

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 the Kingdom of Norway.

This is to certify:

That the Fire resisting divisions for high speed craft

with type designation(s)

60 minute Load-bearing Composite Deck - FireMaster Marine Plus Blanket

Issued to

Thermal Ceramics UK Ltd
WIRRAL MERSEYSIDE, United Kingdom

is found to comply with the requirements in the following Regulations/Standards:

Regulation **(EU) 2015/559,**

Annex A.1, item No. A.1/3.34 and Annex B, Module B in the Directive; SOLAS 74, Regulation X/3, 2000 HSC Code 7 and IMO 2010 FTP Code

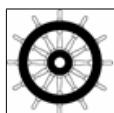
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2021-11-03**.

Issued at **Høvik** on **2016-11-04**

DNV GL local station:
Manchester

Approval Engineer:
Helge Bjørnarå



Notified Body
No.: **0575**

for **DNV GL AS**

Vidar Dolonen
Head of Notified Body

Product description

60 minute Load-bearing Composite Deck - FireMaster Marine Plus Blanket, consists of a fire reinforced polymer (FRP) sandwich insulated on the exposed side (underside deck) with 4 x 25 mm FireMaster Marine Plus Blanket secured with washers and special stainless steel pins with self-tapping screws. The insulation shall follow the contours of the stiffeners. Aluminium foil shall be applied between the insulation layers.

The approved product is described in detail below. The product is in general only approved for use on vessels built according to HSC Code or rules based on this Code (e.g. yachts, navy ships, patrol boats etc.).

Application/Limitation

Approved as a loadbearing fire-resisting deck 60.

Only the combined product (insulation and FRP structure) is approved as a fire resisting division. The product is to be installed as tested, with the below details considered being the main issues. See the product's "Fire Protection Systems Information" for more details.

Insulation, foil and pins

The insulation shall be applied on the underside of the structural FRP deck with 4 x 25 mm FireMaster Marine Plus Blanket. The inner layer (close to FRP) has a density of 64 kg/m³, whereas the three outer layers have a density of 70 kg/m³. The transversal joints between the layers are to be installed in a staggered pattern, whereas the longitudinal joints shall be pressed tight together (the nominal blanket width is 610 mm and is to be compressed to a width of 580 mm to ensure this compression).

An aluminium foil has to be provided between each insulation layer (between layer one/two, two/three and three/four). This foil can be an integrated part of the insulation.

The insulation and foil shall be secured with 38 mm friction fit washers and special stainless steel pins (typically 125 mm long, 3 mm in diameter) with 5 mm self-tapping screws (penetrating 30 mm into skin/core). The pins are to be installed with a nominal spacing of 240 mm across the layers, 270 mm along the layers, whereas pins at the joints between blankets shall have a nominal spacing of 100 mm from the blanket edge.

FRP structure

The insulation was tested on a deck with the following specification:

Laminate:	E-glass fibres (biaxial 0/90°, 1200 or 1600 g/m ²) and vinyl ester resin, (thickness of entire laminate: 1.0 mm or 1.4 mm)
Core:	Divinycell H80/GPC1 (semi-rigid PVC core)

The sandwich deck was assembled with a 50 mm Divinycell core with a 1.4 mm laminate on top of the core and 1.0 mm laminate under the core. Two stiffeners of 54 x 205 (width x height) were joined to the deck with infusion. The laminates on the stiffeners were of 2.0 mm thickness (sides) and 3.6 mm thickness (bottom). The spacing between stiffeners was 2.0 m (the deck was only 3.2 m wide and extra load was added to simulate an "effective spacing" between stiffeners of 2.0 m).

Application of other FRP 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:

1. The deck shall have stiffness and mechanical properties (cold conditions) equivalent to or better than that being tested
2. The materials (core, 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



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distortion temperature for each material, thickness of laminate and density of the core may be applied as criteria

The insulation material FireMaster Marine Plus Blanket has to be approved 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. BRm6075-04B dated 24 May 2006 from SP, Borås, Sweden.

Thermal Ceramics Fire Protection Systems Information, reference No. FM-MS 05 PW and No. FM 4.72, Rev. 1.

Tests carried out

Tested according to IMO FTP Code Part 11 (IMO Res. MSC.45(65) and IMO Res. A.754(18)) and in compliance with IMO 2010 FTP Code Ch. 8.

Marking of product

The installation is to be marked with name and address of manufacturer, type designation, fire-technical rating and Mark of Conformity (see page 1).