



## Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

<b>Manufacturer</b>	<b>ALFAGOMMA HYDRAULIC S.p.A.</b>
<b>Address</b>	Via Enrico Mattei, 6, Castelnuovo Vomano (TE), 64020, Italy
<b>Type</b>	Flexible Hoses
<b>Description</b>	Fire resistant and fluid resistant synthetic rubber hose reinforced by four/six high tensile steel spirals.
<b>Trade Name</b>	Alfabiotech Evolution 4000, 5000, 5000 plus, 6000, Dunlop Hiflex Powerflexbio 4k, 5k, 5k plus, 6k Minetuff Extra,
<b>Application</b>	Use in essential and non-essential piping systems on LR classed ships for hydraulic, fuel oil, lubrication, antifreeze solution, air and water systems.
<b>Specified Standard</b>	Lloyd's Register's Rules and Regulations for the Classification of Ships, July 2025 Lloyd's Register's Type Approval Test Specification No. 2, December 2020
<b>Ratings</b>	see Appendix
<b>Additional Tests</b>	30 minutes wet fire endurance test acc. to ISO 15540 ISO 18752 except vacuum test
<b>Other Conditions</b>	Flexible hoses are to be limited to a length necessary to provide for relative movement between fixed and flexibly mounted items of machinery/equipment

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or systems. Flexible hose assemblies for essential services or containing flammable substances are not to exceed 1,5 m in length.

Installation is to be in accordance with the requirements of the Rules and Regulations for the Classification of Ships, Part 5, Chapter 12, Section 7.

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid Certificate.

**Previous Version:** LR25188982TA

The Design Appraisal Document TSO/23-002725-P-1 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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## Appendix

### RATINGS

#### Alfabiotech Evolution 4000 – Minetuff / Dunlop Hiflex Powerflexbio 4k Minetuff Extra

	DN12 to DN32	DN38	DN51
Design Pressure (bar)	280	290	280
Design Temperature (°C)	-40 to +121		

#### Alfabiotech Evolution 5000 – Minetuff / Dunlop Hiflex Powerflexbio 5k Minetuff Extra

	DN16 to DN51
Design Pressure (bar)	350
Design Temperature (°C)	-40 to +121

#### Alfabiotech Evolution 5000 plus – Minetuff / Dunlop Hiflex Powerflexbio 5k Plus Minetuff Extra

	DN19 & DN25
Design Pressure (bar)	380
Design Temperature (°C)	-40 to +121

#### Alfabiotech Evolution 6000 – Minetuff / Dunlop Hiflex Powerflexbio 6k Minetuff Extra

	DN6	DN10	DN12 to DN51
Design Pressure (bar)	450	445	420
Design Temperature (°C)	-40 to +121		



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## PLACE OF PRODUCTION

Alfagomma Hydraulic S.p.A  
Via Enrico Mattei, 6 64020 Castelnuovo Vomano TE Italy

Alfagomma Hydraulic SpA,  
zona Ind.le Piano Lago, 87050 Figline Vegliaturo (CS)

Alfagomma Hydraulic SpA,  
Via dell'Industria, 12 - 20882 Bellusco (MB) – Italy (centro di assemblaggio)

Alfagomma KOREA Co., Ltd.  
15, Julteo-gil, Yanggam-myeon, Hwaseong-si, Gyeonggi-do, Republic of Korea, 18630

Alfagomma UK  
43 Wilcock Road Old Boston Trading Estate, Haydock – UK

Dunlop Hiflex AB Scandinavia  
Seldonsvägen 2, 301 80 Halmstad, Sweden

Dunlop Hiflex Oy Finlandia  
Jasperintie 320, FI-33960 Pirkkala

Dunlop Hiflex OY, Turku, Finland  
Orikedonkatu 8, 20380 Turku

Alfagomma (Ningbo) Co. Ltd.  
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