DNV·GL

Certificate No:
TAK00001VC

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Plastic Pipes, Thermoplastic

with type designation(s)
PE 100

Issued to
Zhenjiang Jing Yu pipeline equipment Co. Ltd.
Yangzhong, China

is found to comply with
DNV GL class programme DNVGL-CP-0072 – Type approval – Thermoplastic piping systems
DNV GL rules for classification – Ships Pt.4 Ch.6 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 **2020-03-05**
This Certificate is valid until **2025-03-04**.
DNV GL local station: **Nanjing CMC**

Approval Engineer: **Joachim Rehbein**

for **DNV GL**

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.

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Product description

Pipes and fitings made of high density polyethylene (PE100).

Pressure classes PN10 (SDR17) and PN16 (SDR11).

Pipes:

Nominal outer diameter	Wall thickness	
DN	PN 10 (SDR17)	PN 16 (SDR11)
20	-	3.0
25	-	3.0
32	-	3.0
40	-	3.7
50	-	4.6
63	-	5.8
75	4.5	6.8
90	5.4	8.2
110	6.6	10.0
125	7.4	11.4
140	8.3	12.7
160	9.5	14.6
180	10.7	16.4
200	11.9	18.2
225	13.4	20.5
250	14.8	22.7
280	16.6	25.4
315	18.7	28.6
355	21.1	32.2
400	23.7	36.3
450	26.7	40.9
500	29.7	45.4
560	33.2	50.8
630	37.4	57.2
710	42.1	-
800	47.4	-
900	53.3	-

Fittings:

Fitting types	Joining techniques	diameter range [mm]
Tee 90° (equal and reduced), Equal straight, Reducer	hot melt socket weld	20 - 900
Tee, Elbow 90°, 45°, 22,5°	hot melt butt weld	20 - 900
Equal straight	flange fitting	20 - 900

Service parameter

Nominal external pressure rating	3.3 bar
Service temperature range	-20°C up to 40°C

Permissible working pressure

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

Responsibility

The Zhenjiang Jingyu pipeline equipment Co. Ltd. takes the responsibility that both design and production are in compliance with Rules, Standards and/or Regulations listed on page 1 of this certificate.

Assessed production place

Zhenjiang JingYu pipeline equipment co., LTD
Xinxing Industrial Park, Yangzhong Economic Development Zone, Jiangsu, 212215, China

Application/Limitation

The PE100 piping system is type approved for application in piping systems as listed in the table below. Reference DNVGL Rules Pt.4, Ch.6, Section 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 not approved for installation in gas hazardous area.

Item	Piping system[1]	
Seawater		
19	Non-essential systems	Ballast water management systems (BWMS)[2]
Freshwater		
22	Non-essential systems	Potable hot and cold water and bunkerlines Potable water treatment systems (Osmosis and Evaporation) Chilled water and cooling water of air condition systems
Sanitary and drains and scuppers		
24	Sanitary drains (internal)	Black and grey water including waste water treatment and discharge lines to shore

Notes
[1] Approved installation locations where "0" is specified in "Table 1 - Fire endurance requirements matrix". Appropriate footnotes are to be observed.
[2] 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.

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 ADTM D635, Classification HB.

Smoke and toxicity
The piping system is not tested with respect to capability of producing excessive quantities of smoke and toxic products as defined in IMO FTP Code, Annex 1: Part 2.

Electrical conductivity
Not applicable.

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.

Installation

For design and installation of the piping system the instructions "Polyethylene (PE100) Pipe & Fitting of Ships, 2019.12" are to be observed.

In addition the installation requirements specific to the ship as specified by the shipyard as well as DNVGL Rules Pt.4, Ch6, Section 9, 1.7 'Plastic pipes' and Section 10, 4 'Joining of plastic pipes' 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.

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.

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 product is to enable traceability to this Type Approval Certificate.

Product	Scope	Example
Pipes and fittings	Brand	
	Material grade	PE 100
	Standard	ISO 4427
	Dimension OD	d250
	Pressure rating PN	PN10
	Production date	Production batch number
	Type of fitting	Knee
	Colour	Black
	Traceability code	Bar code
	Country of origin	China

Periodical assessment

For retention of the type approval certificate periodical assessments shall be carried out at production places by DNVGL surveyor.
The objective of the periodical assessment is to verify that the design and production conditions for the type approval have not been altered.

Main scope of the assessment:
- verification of the production and quality control system
- review of quality control documentation of recent deliveries
- review of drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

End of certificate