

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Plastic Pipes, Fibre Reinforced Thermosetting

with type designation(s)
XH-M200/XH-M200C

Issued to

NANJING XINHE COMPOSITES CO.,LTD
Nanjing, China

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018
DNV GL class programme DNVGL-CP-0070 – Type approval – Fibre reinforced thermosetting plastic piping systems

Application :

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

Issued at **Hamburg** on **2020-04-09**

This Certificate is valid until **2025-04-08**.

DNV GL local station: **Nanjing NB & CMC**

for **DNV GL**

Approval Engineer: **Hagen Markus**

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Olaf Drews
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.



Product description

Filament Wound Fibre Reinforced Thermosetting Epoxy Resin Pipe and Fittings
Conductive and Non – Conductive.

Design Types	Nominal Diameter DN	Nominal Pressure PN	External pressure resistance
XH-M200 (non-conductive)	25 - 1200	16	5.0 bar
XH-M200C (conductive)			

Size range and wall thickness of pipes

Structural wall thickness in mm (excl. internal liner 0.5 and 0.2mm surface protection layer)

Nominal Diameter DN	Outer Diameter mm	Structural Wall Thickness mm	Nominal Diameter DN	Outer Diameter mm	Structural Wall Thickness mm
25	35	4.3	600	617.2	15.4
32	42	4.3	650	669.8	16.7
40	49	4.3	700	722.4	18.0
50	59	4.3	750a	760.2	19.4
65	74	4.3	750b	791.8	20.2
80	86	4.3	800a	812.8	20.7
100	108	4.3	800b	844.4	21.5
125	134.4	5.5	850a	865.4	22.0
150	162.6	6.1	850b	897.0	22.8
200	212.4	6.5	900a	918.2	23.4
250	266.4	8.5	900b	949.8	24.2
300	319.0	9.8	1000a	1023.2	25.9
350	358.0	10.8	1000b	1054.8	26.7
400	410.2	11.9	1100a	1128.2	28.4
450	457.6	12.1	1100b	1159.8	29.2
500	512.0	12.8	1200a	1234.2	31.4
550	564.6	14.1	1200b	1265.8	32.2

Standard fittings

Elbows (15°, 22,5°, 30°, 45°, 60°, 90°), pipe joint, straight tee, reducer tee, tees 45°, concentric/eccentric reducer, coupling (adhesive bonding).

Joining methods

Adhesive bonding, flange connections, expansion joint.

Application/Limitation

The XH-M200 (non-conductive) and XH-M200C (conductive) GRE piping system are type approved for application in piping systems as listed in "Table 1- Fire endurance requirements matrix" of the DNVGL Rules Pt.4, Ch.6, Section 2.

Approved installation locations are where "0" or "L3" is specified in the matrix.

Appropriate footnotes are to be observed.

Not approved for installation locations where "NA" or "X" is indicated and for installation in gas hazardous area.

For installation on Offshore units the requirements specified in the applicable DNV GL rules for classification of Offshore units (RU-OU) are to be observed.

Permissible working pressure and temperature range

Temperature	bar
-50°C up to 95°C	16

Extent of Type Tests applicable to piping system dependent on application

Fire endurance Level

Fire Endurance tests according to IMO Resolution A.753 (18), Appendix 2 has been successfully tested on the following joining methods.

Test level	Type of connection ¹	Fire Barrier	Approved size range O.D.
L3	Adhesive bonding	None	> 152mm

Flame spread

Surface flame spread characteristics has been tested acc. to FTP Code Annex 1, Part 5 – Surface flammability

Smoke and toxicity

The XH-M200 GRE piping system has been tested acc. to FTP Code Annex 1, Part 2 – Smoke generation and toxicity.

Electrical conductivity

The XH-M200 system (non-conductive) is limited for installation in non-gas hazardous areas. Type XH-M200C (conductive) piping system is approved for installation in gas hazardous areas. Conductivity test is to be carried out after installation of piping system on board ship.

Passenger vessels

For application on passenger vessels additional requirements specified in the Rules and Regulations of the appropriate flag state authority may have to be observed.

Design and installation specification for piping systems

For the design and installation of piping systems the following documents are to be observed:

- NNCC "FRP Installation Manual"
- NNCC "Specification for prefabricated bonding process for GRE pipeline"

In addition, the DNVGL Rules Pt.4, Ch.6 – Section 10 – Para. 4 Installation of Plastic Piping Systems are to be observed.

Bulkhead penetration

Pipe penetration through watertight bulkheads or decks as well as through fire divisions shall be type approved unless the penetration pipe is welded into the bulkhead/deck.

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When plastic pipes pass through watertight bulkheads or decks which are also a fire division and a fire may cause flooding of watertight compartments, the watertight integrity of the bulkhead or deck is to be maintained by a metallic shut-off valve fitted at the bulkhead or deck. The operation of this valve shall be provided from above the freeboard deck.

Refer to DNV GL Rules Pt.4, Ch.6 Section 3 – 1.4 Fittings on watertight bulkheads.

On passenger vessels, where the watertight bulkhead is also a fire division, the requirements of the SOLAS Chapter II - 1, Regulation 13.2.3. are to be observed.

Marking of product

To ensure traceability from the final product to this type approval certificate each pipe or pipe spool is to be marked at least with:

Scope ¹		Example
Manufacturer's name and / or logo		 NANJING XINHE COMPOSITES CO.,LTD
Type designation / material of which the pipe or fitting is made		GRE pipes and fittings – XH-M200
Size / dimensions		DN250
Type of joining method		Adhesive bonding
Nominal design pressure PN	internal	16 bar
	external	5.0 bar
Working pressure at max. service temperature	internal	W.P. 1.6MPa @ 95°C
Conductive / non-conductive		XH-M200C / XH-M200
Date of fabrication and / or serial number		2020-03-30

Note

¹In addition, labels with the following text shall be attached to flanges which shall be joined by bolting:
"APPLY BOLTING TORQUE ACCORDING TO MANUFACTURER'S RECOMMENDATION".

Type Tests carried out

- Internal pressure short term and long term test
- External pressure ASTM D2924, Fig 2- Procedure B, External load CP-070 API 15LR
- Electrical conductivity ASTM D257, ASTM F1173
- Impact resistance ASTMD2444, API15LR, Load deformation ASTM D2412
- Bonding Procedure Qualification test ASTMD1598/ASTMD2992, HDT test, ISO 75-2:2013
- Liquid absorption ISO 8361-2:1991
- Axial tensile strength ASTM D2105-14, Cyclic Pressure Strength (Fatigue) ASTMD2143
- Fire endurance test L3
- FTP Code Annex 1, Part 2–Smoke generation and toxicity, Part 5 – Surface flammability (flame spread).

Production Testing

Each batch shall be subjected to product tests according to "Inspection and test plan (ITP) for GRE pipes & fittings CX8.1-2".



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Type Approval documentation

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNVGL-CP-0338, Sec.4.

To check the validity of this certificate, please look it up in <https://approvalfinder.dnvgl.com>

END OF CERTIFICATE