

TYPE APPROVAL CERTIFICATE

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

with type designation(s)

SDP TERRAIN PB; PN10 Polybutylene Pipes and Fittings

Issued to

NUEVA TERRAIN, S.L.**Vitoria-Gazteiz, Spain**

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 systems for hot and cold fresh and sea water up to 10 bar. Service temperature range 0°C to 70°C. For installation in accordance with DNV GL Rules and Manufacturer's Specification. The piping system is tested to Low Flame Spread in accordance with ASTM D635. The piping system is not tested with respect to Fire Endurance characteristics.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2018-06-26**for **DNV GL**This Certificate is valid until **2023-06-25**.DNV GL local station: **Bilbao**Approval Engineer: **Gisle Hersvik****Rikard Törnqvist
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

SDP TERRAIN PB; PN10 Polybutylene (PB) Pipes and Fittings.

- Internal pressure: max. 10 bar
- External Pressure: None.
- Operating temperature: 0°C to 70°C, short periods up to 95°C.

Dimensions:

OD15 to OD110 as per NUEVA TERRAIN S.L.'s Product Specification.

	Outside diameters (OD) and minimum wall thickness (t)													
OD [mm]	15	16	16	20	22	25	28	32	40	50	63	75	90	110
t [mm]	1,7	1,8	2,2	2,3	2,0	2,3	2,5	2,9	3,7	4,6	5,8	6,8	8,2	10,0
S	4	4	3,15	4	5	5	5	5	5	5	5	5	5	5

Fittings:

PB pipes to be joined with approved/tested PB fittings.

Joining techniques:

Joining technique	Diameters [mm]	PN [bars]
Push-fit	15-16-20-22-25-28-32-40-50	10
Socket fusion	16-20-25-32-40-50-63	10
Electro fusion	63-75-90-110	10
Butt fusion	63-75-90-110	10

Legends:

PB: Polybutylene
OD: Outside Diameter
S: Pipe series
PN: Nominal Pressure rating

Application/Limitation

For installation in accordance with DNV GL Rules for Classification and Manufacturer's Specification.

The approval covers application such as essential and non-essential systems, hot and cold water systems chilled and brine water systems, cooling systems (air condition), black and grey water systems, water treatment, fresh and waste water, osmosis systems and evaporation, fresh water bunker lines, etc.

The piping system is not approved:

- for installation within tanks and vacuum applications,
- for installation open decks, and
- for installation in gas hazardous area (as piping system is non-conductive).

Fire Endurance:

The piping system is not tested with respect to Fire Endurance characteristics, i.e. the piping system shall be installed where there are no specified requirements to Fire Endurance, ref. the Fire Endurance matrix of the IMO Resolution A.753(18), as amended, and DNV GL Rules for Classification: Ships, Pt.4 Ch.6 Sec.2.

Low Flame Spread:

The piping system is approved to Low Flame Spread in accordance with ASTM D635 (accepted as an alternative to IMO FTP Code, Annex 1, Part 5).

Smoke Generation & Toxicity:

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

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.

Bulkhead and deck penetration:

Pipe penetrations 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.

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. Previous Type Approval Certificate No. K-6152.
2. Assessment Report from DNV GL Bilbao of 2018-06-19.
3. Internal pressure test records.
4. Letter from Nueva Terrain of 2018-06-08.
5. Application for Type Approval of 2018-06-26.
6. Assessment Report from DNV GL Bilbao of 2014-10-24.
7. Letter from Nueva Terrain of 2014-10-14.
8. Application for Type Approval of 2014-10-13.
9. EXOVA Test Report (ASTM D635-10) "Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position" (Document Reference: 323922) of 2012-12-17.
10. Email from Nueva Terrain S.L. of 2010-03-04, incl. External Pressure Capacity calculations.
11. Initial Survey Report from DNV Bilbao of 2010-02-02.
12. Internal Pressure - Short Term Tests, ref. DNV Bilbao Survey Report of 2010-02-02.
13. Email from Nueva Terrain S.L. of 2010-01-21, incl. Test Schedule.
14. Email from Nueva Terrain S.L. of 2009-11-30, incl. Test Programme and Test Reports.
15. Application for Type Approval of 2009-10-30.
16. Product information, Product Specification "TERRAIN SDP, PB Pipes, Parts and Components. Electro fusion, Thermofusion and Butt Welding system", incl. Installation Guide.
17. BODYCOTE POLYMER AB Report No. BODYCOTE/P-03/126 of 2003-06-23 (Hydrostatic Pressure Test).
18. KIWA Report No. 2099 "Plastic piping system for the transport of cold and hot drinking water".
19. CEIS Report No. LMP-0374/2008 of 2008-06-17.
20. Various correspondences between DNV and Nueva Terrain S.L. in the period Aug 2009 – Mar 2010.

Tests carried out

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

Marking of product

The pipes and fittings are to be marked. The marking shall at least include the following information:

- *Manufacturer's name*; **NUEVA TERRAIN S.L.** and/or
- *Trade mark / type designation*; **Terrain SDP** (pipes) or **SDP** (fittings)
- *Dimensions*

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- *Pressure rating*
- *Temperature rating*

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 Assessment to be performed after 2 and 3.5 years (Certificate Retention) and at renewal after 5 years (Certificate Renewal).

The main elements of the Periodical Assessment are to:

- Ensure that **Type Approval documentation** is available.
- Review design, materials, production process, and performance with respect to possible changes, in order to ensure compliance with **Type Approval documentation** and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and the DNV GL Type Approval Certificate.

END OF CERTIFICATE