

**TYPE APPROVAL CERTIFICATE****This is to certify:****That the Plastic Pipes, Thermoplastic**

with type designation(s)

**PPR Pipes and Fittings; PN10, PN12.5, PN16 and PN20**

Issued to

**Zhejiang Weixing New Building Materials Co.,Ltd  
Linhai, Zhejiang, China**

is found to comply with

**DNV GL class programme DNVGL-CP-0072 – Type approval – Thermoplastic piping systems  
DNV GL rules for classification – Ships****Application :****Essential and non-essential piping systems for water and sea water up to 20 bar. Service temperature 0°C to 95°C. For installation in accordance to DNV GL Rules and Manufacturer's recommendations. The piping system is not tested w.r.t. Fire Endurance. The piping system is tested to Low Flame Spread characteristics, as per ASTM D635.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2020-03-26**for **DNV GL**This Certificate is valid until **2025-03-25**.DNV GL local station: **Ningbo**Approval Engineer: **Gisle Hersvik****Gustav Heiberg  
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

### PPR Pipes and Fittings; PN10, PN12.5, PN16 and PN20

- Polypropylene Random Copolymer (PPR). Green color.
- Nominal Internal Pressure rating (PN): 10, 12.5, 16 and 20 bar.
- Nominal External pressure rating (EP): 1 bar.

Pipes, PN10 – PN 20:

Nominal diameter, DN [mm]	Wall thickness, nominal [mm]			
	Pipe Series, S			
	S5	S4	S3.2	S2.5
	Nominal Pressure, PN [bar]			
	10	12.5	16	20
20	2.0	2.3	2.8	3.4
25	2.3	2.8	3.5	4.2
32	2.9	3.6	4.4	5.4
40	3.7	4.5	5.5	6.7
50	4.6	5.6	6.9	8.3
63	5.8	7.1	8.6	10.5
75	6.8	8.4	10.3	12.5
90	8.2	10.1	12.3	15.0
110	10.0	12.3	15.1	18.3
125	11.4	14.0	17.1	20.8
140	12.7	15.7	19.2	23.3
160	14.6	17.9	21.9	26.6

#### Fittings:

Elbows, tees, sockets, end caps and male thread connectors.

#### Joining techniques:

Butt fusion, socket fusion, electrofusion and flanged.

## Application/Limitation

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

Item	Piping system <sup>1)</sup>	
<b>Seawater</b>		
19	Non-essential systems	- Ballast and bilge water management systems <sup>2)</sup>
<b>Freshwater</b>		
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
<b>Sanitary drains and scuppers</b>		
24	Sanitary drains (internal)	- Black and grey water including waste water treatment and discharge lines to shore
<b>Miscellaneous</b>		
29	Service air (non-essential)	
30	Brine	

#### Notes

- <sup>1)</sup> Approved installation locations where "0" is specified in "Table 1 - Fire endurance requirements matrix".  
 Appropriate footnotes are to be observed.

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- 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.

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

Maximum service pressure: 20 bar.  
Service temperature range: 0°C to 95°C.

#### **Fire Endurance**

The piping system is not tested with respect to Fire Endurance characteristics.

#### **Low Flame Spread**

The piping system is tested to Low Flame Spread characteristics, as per ASTM D635-18 (Classification HB).

#### **Smoke Generation & 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**

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

#### **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.

#### **Bulkhead and Deck Penetration**

Pipe penetration through watertight bulkheads or decks as well as through fire divisions shall be type approved unless the 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 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.

#### **Type Approval documentation**

1. Assessment Report from DNV GL Ningbo of 2020-01-27.
2. Data Sheet for Hostalen PP H5416T from HMC Polymers, incl. Regression curves.
3. "DNV GL Witness of Tests".
4. "Marine plastic pipe and fittings approval test program".
5. Application Material, including Guide of Installation.
6. SGS Test Report No. SHIN190601836CCM of 2019-10-16, incl. testing to ASTM D635-18.
7. SGS Test Report No. AJFS1906005863RS of 2019-07-12, incl. testing to BOMBARDIER, SMP 800-C.
8. CTI Test Report No. A2190125201101001 of 2019-06-04.
9. Material Declaration – Asbestos of 2019-12-12.
10. Application for Type Approval of 2019-12-12.

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## Tests carried out

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

## Marking of product

The product is to be marked with the *manufacturer's name*: **Zhejiang Weixing New Building Materials Co., Ltd., China**, *pressure rating*, *temperature rating* and *type designation*.

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

## 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 and Certificate Renewal) shall be performed according to DNVGL-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.dnvgl.com>

END OF CERTIFICATE