Certificate No:
TAK0000252

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Support Materials for Gas Carriers

with type designation(s)
UniCore 8480 LQ, UniCore 8480 PT

Issued to
Uni-Tech Co., Ltd.
Ansan-si, Gyeonggi-do, **Korea, Republic of**

is found to comply with
DNV rules for classification – Ships

Application :

Mould of supports made of laminated densified wood for LPG/LEG/LNG gas tanks.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Hamburg** on **2022-10-26**
This Certificate is valid until **2027-10-25**.
DNV local station: **Seoul**

Approval Engineer: **Joachim Rehbein**

for **DNV**

Thorsten Lohmann
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

UniCore 8480 LQ, UniCore 8480 PT: Two-component epoxy-based pumpable/pourable compound for foundation chocking.

Assessed production site
Unitech Co., Ltd.
45, Byeolmang-ro 459beon-gil,
Danwon-gu, Ansan-si,
Gyeonggi-do, Korea

Application/Limitation

The approval is valid for foundation chocking of liquefied gas tank supports, i.e. between the cargo tanks and the surrounding hull structure. Please refer to DNV-CG-0133, *Liquefied gas carriers with independent prismatic tanks of type A and B*, Sec. 3 [4.1] and DNV-RU-SHIP, Pt.5 Ch.7 Sec.1 [5.3] Table 8.

Following mean values have been evaluated during type testing:

Test temperature			**23°C**		**-170°C**	
UniCore 8480 variant			**LQ**	**PT**	**LQ**	**PT**
Property	**Test standard**	**unit**				
Compressive strength	ASTM D 695	MPa	103.64	112.37	386.35	390.38
Compressive modulus	ASTM D 695	MPa	5287	4912	6440	6086
Shear strength (steel)	ISO 4587	MPa	15.15	13.82	15.84	12.76
Shear strength (plywood)	ISO 4587	MPa	4.69	4.76	5.46	7.23

This approval is solely connected to the strength properties of the chocking compound. The approval does not include any evaluation of toxicity, contamination, pollution, or fire technical properties.

The Type Approval Certificate is invalid if the formulation of product is changed to a degree deemed significant by DNV.

Other conditions;
The actual use of the material as tank supports is subject to approval in each case.

Manufacturer's instructions to surface preparation, casting and curing of the compound are to be followed.
Application temperature according to manufacturer's instructions -170°C to 40°C.

A Barcol hardness test to be performed with a result of at least 30.

Type Approval documentation

Tests carried out

Tests carried out in accordance with **Type Approval documentation**.

Marking of product

Product/package shall be marked with *manufacturer's name*; **Uni-Tech Co., Ltd.., Korea**, or *trademark* and *type number identification*.

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 Type Approval Certificate.

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 assessments (for Certificate Retention and Certificate Renewal) shall be performed according to DNV-CP-0338.

This certificate is only valid if required Periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in https://approvalfinder.dnvgl.com

END OF CERTIFICATE