DNV·GL

Certificate No:
TAK00001S8

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Plastic Pipes, Thermoplastic

with type designation(s)
PE100 Pipes and Fittings; PN6, PN8, PN10, PN12.5 and PN16

Issued to
Jiangsu Xinghe Group Co.,Ltd
ZHENJIANG, JIANGSU, China

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV GL class programme DNVGL-CP-0072 – Type approval – Thermoplastic 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 **2019-08-20**
This Certificate is valid until **2023-12-31**.
DNV GL local station: **Nanjing**

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.

Product description

PE100, Polyethylene Pipes and Fittings.

Nominal internal pressure classes; PN6, PN8, PN10, PN12.5 and PN16

Nominal diameter, DN [mm]	Wall thickness, min. [mm]				
	Standard Size Ratio, SDR				
	SDR26	SDR21	SDR17	SDR13.6	SDR11
	Nominal Pressure, PN [bar]				
	PN6	**PN8**	**PN10**	**PN12.5**	**PN16**
32	--	--	--	--	3.0
40	--	--	--	--	3.7
50	--	--	--	--	4.6
63	--	--	--	4.7	5.8
75	--	--	4.5	5.6	6.8
90	--	4.3	5.4	6.7	8.2
110	4.2	5.3	6.6	8.1	10.0
125	4.8	6.0	7.4	9.2	11.4
140	5.4	6.7	8.3	10.3	12.7
160	6.2	7.7	9.5	11.8	14.6
180	6.9	8.6	10.7	13.3	16.4
200	7.7	9.6	11.9	14.7	18.2
225	8.6	10.8	13.4	16.6	20.5
250	9.6	11.9	14.8	18.4	22.7
280	10.7	13.4	16.6	20.6	25.4
315	12.1	15.0	18.7	23.2	28.6
355	13.6	16.9	21.1	26.1	32.2
400	15.3	19.1	23.7	29.4	36.3
450	17.2	21.5	26.7	33.1	40.9
500	19.1	23.9	29.7	36.8	45.4
560	21.4	26.7	33.2	41.2	50.8
630	24.1	30.0	37.4	46.3	57.2
710	27.2	33.9	42.1	52.2	--
800	30.6	38.1	47.4	58.8	--

Fittings

Elbows, tees, flanges

Joining techniques

Butt and socket fusion

Service parameter

Nominal internal pressure class	PN6	PN8	PN10	PN12.5	PN16
Nominal external pressure rating [bar]	0.6	0.6	3.0	-	-

Permissible service pressure at lower and elevated temperatures

Temperature	PN	-20°C up to 0°C	30°C	40°C
Maximum allowable working pressure (bar)	10	7.5	6.0	-
	16	12.0	9.0	6.0

Application/Limitation

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

The PE100 piping system is type approved for application in piping systems as listed in "Table 1- Fire endurance requirements matrix" of DNVGL Rules Pt.4, Ch.6, Section 2. as follows:

Approved installation locations where "0" is specified in "Table 1 - Fire Endurance Requirements Matrix". Appropriate footnotes are to be observed.

Reference to Table 1	Item	Piping system
Sea water		
Bilge	12	Bilge main and branches [1]
Essential system	16	Ballast water systems
Non-essential systems	19	Piping systems of Ballast Water Management Systems (BWMS).[2]
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 waste water treatment and discharge lines to shore
Miscellaneous		
	30	Brine

Notes:

[1] Limited for installation at following locations: "I" Cofferdams, void spaces, pipe tunnel and ducts according to DNV GL Rules Pt.4, Ch.6, Section 2, "Table 1 - Fire Endurance Requirements Matrix". Installation in "G" Fuel oil tanks and "H" Ballast water tanks is subject to case by case approval.

[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 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
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 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 ship yard as well as DNVGL Rules Pt.4, Ch6, Section 9 and 10 are to be observed.

The piping system is not approved for installation in gas hazardous area.

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	Brand	Jiangsu Xinghe Group Co., Ltd
	Material grade	Marine polyethylene pipe PE 100
	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	non-conductive

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