

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV GL AS under the authority of the Government of Norway.

This is to certify:

That the Fire resisting divisions for high speed craft

with type designation(s)
60 minute load bearing carbon fiber sandwich deck

Issued to

Brødrene AA AS
HYEN, Norway

is found to comply with the requirements in the following Regulations/Standards:
Regulation (EU) 2019/1397,
item No. MED/3.34. SOLAS 74, Regulation X/3, 2000 HSC Code 7, IMO MSC.1/Circ.1457 and
IMO 2010 FTP Code

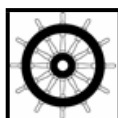
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2024-11-24**.

Issued at **Høvik** on **2019-11-25**

DNV GL local station:
Ulsteinvik

Approval Engineer:
Aleksandr Jegorov



Notified Body
No.: **0575**

for **DNV GL AS**

Roald Vårheim
Head of Notified Body

A U.S. Coast Guard approval number will be assigned to the equipment when the production module has been completed and will appear on the production module certificate (module D, E or F), as allowed by the "Agreement between the United States of America and the EEA EFTA states on the mutual recognition of Certificates of Conformity for Marine Equipment" signed 17 October 2005.



The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.

This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV GL AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.

Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.



Product description

"60 minute load bearing carbon fiber sandwich deck"

consists of a carbon fiber reinforced polymer (CFRP) sandwich deck insulated from below as following:

- 1st layer - inbetween stiffeners with 70 mm thick insulation type "SEAROX FB6040 ALU" with density of 60 kg/m³ from Rockwool AS. Insulation is fixed by means of steel pins (diam. 3 x 90 mm) with 50 x 50 mm backplate screwed to the bulkhead, perforated steel bands (0.5 mm thick and 50 mm wide) fitted between and across the stiffeners with max. c-c 300 mm and steel washer of diam. 38 mm.
- 2nd layer - inbetween stiffeners with 50 mm thick insulation type "SEAROX SL 620" with density of 100 kg/m³ from Rockwool AS. Insulation is fixed by means of 70 x 70 mm steel washers and screws (diam. 4.8 x 60 mm) to perforated steel bands with max. c-c 300 mm.
- 3^d layer - above the stiffeners with 40 mm thick insulation type "SEAROX SL 640" with density of 130 kg/m³ from Rockwool AS.
- 4th, 5th layer - above the stiffeners with 50 mm thick and and 300 wide insulation type "SEAROX SL 640" with density of 130 kg/m³ from Rockwool AS. 4th layer of insulation is fixed by means of perforated steel bands and screws (diam. 4.8 x 120 mm). 5th layer of insulation is fixed by means of 70 x 70 mm steel washers and screws (diam. 4.8 x 60 mm).

For further details see documentation under Type Examination documentation below.

Application/Limitation

Approved as a load bearing fire-resisting deck 60.

Only the combined product (insulation and CFRP structure) is approved as a fire resisting division. The product is to be installed as tested, with the details considered being the main issues. See the product description for more details.

The product as described above is in general only approved for use on vessels built according to 2000 HSC Code or Rules based on this Code (examples: yacht, navy ships, patrol boats, etc.).

CFRP structure:

Application of other CFRP materials:

The systems are in general only approved for composite cores with same materials and dimensions as tested. On a case by case basis other equivalent composites may be applied when confirmed acceptable and documented by the maker and found to be acceptable by the flag administration. The following issues are to be addressed:

- The deck shall have stiffness and mechanical properties (cold conditions) equivalent to or better than that being tested
- The materials (core, carbon fibre, resin, etc.) shall have mechanical properties at the relevant temperature range (typically 20 °C to 250 °C) equivalent to the material used in the test. The heat distortion temperature for each material, thickness of laminate and density of the core may be applied as criteria

The insulation materials has to be approved as non-combustible according to the Marine Equipment Directive and bear the Mark of Conformity.

Each product is to be supplied with its manual for installation and maintenance.

Type Examination documentation

Test Report No. 150070-21B dated 12 August 2019 from RISE Fire Research AS, Norway.

Drawings No. 520-510-23231-T-3 dated 4 April 2019, No. 520-510-23233-T-3 dated 12 March 2019 from manufacturer.

Tests carried out

Tested according IMO 2010 FTP Code part 11.



Job Id: **344.1-009591-1**
Certificate No: **MEDB00005R3**

Marking of product

The product is to be marked with name and address of manufacturer, type designation, fire technical rating, the MED Mark of Conformity and USCG Approval Number if applicable (see first page).