



Certificate No:
TAK000029A

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Plastic Piping System, Thermoplastic

with type designation(s)
PE-RT Pipes and Fittings

Issued to

Jiangsu Xilin Plastic Cement Co., Ltd.
Yangzhong, Jiangsu, China

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.6 Piping systems

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

Application :

For use in non-essential systems.

External pressure rating: 3.3 bar.

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

Issued at **Hamburg** on **2023-09-26**

This Certificate is valid until **2028-09-25**.

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

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.



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Product description

PE-RT Pipes and Fittings: The PE-RT plastic piping system consists of pipes and fittings made from high-density polyethylene of raised temperature resistance (PE-RT).

Pressure classes: PN10, PN16.

Nominal internal pressure PN: 10 bar, 16 bar.
(Short-term internal pressure with SF=4)

External pressure rating: 3.3 bar
(Collapse pressure with SF=3)

Pipes:

Nominal outside diameter dn	Nominal pressure PN ¹ [bar]	
	PN 10	PN 16
	nominal wall thickness e [mm]	
20	3.0	3.0
25	3.0	3.5
32	3.0	4.5
40	3.7	5.6
50	4.6	6.9
63	5.8	8.7
75	6.9	10.4
90	8.2	12.5
110	10.0	15.2
125	11.4	17.2
140	12.8	19.3
160	14.6	21.9

Notes:

1: PN class based on internal pressure – short-term tests for pipe with SF=4

Fittings:

90° elbow, 90° tee, flange.

Size range and pressure classes same as specified for pipes.

Joining techniques:

Socket-welding

Service parameter

Nominal external pressure rating	3.3 bar
Service temperature range	-20°C up to 95°C

Permissible working pressure and temperature limits¹

Nominal pressure PN [bar]	Maximum allowable working pressure [bar] for non-essential systems				
	-20°C up to 0°C	30°C	40°C	50°C	60°C
10	7.5	6.0	--		
16	12	9.5	6.0		

Notes

¹ Refer to DNV-CP-0072, Table 2

Maximum allowable pressure to be reduced as a function of operating temperature when service temperature is above 20°C.

Production place

Jiangsu Xilin Plastic Cement Co. Ltd., Yongxing Industrial Zone, Baqiao Town, Yangzhong City, Jiangsu Province, P.R. China.

Responsibility

The Company takes the responsibility that both design and production are following rules, standards and/or regulations listed on page 1 of this certificate.

Application/Limitation

The PE-RT plastic piping installation system is type approved for application in piping systems as listed in the table below.

Reference DNV Rules Pt.4, Ch.6, Sec.2 – 1.7 Plastic pipes “Table 1- Fire endurance requirements matrix”.

Approved installation locations where “0” is specified, appropriate footnotes are to be observed.

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

Reference to Table 1 ¹	Item	Piping system ¹
Freshwater (non-essential)	22	- Potable hot and cold-water piping systems and bunker lines. - Chilled water and cooling water piping of air condition systems. - Potable water treatment systems (Osmosis and Evaporation)
Sanitary and drains and scuppers (internal)	24	- Deck drains, - Sanitary drains such as black and grey water. - Wastewater discharge lines to shore
Miscellaneous	30	- Brine

Notes:

1) Reference to DNV Rules Pt.4, Ch.6, Sec.2 – 1.7 Plastic pipes “Table 1- Fire endurance requirements matrix”.

Bulkhead and deck 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.

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 Rules Pt.4, Ch.6, Sec.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.

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.

Extent of Type Tests applicable to piping system dependent on application

Fire endurance level

The PE-RT piping system is not tested with respect to fire endurance characteristics.

Flame spread

Surface flame spread characteristics is confirmed by ASTM D635:22, classification HB.

Smoke and toxicity

The piping systems is not tested with respect to smoke and toxicity characteristics.

Electrical conductivity

The piping system is non-conductive, not for installation in gas hazardous area, or used with non-conductive fluids.

Installation

For designing and installation of the piping system the instructions specified in the “Installation Services” document are to be observed.

In addition, the installation requirements specific to the ship as specified by the shipyard as well as DNV Rules Pt.4, Ch.6, Sec.10 – 4 Joining of plastic pipes are to be observed.

Type Approval documentation

Tests carried out

Type Testing carried out according to **Type Approval documentation**.

Production Testing

Each batch of pipes and fittings shall be subjected to product tests as specified in DNV-CP-0072 - Table 1 "Requirements for manufacturers quality control".

Appropriate works certificate to be issued for each batch.

Marking of product

The product is marked as follows:

Scope	Example
Manufacturer name and or trademark	Jiangsu Xilin Plastic Cement Co., Ltd., China
Nominal outside diameter and nominal wall thickness	dn20X3.0
Grade of material	PE-RT
Maximum internal service pressure	PN16
Production date and serial number	P20170908003
Standard no.	ISO 22391-2:2009
Temperature range	-40~95°C
Phone number	0511-88125886

The marking is to be carried out in such a way that it is visible, legible and indelible. The product name shall be the same as stated on the DNV Type Approval Certificate.

Periodical assessment

A condition for retention of the TA certificate in its validity period is that periodical assessments are successfully carried out.

For retention of the Type Approval, a surveyor to this Society shall perform periodical assessment after 2 years and after 3.5 years to verify that the conditions for the Type Approval are complied with. Refer to DNV-CP-0338, Sec.4.

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