

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Plastic Pipes, Fibre Reinforced Thermosetting

with type designation(s)

HGP-E16C; PN16 bar Filament Wound Glassfibre Reinforced Epoxy (GRE) Pipes and Fittings

Issued to

HLB Co., Ltd.

Ulsan, Republic of Korea

is found to comply with

Det Norske Veritas' Type Approval Programme 1-501.1, 2011, Fibre Reinforced Thermosetting Plastic Pipes

Det Norske Veritas' Rules for Classification of Ships

IMO Resolution A.753(18). Guidelines for the Application of Plastic Pipes on Ships

Application :

For installation according to DNV Rules and Manufacturer's Specification. The piping system is conductive, for installations in gas hazardous areas. The piping system is approved to Fire Endurance L3 according to IMO Resolution A.753(18), and Low Flame Spread according to ASTM D635-10.

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

This Certificate is valid until **2017-06-30**.

Issued at **Høvik** on **2015-08-24**

DNV GL local station: **Ulsan**

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.



Job Id: **262.1-010987-2**
Certificate No: **TAK000002M**

The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product description

HGP-E16C; Filament Wound Glassfibre Reinforced Epoxy (GRE) Pipes and Fittings

Sizes / Nominal diameter: 3/5 – 28 inch (15 – 700 mm)
Maximum Operating Temperature: 93°C
Design Internal Pressure: 16 bar
Design External Pressure: 5 bar

Pipes: Minimum reinforced wall thickness in mm

DN [mm]	15	20	25	32	40	50	65	80	100	125	150
Thickness [mm]	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.5	5.5

DN [mm]	200	250	300	350	400	450	500	550	600	650	700
Thickness [mm]	6.5	8.0	9.0	9.5	10.0	11.5	13.0	15.0	16.5	18.5	19.5

Fittings:

Elbows, Tees, Saddles, Reducers, Flanges, Sockets
- other fittings to be tested prior to installation in classed vessels.

Joint Methods:

Bell & Spigot, Butt & Wrap, Flange Joint, Expansion Coupling Joint.

Application/Limitation

For installation according to DNV Rules and Manufacturer's Specification.

Piping system is approved as conductive, for installations in gas hazardous areas.

Piping system is approved to Fire Endurance L3 according to IMO Resolution A.753(18).

Piping system is approved to Low Flame Spread, according to ASTM D635-10 (accepted as an alternative to IMO Resolution A.653(16)).

Test of conductivity is to be carried out after installation of piping system.

Approved mounting/joining specification to be followed.

Type Approval documentation

Tests carried out

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

Marking of product

The pipes and fittings are to be marked. The marking shall at least include the following information:

- *Product name*
- *Manufacturers name*
- *Pressure rating*
- *Temperature rating*

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

END OF CERTIFICATE