

TYPE APPROVAL CERTIFICATE

This is to certify:**That the TBT-Free Anti-Fouling Systems**

with type designation(s)
**A-LF-Sea 150, A-LF-Sea 250, A-LF-Sea 600,
ECOLOFLEX SPC 150 HyB and ECOLOFLEX SPC 200 (Z)**

Issued to

**Nippon Paint Marine Korea Co., Ltd.
Busan, Republic of Korea**

is found to comply with

DNV GL class programme DNVGL-CP-0110 – Type approval – Anti-fouling systems**Application :****Organotin-free self-polishing hydrolysing anti-fouling system.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2019-05-21**This Certificate is valid until **2024-05-20**.for **DNV GL**DNV GL local station: **Gimhae Station**Approval Engineer: **Gisle Hersvik**

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Rikard Törnqvist
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.



Product description

Organotin-free self-polishing hydrolysing anti-fouling paints:

- **A-LF-Sea 150, A-LF-Sea 250 and A-LF-Sea 600**
- **ECOLOFLEX SPC 150 HyB and ECOLOFLEX SPC 200 (Z)**

Colours:

The products may be available in various colours. Please contact the local Nippon Paint Representative for details.

Active Ingredients:

CAS No. 1317-39-1 Cuprous Oxide

CAS No. 14915-37-8 Copper pyrrhione [Copper, bis (1,hydroxy-2(1H)-pyridinethionato O,S)-]

Manufactured by

Dong Nam Chemical Co., Ltd., 118-51, Gimhae-daero, Jinyoeng-eup, Gimhae-si, Gyeongsangnam-do, Korea

DNV GL local station: Gimhae

Responsibility

The Company (stated on the front page of this Certificate) takes the responsibility that both design and production are in compliance with Rules, Standards and/or Regulations listed on page 1 of this certificate.

Application/Limitation

The issuance of this certificate is solely connected to the control of the Anti-Fouling System, AFS, with regard to compliance with the International Convention on the Control of Harmful Anti-Fouling Systems on Ships.

It does not cover verification of surface preparation, corrosion protection, fire, health and safety precautions, and durability of the AFS or environmental properties other than regulated by the Convention.

Type Approval documentation

Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**, with the following test results (ref. Test Reports from FITI Testing & Research Institute, Korea of 2014-02-03):

- | | |
|---|---|
| - A-LF-Sea 150 (Brown): | <0.0001 % tin (No TBT-compounds detected) |
| - A-LF-Sea 250 (Brown): | <0.0001 % tin (No TBT-compounds detected) |
| - A-LF-Sea 600 (Brown): | <0.0001 % tin (No TBT-compounds detected) |
| - ECOLOFLEX SPC 150 HyB (Light Brown): | <0.0010 % tin (No TBT-compounds detected) |
| - ECOLOFLEX SPC 200 (Light Brown Z): | <0.0010 % tin (No TBT-compounds detected) |

Marking of product

Product shall be marked with *manufacturer's name*; **Nippon Paint Marine (Korea) Co., Ltd., Korea**, *production plant* and *type designation*.

The marking is to be carried out in such a way that it is visible, legible and indelible. The marking of product is to enable traceability to the DNV GL Type Approval Certificate.

Job Id: **262.1-016712-2**
Certificate No: **TAK00001M3**

Periodical assessment

The scope of the Periodical Assessment is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

Periodical Assessment to be performed after 2 and 3.5 years (Certificate Retention) and at renewal after 5 years (Certificate Renewal).

The main elements of the Periodical Assessment are to:

- Ensure that **Type Approval documentation** is available.
- Review design, materials, production process, and performance with respect to possible changes, in order to ensure compliance with **Type Approval documentation** and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and the DNV GL Type Approval Certificate.

END OF CERTIFICATE