DNV·GL

Certificate No:
TAK000011M

TYPE EXAMINATION CERTIFICATE

This is to certify:

That the Insulation Materials for Gas Carriers

with type designation(s)
Low Density Foam: HF-50C, CO2 Blown

Issued to
Hankuk Carbon Co., Ltd.
Miryang-si, Gyeongsangnam-do, Korea

is found to comply with
Gaztransport & Technigaz Specification Nr. M3009, Low Density Foam (LDF), Rev. 02, December 2015

Application :

For use in GTT MARK III/V Cargo Containment System of LG carriers.

Issued at **Høvik** on **2017-12-11**
This Certificate is valid until **2019-06-30**.
DNV GL local station: **Gimhae Station**

Approval Engineer: **Gisle Hersvik**

for **DNV GL**

Martin Strande
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 Examination Certificate and not to the approval of equipment/systems installed.

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Job Id: **262.1-019434-3**
Certificate No: **TAK000011M**

Product description

HF-50C; Low density polyurethane foam.
Blowing agent: CO_2

Place of Manufacture

Hankuk Carbon Co., Ltd., 719-13, Sangnam-Ro, Sangnam-Myeon, Miryang-Si, Gyeongnam, Republic of Korea

Application/Limitation

The material is only approved for use in MARK III/V CCS LG carriers built under licence from GAZTRANSPORT & TECHNIGAZ SAs (GTT).

Deliveries to actual shipbuilding projects shall be in compliance with the "Low Density Foam (LDF)" Specification, GTT document no. M3009, rev. 02 dated December 2015, and the product shall have a valid approval from GTT.

Type Examination documentation

Tests carried out

Type Testing carried out in accordance with **Type Examination documentation**.

Marking of product

Product/package shall be marked with the *manufacturer's name*; **Hankuk Carbon Co., Ltd., Gyeongnam, Korea**, or *manufacturer's identification letter(s)*, *Lot No., Size, Quantity* 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 Examination Certificate.

Periodical assessment

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

Periodical Assessment to be performed after two (2) years (Certificate Retention) and at renewal after four (4) years (Certificate Renewal).

The main elements of the Periodical Assessment are to:

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

END OF CERTIFICATE