



CERTIFICATE NUMBER	20-HS1951264-PDA
EFFECTIVE DATE	28-Feb-2020
EXPIRY DATE	27-Feb-2025
ABS TECHNICAL OFFICE	Houston ESD - Piping

CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

PERMA-PIPE, INC.

located at

6410 WEST HOWARD STREET, NILES, IL, United States, 60714

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product Pipe System, Pre-insulated

Model XTRU-THERM®

This Product Design Assessment (PDA) Certificate remains valid until 27/Feb/2025 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping
Yongjin Lee, Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

PERMA-PIPE

6410 WEST HOWARD STREET

NILES IL

United States 60714

Telephone: 847-966-2235

Fax: 847-470-1204

Email: ron.pescatore@permapipe.com

Web: www.permapipe.com

Tier: 2 - PDA Issued

Product: Pipe System, Pre-insulated

Model: XTRU-THERM®

Intended Service:

Marine Applications – XTRU-THERM® -Insulated Piping System for Hot and Cold Fluids

Description:

High Density Polyethylene (HDPE) Jacketed, Polyurethane Insulated Piping System.

Complete line of factory insulated piping systems to effectively and efficiently transport low temperature cryogenic fluids like LNG as well as hot fluids up to 284°F (140°C).

Service pipe construction: 304 - 316 Stainless Steel (1/2" - 36").

Construction of insulation system: Spray applied, void free polyurethane or poly-isocyanurate foam insulation bonded to the steel pipe with extruded HDPE jacket bonded to the foam, yielding a "fully bonded system". FRP/metal jacketing are also available as options.

Rating:

Temperature ratings: XTRU-THERM® : -320°F(-200°C) to 284°F (140°C).

Service Restriction:

Unit Certification is not required for this product.

Comments:

1. The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
2. Pipe specification, pipe material and wall thickness specified by customer must be submitted for review for each installation. The piping can be supported with external supports on the pipe jacket due to the high compressive strength of the insulation and outer jacket.
3. Addition of a metal jacket over the HDPE jacket can be used to mitigate flammability issues.

Notes/Drawing/Documentation:

Drawing No. ABS Letter, Declaration of Conformity, Revision: -, Pages: 1

Drawing No. Permapipe P21802_PO_ACK, Purchase Order, Revision: -, Pages: 1

Drawing No. Cryogel_X201_Ds, Cryogel, Revision: -, Pages: -

Drawing No. Fuel-Gard Brochure, Fuel Brochure, Revision: -, Pages: 1

Drawing No. Letter And Doc, Letter And Doc, Revision: -, Pages: 1

Drawing No. Material Data Sheet, Density Pu Foam, Revision: -, Pages: -

Drawing No. Skmbt_C75414073013240, Documents, Revision: -, Pages: 1

Drawing No. Xtru-Therm Brochure-, Brochure XTRU-THERM, Revision: -, Pages: 1

Drawing No. Heat Transfer Calculations, Heat Transfer Calculations 10 30 14, Revision: -, Pages: -

Drawing No. Supporting Documentation: Brochures And Material Data Sheets For XTRU-THERM

Terms of Validity:

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STANDARDS**ABS Rules:**

Rules for Conditions of Classification (2020), Part 1, 1-1-4/7.7, 1-1-A3, 1-1-A4, which covers the following:
2020 Marine Vessels Rules 4-6-2, 5C-8-5, 5C-8-6, 5C-13-16, 5C-13-7

National:

ASME B31.1, Power Piping Edition 2018

International:

NA

Government:

Resolution MSC.370(93) adopted 22 May 2014 - IGC Code.

EUMED:

NA

OTHERS:

NA