



## ***Confirmation of Product Type Approval***

Please refer to the "Service Restrictions" shown below to determine if Unit Certification is required for this product. This certificate reflects the information on the product in the ABS Records as of the date and time the certificate is printed.

Pursuant to the Rules of the American Bureau of Shipping (ABS), the manufacturer of the below listed product held a valid Manufacturing Assessment (MA) with expiration date of 27-FEB-2024. The continued validity of the Manufacturing Assessment is dependent on completion of satisfactory audits as required by the ABS Rules.

And; a Product Design Assessment (PDA) valid until subject to continued compliance with the Rules or standards used in the evaluation of the product.

The above entitle the product to be called Product Type Approved.

The Product Design Assessment is valid for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

### **Product Name: Non-Metallic Flexible Hose**

**Model Name(s): ALFAGOMMA ALFABIOTECH 3000/ALFABIOTECH 3000  
SUPERTUFF - DUNLOP HIFLEX POWERFLEXBIO 3000/POWERFLEX 3000  
TUFLEX ALFAGOMMA ALFABIOTECH 4000/ALFABIOTECH 4000 SUPERTUFF  
- DUNLOP HIFLEX POWERFLEXBIO 4000/POWERFLEX 4000 TUFLEX  
ALFAGOMMA ALFABIOTECH 5000/ALFABIOTECH 5000 SUPERTUFF -  
DUNLOP HIFLEX POWERFLEXBIO 5000/POWERFLEX 5000 TUFLEX  
ALFAGOMMA ALFABIOTECH 5000 PLUS/ALFABIOTECH 5000 PLUS  
SUPERTUFF - DUNLOP HIFLEX POWERFLEXBIO 5000 PLUS/ POWERFLEX  
5000 PLUS TUFLEX ALFAGOMMA ALFABIOTECH 6000/ALFABIOTECH 6000  
SUPERTUFF - DUNLOP HIFLEX POWERFLEXBIO 6000/POWERFLEX 6000  
TUFLEX**

**Presented to:**

ALFAGOMMA HYDRAULIC S.P.A.  
VIA E. MATTEI 6  
I-64020  
Italy

**Intended Service:**

Hydraulic fluids

**Description:**

ALFABIOTECH 3000 - POWERFLEXBIO 3000: oil resistant synthetic rubber hose reinforced with four high tensile steel spirals (six for DN76), covered with ozone and abrasion resistant synthetic rubber sheath ALFABIOTECH 4000 - POWERFLEXBIO 4000: oil resistant synthetic rubber hose reinforced with four high tensile steel spirals, covered with ozone and abrasion resistant synthetic

rubber sheath. ALFABIOTECH 5000 - POWERFLEXBIO 5000: oil resistant synthetic rubber hose reinforced with four high tensile steel spirals (up to DN32), six spirals (over DN32), covered with ozone and abrasion resistant synthetic rubber sheath. ALFABIOTECH 5000 PLUS - POWERFLEXBIO 5000 PLUS: oil resistant synthetic rubber hose reinforced with four high tensile steel spirals, covered with ozone and abrasion resistant synthetic rubber sheath. ALFABIOTECH 6000 - POWERFLEXBIO 6000: oil resistant synthetic rubber hose reinforced with four high tensile steel spirals (up to DN32), six spirals (over DN32), covered with ozone and abrasion resistant synthetic rubber sheath

**Tier:**

3

**Ratings:**

ALFABIOTECH 3000 - POWERFLEXBIO 3000: from DN32 to DN76, working pressure 210 bar, temperature range -40°C to +121°C. ALFABIOTECH 4000 - POWERFLEXBIO 4000: from DN20 to DN 51, working pressure 280 bar and DN38 working pressure 290 bar, temperature range -40°C to +121°C. ALFABIOTECH 5000 - POWERFLEXBIO 5000: from DN16 to DN 51, working pressure 350 bar, temperature range -40°C to +121°C. ALFABIOTECH 5000 PLUS - POWERFLEXBIO 5000 PLUS: DN20 and DN25 working pressure 380 bar, temperature range -40°C to +121°C. ALFABIOTECH 6000 - POWERFLEXBIO 6000: DN6 working pressure 450 bar, DN10 working pressure 445 bar, from DN12 to DN 51, working pressure 420 bar, temperature range -40°C to +121°C. For additional details see attachment

**Service Restrictions:**

1) Unit Certification is not required for this product. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined. 2) Hoses are to be completed with factory assembled end fittings or factory supplied end fittings installed in accordance with manufacturer's specifications. 3) End connections are to comply with applicable requirements and limitation of Marine Vessels Rules (4-6-2/5.5.4, 4-6-2/5.5.5, 4-6-7/3.5.1, 4-6-7/5.3.2). 4) Hose assemblies are to be installed only where flexibility is required, in clearly visible and readily accessible locations, and are not to be subject to torsional deflection under normal conditions; hose length is to be limited to that required by flexibility only. 5) Not to be used in high pressure fuel oil injection systems, steam systems or oil supply lines to boilers. 6) Not to be used for installations where repeated and/or frequent flexing is expected. 7) Flexible Hoses are to be permanently marked by the manufacturer with the following details: Hose manufacturer's name or trademark, date of manufacturer (month/year), designation type reference, nominal diameter, pressure and temperature rating in accordance with Marine Vessel Rules 4-6-2/5.7.6.

**Comments:**

- Only ALFAGOMMA's approved ferrules and inserts are to be used for end fittings, as per the manufacturer's recommendations. - The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product. - The hereby certificate is valid for Alfacomma Alfabiotech 3000/4000/5000/5000plus/6000 families Minetuff and Supertuff branding and for Dunlop Hiflex Powerflexbio 3000/4000/5000/5000plus/6000 families Hi-Tuff and Tuflex branding

**Notes / Documentation:**

Drawing No. CATALOGO ABT, CATALOGO ABT, Revision: 0, Pages: 1 Drawing No. CATALOGO RACCORDI, Catalogo raccordi NO SKIVE NS4-NS6, Revision: 0, Pages: 1 Drawing No. FireTest at LAPI dated 15 Nov 2018 ABT6K\_ABT4Kdn25 INOX, FireTest ABT6K\_ABT4Kdn25 INOX, Revision: 0, Pages: 1 Drawing No. FireTestABT at LAPI dated 12 Dec 2016, FireTestABTfamilies, Revision: 0, Pages: 1 Drawing No. FireTestABT\_no skive NS4-NS6 at LAPI dated 06 Jun 2018, Fire Test ABT\_no skive NS4-NS6, Revision: 1, Pages: 0 Drawing No. FittingInox, FittingInox AISI 316, Revision: 0, Pages: 1 Drawing No. Fittingnoskive , Fitting NO SKIVE NS4-NS6, Revision: 0, Pages: 1 Drawing No. HoseFittingCombination, HoseFittingCombination, Revision: 0, Pages: 1 Drawing No. Impulse test reports at ALFAGOMMA dated 27 Jul 2017, 25 May 2017, 11 Apr 2018, 04 Aug 2017, 12 Jun 2018, 13 Sep 2017, 21 Sep 2017, 02 May 2017, 28 Feb 2018, 17 Apr 2018, 08 Jan 2018, 31 Jul 2017, Revision: 0, Pages: 1 Drawing No. Inspection certificate at ALFAGOMMA dated 19 Nov 2018, Revision: 0, Pages: 1 Burst Test at ALFAGOMMA ABT5K DN51 dated 09/06/2016, Inspection Certificate 3.2 ABT5K dn51Surveyour, Revision: 0, Pages: 1 Drawing No. Data Sheet ABT4000, Data Sheet Alfabiotech 4000, Revision: 0, Pages: 1 Drawing No. Data Sheet ABT5000-5000PLUS , Data Sheet Alfabiotech 5000-5000Plus , Revision: 0,

Pages: 1 Drawing No. Data Sheet ABT6000, Data Sheet Alfabiotech 6000, Revision: 0, Pages: 1 Drawing No. Drawings Fitting ABT4K, Drawings Fitting ABT4K, Revision: 0, Pages: 1 Drawing No. Drawings Fitting ABT5K-5KP, Drawings Fitting ABT5K-5KP, Revision: 0, Pages: 1 Drawing No. Drawings Fitting ABT6K, Drawings Fitting ABT6K, Revision: 0, Pages: 1 Drawing No. Fire Test dated at LAPI 12/02/2014, Fire Test ISO 15540 ABT, Revision: 0, Pages: 1 Drawing No. Fire Test at LAPI ISO 15540 ABT dated 12/02/2014, Complete Fire Test Report , Revision: 0, Pages: 1 Drawing No. Hose Fitting combination, Table hose fitting combination, Revision: 0, Pages: 1 Drawing No. Impulse Test ABT5K at ALFAGOMMA dn51 dated 28/07/2015, Impulse Test Report ABT5K DN51, Revision: 0, Pages: 1 Drawing No. Impulse Test Report at ALFAGOMMA dated 08/11/2013, Impulse Test Report ABT, Revision: 0, Pages: 1 Drawing No. Inspection Certificate at ALFAGOMMA dated 03/04/2014, Inspection Certificate ABT 3.2, Revision: 0, Pages: 1 Drawing No. Test Report at ALFAGOMMA dated 22/07/2014, Test Report ABT 2.2, Revision: 0, Pages: 1 Drawing No. 3000 Data Sheet, Revision: 0, Pages: 1

**Term of Validity:**

This Product Design Assessment (PDA) Certificate 19-GE1829455-PDA, dated 28/Feb/2019 remains valid until 27/Feb/2024 or until the Rules or specifications used in the assessment are revised (whichever occurs first). This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product. Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA. Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

**ABS Rules:**

2019 Rules for Conditions of Classification - Offshore Units and Structures 1-1-4/9.7, 1-1-A2, 1-1-A3, which covers the following: 2019 Mobile Offshore Drilling Units Rules: 4-2-1/11.29 2019 Mobile Offshore Units Rules: 4-2-1/11.29 2019 Rules for Conditions of Classification, 1-1-4/7.7, 1-1-A3, 1-1-A4, which covers the following: 2019 Steel Vessels Rules: 4-6-2/5.7 2019 Steel Vessels Rules Under 90 Meters: 4-4-1/9.19 2019 Offshore Supply Vessels Rules: 4-6-2/5.7 2019 Guide for Building and Classing Yachts: 4-1-1/3.3, 4-4-1/9.19 2019 Marine Vessels Rules: 4-6-2/5.7 2019 Rules for Conditions of Classification - High Speed Crafts 1-1-4/11.9, 1-1-A2, 1-1-A3, , which covers the following: 2019 High Speed Crafts Rules 4-4-1/9.19

- National Standards:**
- International Standards:**
- Government Authority:**
- EUMED:**
- Others:**

<b>Model Certificate</b>	<b>Model Certificate No</b>	<b>Issue Date</b>	<b>Expiry Date</b>
PDA	19-GE1829455-PDA	01-MAR-2019	27-FEB-2024



ABS Programs

ABS has used due diligence in the preparation of this certificate and it represents the information on the product in the ABS Records as of the date and time the certificate was printed. Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. Limited circumstances may allow only Prototype Testing to satisfy Type Approval. The approvals of Drawings and Products remain valid as long as the ABS Rule, to which they were assessed, remains valid. ABS cautions manufacturers to review and maintain compliance with all other specifications to which the product may have been assessed. Further, unless it is specifically indicated in the description of the product; Type Approval does not necessarily waive witnessed inspection or survey procedures (where otherwise required) for products to be used in a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS. Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.

ALFABIOTECH HOSE/FITTING COMBINATION																
Hose						Ferrule			Insert							
Branding Alfagomma/Dunlop Hiflex STANDARD Alfagomma SUPERTUFF/Dunlop Hiflex TUFLEX	Reference Specification	Type Designation	Hose size			TEMPER. RANGE	WORK. PRESS. [bar]	No skive		Skive		Double Skive	Skive/No Skive	Skive/No Skive	Double Skive	
			Inch	Dash	DN			Standard	Multispiral	Standard	Multispiral	Interlock	Standard	Multispiral	Interlock	
																AG Branding
Carbon Steel and Stainless Steel																
ALFAGOMMA ALFABIOTECH 3K DUNLOP HIFLEX POWERFLEXBIO 3K ALFAGOMMA ALFABIOTECH 3K SUPERTUFF DUNLOP HIFLEX POWERFLEXBIO 3K TUFLEX	ISO 18752 Exceeds SAE100 R12	ABT 3K	1.1/4	20	32	-40 °C/+80 °C	210	-	-	H1100404-20	-	-	H12xxxx-20xxx	-	-	
			1.1/2	24	38	-40 °C/+80 °C	210	-	-	H1100404-24	-	-	H12xxxx-24xxx	-	-	
			2	32	51	-40 °C/+80 °C	210	H1200204-32	-	-	-	-	H12xxxx-32xxx	-	-	
			3	48	76	-40 °C/+80 °C	210	-	-	-	-	H1T00600-48	-	-	H1Txxxx-48xxx	
ALFAGOMMA ALFABIOTECH 4K DUNLOP HIFLEX POWERFLEXBIO 4K ALFAGOMMA ALFABIOTECH 4K SUPERTUFF DUNLOP HIFLEX POWERFLEXBIO 4K TUFLEX	ISO 18752	ABT 4K	3/8	06	10	-40 °C/+80 °C	280	-	-	-	-	-	-	-	-	
			1/2	08	16	-40 °C/+80 °C	280	-	-	-	-	-	-	-	-	
			3/4	12	19	-40 °C/+80 °C	280	H1200204-12	-	-	-	-	-	H12xxxx-12xxx	-	-
			1	16	25	-40 °C/+80 °C	280	H1200204-16	-	H1100404-16 H3100404-16	-	-	-	H12xxxx-16xxx H32xxxx-16xxx H12xxxx-20xxx	-	-
			1.1/4	20	32	-40 °C/+80 °C	280	H1200204-20	-	-	-	-	-	-	-	
			1.1/2	24	38	-40 °C/+80 °C	290	-	H1300NS4-24	-	-	H1400200-24	-	H13xxxx-24	H14xxxx-24xxx	
ALFAGOMMA ALFABIOTECH 5K DUNLOP HIFLEX POWERFLEXBIO 5K ALFAGOMMA ALFABIOTECH 5K SUPERTUFF DUNLOP HIFLEX POWERFLEXBIO 5K TUFLEX	ISO 18752	ABT 5K	5/8	10	16	-40 °C/+80 °C	350	-	-	H1100404-10	-	-	H12xxxx-10xxx	-	-	
			3/4	12	19	-40 °C/+80 °C	350	-	H1300NS4-12	H1100404-12	H1400200-12	H12xxxx-12xxx	H13xxxx-12xxx	H14xxxx-12xxx		
			1	16	25	-40 °C/+80 °C	350	-	H1300NS4-16	H1100404-16	H1400200-16	H12xxxx-16xxx	H13xxxx-16xxx	H14xxxx-16xxx		
			1.1/4	20	32	-40 °C/+80 °C	350	-	H1300NS4-20	-	H1400200-20	-	H13xxxx-20xxx	H14xxxx-20xxx		
			1.1/2	24	38	-40 °C/+80 °C	350	-	H1300NS6-24	-	H1400301-24 H3400301-24	-	H13xxxx-24xxx	H14xxxx-24xxx H34xxxx-24xxx		
			2	32	51	-40 °C/+80 °C	350	-	H1300NS6-32	-	H1400301-32	-	H13xxxx-32xxx	H14xxxx-32xxx		
			2 1/2	40	63	-40 °C/+80 °C	350	-	-	-	H1T00600-40	-	-	H1Txxxx-40xxx		
	3	48	76	-40 °C/+80 °C	350	-	-	-	H1T00600-48 H3T00600-48	-	-	H1Txxxx-48xxx H3Txxxx-48xxx				
ALFAGOMMA ALFABIOTECH 5KPLUS DUNLOP HIFLEX POWERFLEXBIO 5K PLUS ALFAGOMMA ALFABIOTECH 5K PLUS SUPERTUFF DUNLOP HIFLEX POWERFLEXBIO 5K PLUS TUFLEX	ISO 18752	ABT 5K PLUS	3/4	12	19	-40 °C/+80 °C	380	-	H1300NS4-12	H1100404-12	H1400200-12	H12xxxx-12xxx	H13xxxx-12xxx	H14xxxx-12xxx		
			1	16	25	-40 °C/+80 °C	380	-	H1300NS4-16	-	H1400200-16	-	H13xxxx-16xxx	H14xxxx-16xxx		
ALFAGOMMA ALFABIOTECH 6000 DUNLOP HIFLEX POWERFLEXBIO 6000 ALFAGOMMA ALFABIOTECH 6K SUPERTUFF DUNLOP HIFLEX POWERFLEXBIO 6K TUFLEX	ISO 18752 Exceeds SAE 100 R15	ABT 6K	1/4	04	6	-40 °C/+80 °C	450	-	-	H1100404-04 H3200404-04	-	-	H12xxxx-04xxx H32xxxx-04xxx	-	-	
			3/8	06	10	-40 °C/+80 °C	445	-	-	H1100404-06 H3100404-06	-	-	H12xxxx-06xxx H32xxxx-06xxx	-	-	
			1/2	08	13	-40 °C/+80 °C	420	-	-	H1100404-08 H3100404-08	-	H1400200-08	H12xxxx-08xxx H32xxxx-08xxx	-	-	
			5/8	10	16	-40 °C/+80 °C	420	-	-	-	H1400301-10 H3400301-10	-	-	-		
			3/4	12	19	-40 °C/+80 °C	420	-	H1300NS4-12	-	H1400200-12 H3400200-12	-	H13xxxx-12xxx	H14xxxx-12xxx H34xxxx-12xxx		
			1	16	25	-40 °C/+80 °C	420	-	H1300NS4-16	-	H1400200-16 H3400200-16	-	H13xxxx-16xxx	H14xxxx-16xxx H34xxxx-16xxx		
			1.1/4	20	32	-40 °C/+80 °C	420	-	H1300NS6-20	-	H1400301-20 H3400301-20	-	H13xxxx-20xxx	H14xxxx-20xxx H34xxxx-20xxx		
			1.1/2	24	38	-40 °C/+80 °C	420	-	-	-	H1400301-24 H3400301-24	-	-	H14xxxx-24xxx H34xxxx-24xxx		
2	32	51	-40 °C/+80 °C	420	-	-	-	H1T00600-32 H3T00600-32	-	-	H1Txxxx-32xxx H3Txxxx-32xxx					