



Certificate no.:
TAK00002HN

TYPE APPROVAL CERTIFICATE

This is to certify:

that the **Plastic Piping System, Thermoplastic**

with type designation(s)
PE 100 series, conductive

issued to

Jiangsu Xinghe Group Co.,Ltd
ZHENJIANG, Jiangsu, China

is found to comply with

DNV class programme DNV-CP-0072 – Type approval – Thermoplastic piping systems

Application:

For use in essential and non-essential systems.

External pressure rating: 1 to 3 bar, refer to certificate.

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

Issued at **Hamburg** on **2025-07-22**

This Certificate is valid until **2030-07-21**.

for **DNV**

DNV local unit: **Nanjing NB & CMC**

Approval Engineer: **Joachim Rehbein**

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 USD 300 000.

Product description

Polyethylene Pipes and Fittings, conductive, inside and outside.

Nominal internal pressure classes: PN8, PN10, PN12.5

Pipes:

Nominal diameter,DN [mm]	Wall thickness, minimum [mm]								
	Base layer			Inner layer, conductive			Outer layer, conductive		
	Standard Dimension Ratio, SDR								
	SDR17	SDR13.6	SDR11	SDR17	SDR13.6	SDR11	SDR17	SDR13.6	SDR11
	Nominal Pressure, PN [bar]								
	PN8	PN10	PN12.5	PN8	PN10	PN12.5	PN8	PN10	PN12.5
63	—	4.7	5.8	—	0.5	0.5	—	0.5	0.5
75	4.5	5.6	6.8	0.5	0.5	0.5	0.5	0.5	0.5
90	5.4	6.7	8.2	0.5	0.5	0.5	0.5	0.5	0.5
110	6.6	8.1	10.0	0.5	0.5	0.5	0.5	0.5	0.5
125	7.4	9.2	11.4	0.5	0.5	0.6	0.5	0.5	0.6
140	8.3	10.3	12.7	0.5	0.5	0.6	0.5	0.5	0.6
160	9.5	11.8	14.6	0.5	0.6	0.7	0.5	0.6	0.7
180	10.7	13.3	16.4	0.6	0.7	0.8	0.6	0.7	0.8
200	11.9	14.7	18.2	0.6	0.8	0.9	0.6	0.8	0.9
225	13.4	16.6	20.5	0.7	0.8	1.0	0.7	0.8	1.0
250	14.8	18.4	22.7	0.7	0.9	1.1	0.7	0.9	1.1
280	16.6	20.6	25.4	0.8	1.0	1.2	0.8	1.0	1.2
315	18.7	23.2	28.6	0.9	1.1	1.4	0.9	1.1	1.4
355	21.1	26.1	32.2	1.0	1.3	1.6	1.0	1.3	1.6
400	23.7	29.4	36.3	1.1	1.4	1.8	1.1	1.4	1.8
450	26.7	33.1	40.9	1.3	1.6	2.0	1.3	1.6	2.0
500	29.7	36.8	45.4	1.4	1.8	2.2	1.4	1.8	2.2
560	33.2	41.2	50.8	1.6	2.0	2.5	1.6	2.0	2.5
630	37.4	46.3	57.2	1.8	2.3	2.8	1.8	2.3	2.8
710	42.1	52.2	64.5	2.1	2.6	3.2	2.1	2.6	3.2

Notes:

1: PN class based on internal pressure – short-term tests for pipe with SF=4.0

Fittings

Elbows, tees, flanges.

Joining techniques

Butt and socket fusion.

External pressure rating:

Pressure class	PN8	PN10	PN12.5
Nominal external pressure rating [bar]	1.0	2.0	3.0

Notes:

External pressure rating based on collapse pressure: Safety factor: 3.0.

For application in suction lines the vacuum pressure inside the pipe reduces the external pressure rating.

Long-term permissible service pressure at lower and elevated temperatures

Non-essential services

Temperature		-20°C up to 20°C	30°C	40°C
Maximum allowable working pressure [bar]	PN8	6.25	5.31	4.56
	PN10	7.81	6.64	5.70
	PN12.5	9.92	8.43	7.24

Notes:

- Reference ISO 15494, C=1.6/25years
- Maximum allowable working pressure calculated acc. to ISO 4427.

Essential services

Temperature		-20°C up to 20°C	30°C	40°C
Maximum allowable working pressure [bar]	PN8	4.0	3.40	2.92
	PN10	5.0	4.25	3.65
	PN12.5	6.35	5.40	4.63

Notes:

- Reference ISO 15494 and DNV-CP-0072, C=2.5/25years
- Maximum allowable working pressure calculated acc. to ISO 4427.

Production place

Jiangsu Xinghe Group Co. Ltd., Zhenjiang City, Jiangsu Province, China

Application/Limitation

For installation in accordance with DNV Rules and Manufacturer's Specification.

The PE100 piping system is type approved for application in piping systems as listed in the table below with reference to DNV-RU-SHIP Pt.4 Ch.6 Sec.2 – 1.7 Plastic pipes "Table 2 - Fire endurance requirements matrix".

Approved installation locations where "0" is specified in "Table 2 - Fire Endurance requirements matrix".
Appropriate footnotes are to be observed.

Reference to Table 1	Item	Piping system
Sea water¹		
Bilge	12	Bilge main and branches ²
Essential system	16	Ballast water systems
Non-essential systems	19	Piping systems of Ballast Water Management Systems (BWMS).
Freshwater		
Non-essential systems	22	Potable hot and cold water and bunker lines Potable water treatment systems (Osmosis and Evaporation) Chilled water and cooling water of air condition systems
Sanitary and drains and scuppers		
Sanitary drains (internal)	24	Black and grey water including wastewater treatment and discharge lines to shore
Miscellaneous		
	30	Brine

Notes:

1: For installation location where "L3 and higher levels" is required, metallic isolation valves are to be fitted at the boundary to the ballast piping system of the ship. The isolation valves shall be remotely controlled valves from outside the space, e.g. fire control station and the valve shall be a fail-safe-closing type valve.

2: Limited for installation at following locations: "I" Cofferdams, void spaces, pipe tunnel and ducts according to DNV Rules Pt.4 Ch.6 Sec.2, "Table 2 - Fire Endurance requirements matrix".
Installation in "G" Fuel oil tanks and "H" Ballast water tanks is subject to case-by-case approval.

Extent of Type Tests applicable to piping system dependent on application

Fire endurance level

The piping system as specified in this certificate is not tested with respect to Fire Endurance characteristics.

Flame spread

Surface flame spread characteristics is confirmed by ASTM D635-14, Classification HB.

Smoke and toxicity

The piping system is not tested with respect to generating of smoke and toxic products in fire as defined in IMO FTP Code, Annex 2 - 2.2.

Electrical conductivity

The piping system is approved as:

- conductive, for installations in gas hazardous areas.

Conductivity test is to be carried out after installation of piping system on board ship.

Installation

For designing and installation of the piping system the instructions specified in the installation manual JSXH-JAN-01 rev 0 are to be observed.

In addition, the installation requirements specific to the ship as specified by the shipyard as well as DNV-RU-SHIP Pt.4 Ch.6 Sec.10 are to be observed.

After installation, the conductivity of the piping system shall be measured.

Plastic piping systems for essential service as described in DNV-RU-SHIP Pt.4 Ch.6 Sec.2 [1.7.5] are to be pressure tested after installation on board to $1.5 \times$ maximum working pressure. Minimum 4 bar for a minimum duration of 1 hour. For non-essential service pressure test with service pressure is sufficient.

Bulkhead penetration

General

When plastic pipes pass through watertight bulkheads or decks, the watertight integrity of the bulkhead or deck is to be maintained by installation of external pressure resistant pipe types specified in tables on page 2.

External pressure resistance level required by water head or/and vacuum in the pipe is to be observed.

In general 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.

Plastic pipes passing 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.

Refer to DNV-RU-SHIP Pt.4 Ch.6 Sec.2 – [1.7.6 Non-essential piping systems].

The operation of this valve shall be provided from above the freeboard deck.

Refer to DNV-RU-SHIP Pt.4 Ch.6 Sec.3 – [1.4 Fittings on watertight bulkheads].

Special case

Passenger vessels – SOLAS Ch. II-1 – Reg. 13.2.3:

On passenger vessels, where the watertight bulkhead is also a fire division, pipe penetration design shall comply to MSC.429(98), Reg. 13.2.3 is to be observed.

Type Approval documentation

Tests carried out

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

Marking of product

The marking is to be carried out in such a way that it is visible, legible, and indelible. The marking of the products is to enable traceability to this Type Approval Certificate.

Product	Scope	Example
Pipes	Brand	Jiangsu Xinghe Group Co., Ltd.
	Material grade	Marine polyethylene pipe PE
	Standard	IMO A.753(18)
	Dimension, OD	dn400*23.7
	Pressure rating, PN	PN10
	Production date	2019/6/18
	Temperature range	-20°C ~ 40°C
	Conductivity	conductive

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 / 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.dnv.com>

END OF CERTIFICATE