

Tubi multistrato metallo-plastici e relativi raccordi plastici (PPSU) per impianti sanitari, di riscaldamento e condizionamento nel settore navale (Prescrizioni DNV-GL, IMO Resolution A.753 (18)).

Metal-plastic multi-layer pipes and relative plastic fittings (PPSU) for domestic, heating and air-conditioning systems in the shipping sector (DNV-GL prescription, IMO Resolution A.753 (18)).

SETTORE NAVALE - NAVAL INDUSTRY



TYPE APPROVAL CERTIFICATE

Certificate No:
TAK00000XV
Revision No:
3

This is to certify:

That the Plastic Piping System, Thermoplastic

with type designation(s)

Pexal® Piping System and Fittings

Issued to

Valsir S.p.A.
Vestone, BS, Italy

is found to comply with

DNV class programme DNV-CP-0072 – Type approval – Thermoplastic piping systems
DNV rules for classification – Ships
DNV offshore standards
IMO Resolution A.753(18). Guidelines for the Application of Plastic Pipes on Ships

Application :

For use in non-essential and essential systems up to 12/13/16 bar. Service temperature -60°C to 95°C. For installation in accordance to DNV Rules and Manufacturer's recommendations. The piping system is not tested w.r.t. Fire Endurance. The piping system is tested w.r.t. Low Flame Spread characteristics.

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

Issued at **Høvik** on **2022-09-06**

This Certificate is valid until **2027-08-07**.

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

Approval Engineer: **Stefan Marion**



for DNV

Digitally Signed By: Gustav Heiberg
Location: Høvik, Norway
Signing Date: 06.09.2022
Contact Info: +47 67579900

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.



Form code: TA 251

Revision: 2021-03

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Page 1 of 3

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Job Id: **262.1-026633-4**
 Certificate No: **TAK00000XV**
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Product description

Pexal® multilayer pipes connected with Pexal Easy®, Pexal® XL and Bravopress® fittings.

Pexal® multilayer pipes PE-Xb/Al/PE-Xb consist of crosslinked Polyethylene (PE-Xb) inside and outside with an intermediate layer of aluminium (Al) alloy with longitudinal butt welding as permanent oxygen and light barrier.

Fitting systems: Pexal Easy® (OD 16-75), Bravopress® (OD 16-63), Pexal® XL (OD 40-110)
 Fitting material: Polyphenylsulphone

Maximum operating temperature: 95°C

Nominal internal pressure rating: 16 bar (OD 16-32) / 13 bar (Pexal Easy® OD 40-75 and Bravopress® OD 40-63) / 12 bar (Pexal® XL OD 40-110)

Nominal external pressure rating: 3 bar (collapse resistant)

Pipe dimension, external diameter [mm]	16	16	18	20	20	26	32
Wall thickness [mm]	2	2.25	2	2	2.5	3	3

Pipe dimension, external diameter [mm]	40	50	63	75	90	110
Wall thickness [mm]	3.5	4	4.5	5	7	10

Manufactured by

Valsir S.p.A., Localita Merlaro, 2; 25078 Vestone (BS), Italy

DNV local station: Milan

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, Sec.2 where "0" is specified. Appropriate footnotes are to be observed.

For use up to max. 12/16 bar and 95°C. Also for heating applications. The temperature limit may be extended up to 100°C for shorter periods at 10 bar, otherwise the long-term working pressure shall be reduced as per Manufacturer's recommendations. The pipes can be exposed to an external pressure of 3 bar.

Maximum service pressure: 16 bar (OD 16-32)
 13 bar (Pexal Easy® OD 40-75, Bravopress® OD 40-63)
 12 bar (Pexal® XL OD 40-110)

External pressure rating: 3 bar
 Service temperature range: -60°C to 95°C (for shorter periods up to 100°C)

Fire Endurance

The piping system is not tested w.r.t. Fire Endurance characteristics

Low Flame Spread

The piping system is tested w.r.t. Low Flame Spread characteristics 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 w.r.t. Smoke Generation & Toxicity characteristics.

Electrical conductivity

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

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.

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INSTALLATION

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

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

1. Application for Modification of Type Approval Certificate TAK00000XV (addition of Pexal XL)
2. Periodical Type Approval Assessment Report as of 2022/06/13
3. ISO 9001 certificate
4. Example for Control Plan Production and Production Quality Plan I-PPR.19/5
5. Technical Data Sheets for Pexal, Pexaleasy and Bravopress (updated 2020) including Assembly Procedure
6. Technical Data Sheets/Product catalogue for Pexal XL (February 2022)
7. Test Report by Valsir, witnessed by DNV GL of 2017/08/11
8. Test Report by Valsir regarding burst test, report issued 2022-06-14, testing witnessed by DNV
9. Test Report by Valsir regarding external pressure test, report issued 2022-06-14, testing witnessed by DNV
10. Test Report B447/15 from IMA Dresden of 2015/02/05
11. Test Report B077/10 from IMA Dresden of 2011/06/01
12. Test Report 549/12 from IMA Dresden of 2014/03/21
13. Test Report 44381/01-V from SKZ-Tecona GmbH Würzburg of 2005/03/03
14. RINA Test Reports 2008CS015841/1 and 2008CS015841/2 of 2008/12/29
15. Technical Information regarding Polidan ® T/A PEX from Padanaplast

Tests carried out

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

Marking of product

The product is to be marked with:

- manufacturer's name; **Valsir S.p.A, Italy**
- manufacturing plant address
- type designation; **PEXAL**
- pressure rating
- nominal pressure
- dimensions
- production date/Batch no.

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 / 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