



TYPE APPROVAL CERTIFICATE

Certificate No. : MIL41487-HS001 **Initial Approval :** 13th February, 2014
Product : Flexible Rubber Hose Assembly
Manufacturer : Alfagomma Hydraulic S.p.A.
Via Enrico Mattei 6, 64020 Castelnuovo Vomano (TE), Italy

Product Description : Type ;
- Dunlop 122 1SN, Alfagomma Flexor 1SN/1AT-HF
- Dunlop 222 2SN, Alfagomma Flexor 2SN/2AT-HF
- Dunlop 241 Series, Alfagomma Flexopak 2
- Dunlop SP33 Series
- Dunlop 790 4SH, Alfagomma Flexor 4SH
- Dunlop 713L, 713G, Alfagomma Flexor 13
- Dunlop powerflexbio 3000/4000/5000/5000 Plus/6000(Tuflex)
- Alfabiotech 3000/4000/5000/5000 Plus/6000(Supertuff)

" See Appendix 1 "

Approval Condition : " See Appendix 1 "

THIS IS TO CERTIFY that the above-mentioned product has been approved in accordance with the relevant requirement of this Society's Rules and / or of the recognized standards as follows.

Pt. 5, Ch. 6, Sec. 1 of the Rules for the Classification of Steel Ships.

This Certificate is valid until 12th February, 2024

Issued at Busan, Korea on 3rd December, 2020



This certificate is signed electronically in accordance with IMO FAL.5/Circ.39/Rev.2. Validation and authentication of the certificate can be confirmed from "<http://e-cert.krs.co.kr>" by using the tracking No (ME20042730184) and certificate No.(MIL41487-HS001).



KOREAN REGISTER

General Manager of
Marine & Ocean Equipment Team

- Note :**
1. This certificate will be valid subject to complying with the approval conditions described on the certificate and/or on the Rules of this Society.
 2. This certificate will be invalid from the expiry date aforementioned unless the extension or renewal has been granted to the applicant or the manufacturer.
 3. Any significant modifications or changes in design or construction to the above product without approval from this Society will render this certificate invalid.
 4. Should the specified rules, regulations or standards be amended during the validity of this certificate, the product is to be re-approved by this Society in accordance with the requirements as amended.

Appendix 1

Product Description and/or Approval Condition

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1. Product Descriptions ;

Assembly Type	Max. Working Press. (bar)	Working Temperature(°C)	Size (inch)
Dunlop 122 1SN, Alfagomma Flexor 1SN/1AT-HF	40 ~ 225	-40 ~ 100	1/4 ~ 2
Dunlop 222 2SN, Alfagomma Flexor 2SN/2AT-HF	80 ~ 400	-40 ~ 100	1/4 ~ 2
Dunlop 241 Series, Alfagomma Flexopak 2	100 ~ 420	-40 ~ 100	1/4 ~ 2
Dunlop SP33 Series	240 ~ 500	-40 ~ 100	3/8 ~ 1 1/4
Dunlop 790 4SH, Alfagomma Flexor 4SH	250 ~ 420	-40 ~ 100	3/4 ~ 2
Dunlop 713L, 713G, Alfagomma Flexor 13	350 ~ 380	-40 ~ 120	3/4 ~ 2
Dunlop powerflexbio 3000 (Tuflex), Alfabiotech 3000 (Supertuff)	210	-40 ~ 120	1 1/4 ~ 3
Dunlop powerflexbio 4000 (Tuflex), Alfabiotech 4000 (Supertuff)	280	-40 ~ 120	1/2 ~ 2
Dunlop Hiflex powerflexbio 5000 (Tuflex), Alfagomma Alfabiotech 5000 (Supertuff)	350	-40 ~ 120	5/8 ~ 3
Dunlop Hiflex powerflexbio 5000 Plus (Tuflex), Alfagomma Alfabiotech 5000 Plus (Supertuff)	380	-40 ~ 120	3/4 ~ 1
Dunlop powerflexbio 6000 (Tuflex), Alfagomma Alfabiotech 6000 (Supertuff)	420 ~ 450	-40 ~ 120	1/4 ~ 2

1) Dunlop 122 1SN, Alfagomma Flexor 1SN/1AT-HF

(1) Specification of materials

- Tube : Oil resistant synthetic rubber
- Cover : Abrasion, ozone and hydrocarbon resistant synthetic rubber
- Reinforcement : One high tensile steel braid

(2) Individual Approval conditions

This approval is based on the Test reports for dimensional check, change in length, proof, burst, impulse, cold flexibility test issued by Dunlop Hiflex and fire resistance test no. 1666.OIS0110/10 & 1667.OIS0110/10 & 1668.OIS0110/10 dated on 26 Nov, 2010 issued by LABORATORIO PREVENZIONE INCENDI s.r.l.

2) Dunlop 222 2SN, Alfagomma 2SN/2AT-HF

(1) Specification of materials

- Tube : Oil resistant synthetic rubber
- Cover : Abrasion, ozone and hydrocarbon resistant synthetic rubber
- Reinforcement: Two high tensile steel braids

(2) Individual Approval conditions

This approval is based on the Test reports for dimensional check, change in length, proof, burst, impulse, cold flexibility test issued by Dunlop Hiflex and fire resistance test no. 218.OIS0110/05 & 222.OIS0110/05 dated 07, Mar. 2005 and 271.OIS0110/05 & 270.OIS0110/05 & 274.OIS0110/05 dated 08, Mar. 2005 and 159.OIS0110/05 dated 16, Feb. 2005 issued by LABORATORIO PREVENZIONE INCENDI s.r.l.

3) Dunlop 241 Series, Alfagomma Flexopak 2

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- (1) Specification of materials
 - Tube : Oil resistant synthetic rubber
 - Cover : Abrasion, oil, water and ozone resistant synthetic rubber
 - Reinforcement: Two high tensile steel braids
- (2) Individual Approval conditions

This approval is based on the Test reports for dimensional check, change in length, burst, impulse, ozone resistance, cold flexibility, oil resistance, adhesion and abrasion resistance test issued by Dunlop Hiflex and fire resistance test no. 527. OIS0110/04 & 525. OIS0110/04 & 528. OIS0110/04 dated 18, Jun. 2004 issued by LABORATORIO PREVENZIONE INCENDI s.r.l.

4) Dunlop SP33 Series

- (1) Specification of materials
 - Tube : Oil resistant synthetic rubber
 - Cover : Weather, oil, abrasion and ozone resistant synthetic rubber
 - Reinforcement : Three high tensile steel braids
- (2) Individual Approval conditions

This approval is based on the Test reports for dimensional check, change in length, burst, impulse, ozone resistance, cold flexibility, oil resistance, adhesion and abrasion resistance test issued by Dunlop Hiflex and fire resistance test no. 530. OIS0110/04 & 531. OIS0110/04 dated 18, Jun. 2004 issued by LABORATORIO PREVENZIONE INCENDI s.r.l.

5) Dunlop 790 4SH, Alfacomma Flexor 4SH

- (1) Specification of materials
 - Tube : Oil resistant synthetic cover
 - Cover : Abrasion, ozone and hydrocarbon resistant synthetic rubber
 - Reinforcement : Four high tensile steel spirals (4S)
- (2) Individual Approval conditions

This approval is based on the Test reports for dimensional check, change in length, proof, burst, impulse, cold flexibility test issued by Dunlop Hiflex and fire resistance test no. 218. OIS0110/05 & 222. OIS0110/05 dated 07, Mar. 2005 and 271. OIS0110/05 & 270. OIS0110/05 & 274. OIS0110/05 dated 08, Mar. 2005 and 159. OIS0110/05 dated 16, Feb. 2005 issued by LABORATORIO PREVENZIONE INCENDI s.r.l.

6) Dunlop 713L, 713G, Alfacomma Flexor 13

- (1) Specification of materials
 - Tube : Oil resistant synthetic rubber
 - Cover : Abrasion, ozone and hydrocarbon resistant synthetic rubber
 - Reinforcement: Four or six high tensile steel spirals (4S/6S)
- (2) Individual Approval conditions

This approval is based on the Test reports for dimensional check, change in length, proof, burst, impulse, cold flexibility test issued by Dunlop Hiflex and fire resistance test no. 158. OIS0110/05 dated on 16 Feb, 2005 and 276. OIS0110/05 & 277. OIS0110/05 dated on 08, Mar. 2005 issued by LABORATORIO PREVENZIONE INCENDI s.r.l.

7) Dunlop powerflexbio 3000/4000/5000/5000 Plus/6000 (Tuflex), Alfabiotech 3000/4000/5000/5000 Plus/6000 (Supertuff)

- (1) Specification of materials
 - Tube : Oil resistant synthetic rubber and biodegradable hydraulic fluids
 - Cover : Abrasion, ozone and hydrocarbon resistant synthetic rubber.
MSHA (Minetuff and supertuff cover).
 - 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 5000 Plus	: Four high tensile steel spirals
Type 6000	: Four/six high tensile steel spirals
- (2) Individual Approval conditions

This approval is based on the Test reports for dimensional check, change in length, proof, burst, impulse, cold flexibility test issued by Dunlop Hiflex and fire

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resistance test no. 2089.OIS0110/16, 2090.OIS0110/16, 2091.OIS0110/16, 074.OIS0110/14, 075.OIS0110/14, 076.OIS0110/14, 077.OIS0110/14, 078.OIS0110/14, 079.OIS0110/14, 080.OIS0110/14, 081.OIS0110/14, 082.OIS0110/14, 2092.OIS0110/16, 276.OIS0110/18, 277.OIS0110/18, 278.OIS0110/18, 2314.OIS0110/18, 2902.OIS0110/18, 2903.OIS0110/18, 1049.OIS0110/18, 1050.OIS0110/18, 1051.OIS0110/18, 1052.OIS0110/18, 1053.OIS0110/18, 1054.OIS0110/18, 1055.OIS0110/18, 1056.OIS0110/18, 1057.OIS0110/18, 1058.OIS0110/18, 1059.OIS0110/18, 1060.OIS0110/18 issued by LABORATORIO PREVENZIONE INCENDI s.r.l.

2. Application :

- 1) Hydraulic, fuel and lubricating oil, compressed air, fresh water & sanitary systems

3. Common Approval conditions :

- 1) The hoses are to be used as short as possible in the length of the permanent piping system where flexibility is required.
- 2) Flexible hoses are to be installed in clearly visible and readily accessible locations.
- 3) Where flexible pipes are intended to be used in piping systems conveying flammable fluids that are in close proximity of heated surfaces, the risk of ignition, due to failure of the pipe assembly and subsequent release of fluids, is to be mitigated, as far as practicable, by the use of screens or other similar protection to the satisfaction of the Society.
- 4) Individual Product Certification is required where the flexible hoses are intended to use for Class I & II piping system.
- 5) Coupling / Hose manufacturers :
 - Dunlop Hiflex AB: Seldonsvagen 2, Box 536, 302 62 Halmstad, Sweden
 - Dunlop Hiflex OY: Orikedonkato 11, 20380 Turku, Finland
 - Alfagomma Korea Co Ltd: 15, Julteo-gil, Yanggam-Myeon, 18630 Hwaseong-Si, Kyungki-Do, Republic of Korea
- 6) Flexible Hoses should be marked with the following items.
 - Hose manufacturer's name or trademark
 - Date of manufacture (Month/Year)
 - Designation Type
 - Nominal diameter, Pressure rating, Temperature rating

< The end of Certificate >