06	H1100SK1-06	H3100SK1-06	D110000-06	H1200AD1-06
- 08	12	H1100204-08	D330000-08	H1100SK1-08	H3100SK1-08	D110000-08	H1200AD1-08
- 10	16	H1100204-10	D330000-10	H1100SK1-10	H3100SK1-10	D110000-10	H1200AD1-10
- 12	19	H1100204-12	D330000-12	H1100SK1-12	H3100SK1-12	D110000-12	H1200AD1-12
- 16	25	H1100204-16	D330000-16	H1100SK1-16	H3100SK1-16	D110000-16	H1200AD1-16
- 20	31	H1100104-20	-	H1100404-20	-	-	H1200AD1-20
-24	38	-	-	-	-	-	H1200AD1-24
-32	51	-	-	-	-	-	H1200AD1-32
-40	63	-	-	-	-	-	H1200TX2-40
-48	76	-	-	-	-	-	C122XXXX-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
- 16- Alfagomma Korea Co, Ltd., Hwaseong-Si, Gyeonggi-do, Korea only FLEXOPAK 2SC HF & FLEXOPAK 2

Hose assemblies covered by this certificate may be used in: Petroleum based (-40°C to +100°C), water based Hydraulic fluids (-40°C to +70°C) fluids, water and air (0°C to +70°C)

Size			Maximum working pressure (bar)		
inch	DN	DASH	Flexopak 2 / 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.

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.

The cover of hoses for gaseous applications shall be pin-pricked.

Production testing

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 this type approval certificate.

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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

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

Burst pressure test report 059,060/2019 dated 2019-06-19 witnessed by DNV GL

Impulse test report numbers: 051/19-, 087/17-A, 017/18-

Fire test report numbers: 2318.0IS0110/18, 1741.0IS0100/19, 2317.0IS0110/18

Change in length, leakage and burst pressure test reports (stamped as witnessed by DNV GL) 05/2017, 06/2017 & 07/2017

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.