

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Class H Fire Wall and Bulkhead

with type designation(s)

THERMO-LAG 3000 - Bulkhead

Issued to

Carboline Company

Saint Louis MO, United States

is found to comply with

Det Norske Veritas' Offshore Standards

Application :

Approved for use as fire retarding bulkhead of class H-0/H-60/H-120.

Restricted application: Fire against insulated side.

This Certificate is valid until **2018-12-31**.

Issued at **Høvik** on **2015-05-14**

DNV GL local station: **Houston**

Approval Engineer: **Helge Bjørnarå**

for **DNV GL**

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Petter Langnes
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.

Certificate No: **F-21145**
File No: **471.72**
Job Id: **262.1-003427-5**

Product description

"THERMO-LAG 3000" – Bulkhead

composed of minimum 8.0 mm steel bulkhead insulated on exposed side with an epoxy based intumescent coating system "Thermo-Lag 3000 Subliming Material", reinforced with High Temperature Fabric (HTF) or metal mesh reinforcement.

Table 1: H-deck rating and corresponding thickness of "THERMO-LAG 3000":

Rating	DFT	Comment
H-0	4,0 mm	No temperature limit
H-60	8,5 mm	Max temperature rise of 140 °C / 180 °C (avg. / single) after 60 min
H-120	11,0 mm	Max temperature rise of 140 °C / 180 °C (avg. / single) after 120 min

The materials are manufactured at the following locations:

- Carboline Company, Dayton, Nevada, USA
- Carboline Company, Lake Charles, Louisiana, USA

Application/Limitation

Approved for use as fire retarding bulkhead of class H-0, H-60 and H-120.

Restricted application: Fire against insulated side.

The protective coating is not defined as non-combustible and should not be used in accommodation or in enclosed areas.

The approval refers only to the fire resistance properties of the system.

The application of the protective coating is to be performed in accordance with the manufacturer's application manual. Alternative primers and topcoats may be used provided they have been tested and approved by the manufacture.

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

Type Approval documentation

Certification in accordance with Standard for Certification No. 1.2, Type Approval, January 2013.

Test reports Nos. 15521-101991, 15521-101992 and 15521-101993 dated 15 April 1998 from Omega Point Laboratories, Elmendorf, Texas, USA.

Letter dated 9 July 1998 from Nu-Chem Inc./Thermal science Inc.

Tests carried out

Tested according to IMO Resolution A.754(18) with furnace temperature following the hydrocarbon curve according to ISO 834-3.

Marking of product

The product or packing is to be marked with name of manufacturer, type designation and fire-technical rating.

Periodical assessment

DNV GL's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in Standard for Certification No. 1.2 Type Approval Item 4.