



**CERTIFICATE OF CONFORMITY**  
No. MAC356317CS

We certify that the following product is in compliance with the reference standard quoted below

<i>Description</i>	<b>Non metallic flexible hoses</b>
<i>Type</i>	<b>ALFABIOTECH 3000 (Supertuff)/Powerflexbio 3000(TUFLEX), ALFABIOTECH 4000 (Supertuff)/Powerflexbio 4000(TUFLEX), ALFABIOTECH 5000 (Supertuff)/Powerflexbio 5000(TUFLEX), ALFABIOTECH 5000 PLUS (Supertuff)/Powerflexbio 5000 PLUS (TUFLEX), ALFABIOTECH 6000 (Supertuff)/Powerflexbio 6000(TUFLEX)</b>
<i>Applicant</i>	<b>ALFAGOMMA HYDRAULIC SPA VIA ENRICO MATTEI 6 64020 CASTELNUOVO VOMANO (TE) ITALY</b>
<i>Manufacturer</i>	<b>ALFAGOMMA HYDRAULIC SPA</b>
<i>Place of manufacture</i>	<b>VIA ENRICO MATTEI 6 64020 CASTELNUOVO VOMANO (TE) ITALY</b>
<i>Reference standards</i>	<b>Part C, Chapter 1, Section 10 of RINA Rules</b>

Issued in **Genova** on **May 2, 2019**. This Certificate is valid until **May 1, 2024**

RINA Services S.p.A.  
**Fabio Morbioni**

This certificate consists of this page and 1 enclosure



**CERTIFICATE OF CONFORMITY**

No. **MAC356317CS**

Enclosure - Page 1 of 1

**ALFABIOTECH 3000 (Supertuff)/Powerflexbio 3000(TUFLEX), ALFABIOTECH 4000 (Supertuff)/Powerflexbio 4000(TUFLEX), ALFABIOTECH 5000 (Supertuff)/Powerflexbio 5000(TUFLEX), ALFABIOTECH 5000 PLUS (Supertuff)/Powerflexbio 5000 PLUS (TUFLEX), ALFABIOTECH 6000 (Supertuff)/Powerflexbio 6000(TUFLEX)**

Type:	Temperature range:	Max. working press.:	Sizes:
<b>Alfabiotech 3000 (Supertuff) / Powerflexbio 3000 (TUFLEX)</b>	-40°C to +121°C	210 bar	-20,-24,-32,-48
<b>Alfabiotech 4000 (Supertuff) / Powerflexbio 4000 (TUFLEX)</b>	-40°C to +121°C	280 to 290 bar	-12,-16,-20,-24,-32
<b>Alfabiotech 5000 (Supertuff) / Powerflexbio 5000 (TUFLEX)</b>	-40°C to +121°C	350 bar	-10,-12,-16,-20,-24,-32,-40,-48
<b>Alfabiotech 5000PLUS (Supertuff) / Powerflexbio 5000PLUS (TUFLEX)</b>	-40°C to +121°C	380 bar	-12,-16
<b>Alfabiotech 6000 (Supertuff) / Powerflexbio 6000 (TUFLEX)</b>	-40°C to +121°C	420 to 450 bar	-04,-06,-08,-10,-12,-16,-20,-24,-32

**Product description**

Five types of flexible rubber hoses with permanently attached couplings constructed according to ISO 18752 with type designations (except Alfabiotech 5000 DN76 which is not according to ISO18752).

ALFAGOMMA designations: ALFABIOTECH 3000, 4000, 5000/ 5000 PLUS, 6000 (SUPERTUFF)

DUNLOP HIFLEX designations: POWERFLEXBIO 3000, 4000, 5000/ 5000 PLUS, 6000 (TUFLEX)

**Design:**

- Tube: Oil resistant synthetic rubber and biodegradable hydraulic fluids
- Cover: Abrasion, ozone and hydrocarbon resistant synthetic rubber. MSHA.
- Reinforcement: Type 3000: Four/six high tensile steel spirals
- Type 4000: Four high tensile steel spirals
- Type 5000: Four/six high tensile steel spirals
- Type 5000PLUS: Four high tensile steel spirals
- Type 6000: Four/six high tensile steel spirals

ALFABIOTECH 3000	Size		Ferrule	Insert
	1 ¼"	-20	H1100404-20	H12xxxxx-20
	1 ½"	-24	H1100404-24	H12xxxxx-24
	2"	-32	H1200204-32	H12xxxxx-32
	3"	-48	H1T00600-48	H1Txxxxx-48

ALFABIOTECH 4000	Size		Ferrule	Insert	Ferrule	Insert
	¾"	-12	H1200204-12	H12xxxxx-12	-	-
	1"	-16	H1200204-16	H12xxxxx-16	H1100404-16 H3100404-16	H12xxxxx-16 H32xxxxx-16
	1 ¼"	-20	H1200204-20	H12xxxxx-20	-	-
	1 ½"	-24	H1300NS4-24	H13xxxxx-24	H1400200-24	H14xxxxx-24
	2"	-32	H1300NS4-32	H13xxxxx-32	H1400200-32	H14xxxxx-32

ALFABIOTECH 5000 Plus							
Size	Ferrule	Insert	Ferrule	Insert	Ferrule	Insert	
¾"	-12	H1300NS4-12	H13xxxxx-12	H1100404-12	H12xxxxx-12	H1400200-12	H14xxxxx-12
1"	-16	H1300NS4-16	H13xxxxx-16	-	-	H1400200-16	H14xxxxx-16



**CERTIFICATE OF CONFORMITY**

No. **MAC356317CS**

Enclosure - Page 2 of 4

**ALFABIOTECH 3000 (Supertuff)/Powerflexbio 3000(TUFLEX), ALFABIOTECH 4000 (Supertuff)/Powerflexbio 4000(TUFLEX), ALFABIOTECH 5000 (Supertuff)/Powerflexbio 5000(TUFLEX), ALFABIOTECH 5000 PLUS (Supertuff)/Powerflexbio 5000 PLUS (TUFLEX), ALFABIOTECH 6000 (Supertuff)/Powerflexbio 6000(TUFLEX)**

<b>ALFABIOTECH 6000</b>					
Size		Ferrule	Insert	Ferrule	Insert
1/4"	-04	H1100404-04 H3100404-04	H12xxxxx-04 H32xxxxx-04		
3/8"	-06	H1100404-06 H3100404-06	H12xxxxx-06 H32xxxxx-06		
1/2"	-08	H1100404-08 H3100404-08	H12xxxxx-08 H32xxxxx-08	H1400200-08	H14xxxxx-08
5/8"	-10	-	-	H1400200-10 H3400200-10	H14xxxxx-10 H34xxxxx-10
3/4"	-12	H1300NS4-12	H13xxxxx-12	H1400200-12 H3400200-12	H14xxxxx-12 H34xxxxx-12
1"	-16	H1300NS4-16	H13xxxxx-16	H1400200-16 H3400200-16	H14xxxxx-16 H34xxxxx-16
1 1/4"	-20	H1300NS6-20	H13xxxxx-20	H1400301-20 H3400301-20	H14xxxxx-20 H34xxxxx-20
1 1/2"	-24	-	-	H1400301-24 H3400301-24	H14xxxxx-24 H34xxxxx-24
2"	-32	-	-	H1T00600-32 H3T00600-32	H1Txxxxx-32 H3Txxxxx-32

<b>ALFABIOTECH 5000</b>							
Size		Ferrule	Insert	Ferrule	Insert	Ferrule	Insert
5/8"	-10	-	-	H1100404-10	H12xxxxx-10	-	-
3/4"	-12	H1300NS4-12	H13xxxxx-12	H1100404-12	H12xxxxx-12	H1400200-12	H14xxxxx-12
1"	-16	H1300NS4-16	H13xxxxx-16	H1100404-16	H12xxxxx-16	H1400200-16	H14xxxxx-16
1 1/4"	-20	H1300NS4-20	H13xxxxx-20	-	-	H1400200-20	H14xxxxx-20
1 1/2"	-24	H1300NS6-24	H13xxxxx-24	-	-	H1400301-24 H3400301-24	H14xxxxx-24 H34xxxxx-24
2"	-32	H1300NS6-32	H13xxxxx-32	-	-	H1400301-32	H14xxxxx-32
2 1/2"	-40	-	-	-	-	H1T00600-40	H1Txxxxx-40
3"	-48	-	-	-	-	H1T00600-48 H3T00600-48	H1Txxxxx-48 H3Txxxxx-48

**End fittings material:** Carbon Steel 11SMnPb30 according UNI EN 10277  
INOX Steel AISI 316

**Manufacturing plants:**

Hoses: Alfagomma Hydraulic S.p.A., Via Enrico Mattei no.6, 64020 - Castelnuovo Vomano (TE)

Couplings: Alfagomma Hydraulic S.p.A, Area Industriale Piano Lago, 87050 Mangone (CS) – Italy

**Application/Limitation:**

Hose assemblies covered by this certificate may be used in:

Petroleum based (-40°C to +121°C), water based Hydraulic fluids (-40°C to +70°C) fluids, water and air (0°C to +70°C)



## CERTIFICATE OF CONFORMITY

No. MAC356317CS

Enclosure - Page 3 of 4

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Maximum working pressure for each type and size of hose assembly shall be as below:

	Size		ABT 3K	ABT 4K	ABT 5K	ABT 5K PLUS	ABT 6K
DN6	-04	1/4"	-	-	-	-	450 bar
DN10	-06	3/8"	-	-	-	-	445 bar
DN12	-08	1/2"	-	-	-	-	420 bar
DN16	-10	5/8"	-	-	350 bar	-	420 bar
DN19	-12	3/4"	-	280 bar	350 bar	380 bar	420 bar
DN25	-16	1"	-	280 bar	350 bar	380 bar	420 bar
DN31	-20	1 1/4"	210 bar	280 bar	350 bar	-	420 bar
DN38	-24	1 1/2"	210 bar	290 bar	350 bar	-	420 bar
DN51	-32	2"	210 bar	280 bar	350 bar	-	420 bar
DN63	-40	2 1/2"	-	-	350 bar	-	-
DN76	-48	3"	210 bar	-	350 bar	-	-

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.

This Type Approval Certificate is valid for hoses connected to the machinery/system with flange and/or threaded connection (in accordance with limitation in Pt. C, Ch. 1, Sec. 10, Tab. 15 of RINA Rules) only. Other fitting defined as mechanical joints (Rina Rules Pt. C, Ch. 1, Sec. 10, Para. 2.4.5 Fig. 2), could be accepted upon satisfactory result of prototype tests performed on hose/fitting assemblies.

### Production testing

All hose assemblies delivered under the RINA 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.

### Type Approval documentation

Alfagomma hydraulic hose fittings and adapters catalogue dated 2017-01-16

Alfagomma technical data sheets for types 3000/4000/5000 & 5000 Plus/6000

LAPI fire test reports:

2089.OIS0110/16, 2090.OIS0110/16, 2091.OIS0110/16 (ALFABIOTECH 3000)

074.OIS0110/14, 075.OIS0110/14, 076.OIS0110/14, 1049.OIS0110/18, 1050.OIS0110/18,

2314.OIS0110/18 (ALFABIOTECH 4000)

077.OIS0110/14, 078.OIS0110/14, 079.OIS0110/14, 2092.OIS0110/16, 1051.OIS0110/18,

1052.OIS0110/18, 1053.OIS0110/18, 1054.OIS0110/18, 1055.OIS0110/18, 1056.OIS0110/18,

1057.OIS0110/18, 2902.OIS0110/18, 2903.OIS0110/18 (ALFABIOTECH 5000/5000PLUS)

1058.OIS0110/18, 1059.OIS0110/18, 1060.OIS0110/18, 276.OIS0110/18, 277.OIS0110/18,

278.OIS0110/18, 080.OIS0110/14, 081.OIS0110/14, 082.OIS0110/14 (ALFABIOTECH 6000)

Rubber hose test reports dated 2014-07-22

Burst pressure test, change in length and leakage test report dated 2014-04-03 witnessed by DNV GL surveyor

Burst pressure test, change in length and leakage test report dated 2017-04-19 witnessed by DNV GL surveyor



**CERTIFICATE OF CONFORMITY**

**No. MAC356317CS**

**Enclosure - Page 4 of 4**

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Impulse test reports numbers 061/14-, 041/12-, 083/13, 053/14, 186/12, 071/13, 138/11, 197/13, 206/13, 257/14, 138/15, 169/15, 217/15A, 068/16-, 161/16, 080/17, 095/17, 141/17-, 145/17, 150/17-A, 216/17-, 217/17-, 220/17-, 221/17-, 003/18, 039/18, 058/18,080/18, 136/18  
Renewal burst pressure test report numbers: 253,254,257,259,260,261,265,266,237,238,239,240,241, 213,214,215,216,217,218,219,220,221,222,203,204,205,206,207,223,224,225,226,227,245,246,247, 228,229,230,231,232,242,243,244,208,209,210,211,212,272,273,274,275,276,233,234,235,236,248, 249,250,251,252,255,256,258,262,263,264,198,199,200,201,202,267,268,269,270,271,277,278,279,280, 281

**Tests carried out**

Dimensional check, change in length, burst pressure, proof pressure , impulse test, oil resistance test, ozone resistance test, cold flexibility test, cover adhesion test, 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.

**Genova May 2, 2019**

