

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Plastic Piping System, Thermoplastic

with type designation(s)

**NIRON CLIMA PP-RCT PIPE WITH FIBER GLASS and NIRON CLIMA BETA PP-RCT PIPE WITH FIBER GLASS,
NIRON B PP-RCT FITTINGS**

Issued to

NUPI INDUSTRIE ITALIANE SPA

Milano, MI, Italy

is found to comply with

**DNV class programme DNV-CP-0072 – Type approval – Thermoplastic piping systems
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**

Application :

For use in non-essential and essential piping systems and in piping systems serving the main functions. For water and seawater up to 8 (10), 12.5 (16), 16 (20) and 20 (25) bar. Service temperature range 0°C to 70°C (95°C for shorter periods). For installation in accordance with DNV Rules and Manufacturer's Specification. The piping system is tested to Low Flame Spread characteristics according to ASTM D635. The piping system is not tested w.r.t. Fire Endurance characteristics.

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

Issued at **Høvik** on **2022-01-19**

This Certificate is valid until **2027-01-18**.

DNV local station: **Italy/Malta CMC**

for **DNV**

Approval Engineer: **Stefan Marion**

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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.

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.



Product description

NIRON CLIMA PP-RCT PIPE WITH FIBER GLASS and NIRON CLIMA BETA PP-RCT PIPE WITH FIBER GLASS (SDR 7.3/7.4, SDR9, SDR11 and SDR17) and NIRON β PP-RCT Fittings

- Refer to Nupi's Catalogue; Multilayer NIRON PP-RCT pipes
- Polypropylene Random-Copolymer (PP-RCT) with Fiberglass
- In conformity with standards UNI EN ISO 15874, DIN 8077, CSA B137.11, ASTM F2389
- Nominal Internal Pressure rating (NUPI): 10 / 16 / 20 / 25 bar at 20°C
- Nominal Internal Pressure rating (IMO*): 8 / 12.5 / 16 / 20 bar.
* IMO=IMO Resolution A.753(18); Downrated due to internal burst pressure testing.
- External Pressure rating: 2.7 bar (collapse resistant, for minimum pressure class SDR17), > 3 bar (collapse resistant, for other SDR)

Pipes:

Nominal diameter, DN [mm]	Nominal Wall thickness [mm]			
	Standard Size Ratio, SDR			
	SDR 7.3/7.4	SDR 9	SDR 11	SDR 17
	Nominal Pressure, PN [bar]			
	25 (20)	20 (16)	16 (12.5)	10 (8)
20	2.8	-	-	-
25	3.5	-	2.3	-
32	4.4	3.6	2.9	-
40	5.5	4.5	3.7	-
50	6.9	5.6	4.6	-
63	8.6	7.1	5.8	3.8
75	10.3	8.4	6.8	4.5
90	12.3	10.1	8.2	5.4
110	15.1	12.3	10.0	6.6
125	17.1	14.0	11.4	7.4
160	21.9	17.9	14.6	9.5
200	27.4	22.4	18.2	11.9
250	34.2	27.9	22.7	14.8

NIRON β Fittings (PP-RCT):

Elbows, tees, reducers, couplers, end caps, stub ends, transitions (swivel/threaded).

Joining techniques:

Socket fusion, electrofusion and butt fusion.

Manufactured by

Castel Guelfo Plant; Via Dell'Artigianato 13, 40023, Castel Guelfo (BO), Italy [Pipes]

Busto Arsizio Plant; Via Stefano Ferrario 8, Z.I. Sud-Ovest – 21052 Busto Arsizio (VA), Italy [Fittings]

DNV local station: Milan

Responsibility

The Company (stated on the front page of this Certificate) takes the responsibility that both design and production are in compliance with Rules, Standards and/or Regulations listed on page 1 of this certificate.

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 Rules Pt.4, Ch.6, Section 2, as follows:

Item ¹⁾	Example of piping systems
Freshwater	

Non-essential systems	22	Potable hot and cold water and burkerlines. Grey and Black water, hot water heating, potable water treatment systems (Osmosis and Evaporation) Chilled water and cooling water of air condition system
Sanitary drains and scuppers		
Sanitary drains internal	24	Black and grey water including wastewater treatment and discharge lines to shore
Scuppers and discharges (overboard)	25	
Sounding and air		
Water tanks or dry spaces	26	Sounding and air pipes of water tanks and dry spaces, cofferdams
Sea water		
Non-essential systems	19	Piping systems of Ballast Water Management Systems (BWMS)
Essential systems	12, 13, 14, 15, 16, 17, 18	Bilge main and branches, fire main and water spray, foam systems, Sprinkler system, Ballast water systems, cooling water, Tank cleaning services fixed machines.
Miscellaneous		
Service-air (non essential)	29	
Brine	30	
Central vacuum cleaners	32	

Notes:

¹⁾ Approved installation locations where "0" is specified in Table 1 – Fire endurance requirements matrix.

Maximum service pressure; 8 (10), 12.5 (16), 16 (20) and 20 (25) bar. Ref. above table w.r.t. dimensions.
Maximum allowable pressure to be reduced as a function of operating temperature when service temperature is above 20°C. Please refer to DNV-CP-0072, Table 2.

Service temperature range; 0°C to 70°C. For shorter periods up to 95°C.

Fire Endurance Level

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

Low Flame Spread

The piping system is tested for low flame spread characteristics in accordance with ASTM D635:18.

Smoke Generation & Toxicity

The piping system is not tested with respect to Smoke Generation & Toxicity characteristics.

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.

INSTALLATION

For installation in accordance with DNV Rules and Manufacturer's Specification: for designing and installation of NIRON piping systems the instructions in "NIRON Technical Manual" are to be observed.

For sea water and brine applications only use transitions fittings made of sea water resistant stainless steel.

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, 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

Type Approval documentation

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, dimensions, SDR rating, batch no. and material 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 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 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