



CERTIFICATE NUMBER
15-GE1444273-PDA

DATE
22 Dec 2015

ABS TECHNICAL OFFICE
Genoa Engineering Department

CERTIFICATE OF DESIGN ASSESSMENT

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

PENTA SRL

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: **Cryogenic Valve**

Model: **SAT CRIO FLOTT ANSI 150 RF**

This Product Design Assessment (PDA) Certificate 15-GE1444273-PDA, dated 22/Dec/2015 remains valid until 21/Dec/2020 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

AMERICAN BUREAU OF SHIPPING

Lucio Trevisan
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 the terms and conditions as contained in ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010).

PENTA SRL

VIA BOCCACCIO 23

MOLINETTO (BS)

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Email: info@pentavalves.it

Web: www.pentavalves.it

Tier: 5 - Unit Certification Required

Product: Cryogenic Valve

Model: SAT CRIO FLOTT ANSI 150 RF

Intended Service:

LNG Cryogenic service for Marine and Offshore applications.

Description:

Flanged type ball valves made of ASME SA 182 Gr. F316L stainless steel.

Sizes: 1", 2", 4" and 6".

Main valve components are: valve body, valve connector, cryogenic elongation and upper cover. These are connected together through flanged connections.

Other valve components and materials are:

- Stem: AISI 316 / Nitronic 50 (UNS S20910);

- Ball: AISI 316;

- Seat holder: AISI 316

- Seat: KEL-F (PCTFE)

- Seat spring: X750

- Bolts: ASTM A193 B8M

For additional details, please refer to General Arrangement Drawing L03900-DPL Rev.0.

Rating:

Design Pressure: 16 bar (ASME Class 150).

Design Temperature: -150°C to +40°C (ASME Class 150).

Service Restriction:

Unit Certification is required for this product when intended to be used at a working temperature below -55°C.

Comments:

1) As per 5C-8-5/3.2.1 (b) of ABS Steel Vessel Rules, for Unit Production Testing, all valves are to be tested at the plant of Manufacturer in the presence of the Surveyor.

Testing is to include hydrostatic test of the valve body at a pressure equal to 1.5 times the design pressure and seat and stem leakage test at a pressure equal to 1.1 times the design pressure in accordance with Manufacturer's testing procedure.

In addition, cryogenic testing consisting of valve operation and leakage verification for a minimum of 10% of each type and size of valves has to be performed.

2) Material testing is to be witnessed by an ABS Surveyor in accordance with applicable Recognized Standard and section 5C-8-6/1.3 (ABS) of the ABS Steel Vessel Rules.

3) All valves are to bear permanent identification, such as Manufacturer's name or trademark, standard of compliance, material identify, pressure rating, etc., as required by the standard of compliance or the Manufacturer's specification. Such markings may be cast or forged integral with, stamped on, or securely affixed by nameplate on the component, and are to serve as a permanent means of identification of the component throughout its service life. (See 4-6-1/7.1.4 of ABS Steel Vessel Rules).

4) The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

5) The present assessment is not carried out on behalf of any Flag Administration.

Notes/Drawing/Documentation:

Drawing No. L03900-DPL, BALL VALVE TYPE SAT CRYO FLOTT ANSI 150 RF - GENERAL ARRANGEMENT DRAWING, Revision: 0,

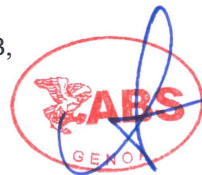
Drawing No. T73801, VALVE BODY DN 1", Revision: C,

Drawing No. T73802, VALVE CONNECTOR DN 1", Revision: B,

Drawing No. T73806, VALVE UPPER COVER DN 1", Revision: Z,

Drawing No. T73806-1, CRYOGENIC ELONGATION DN 1", Revision: B,

Drawing No. T77413, VALVE SEAT DN 1", Revision: 0,



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Drawing No. T63801, VALVE BODY DN 2", Revision: D,
Drawing No. T63802, VALVE CONNECTOR DN 2", Revision: C,
Drawing No. T73006, VALVE UPPER COVER DN 2", Revision: W,
Drawing No. T73013-1, VALVE SEAT DN 2", Revision: A,
Drawing No. T73046, CRYOGENIC ELONGATION DN 2", Revision: 0,

Drawing No. T107001, VALVE BODY DN 4", Revision: A,
Drawing No. T107002, VALVE CONNECTOR DN 4", Revision: A,
Drawing No. T107006, VALVE UPPER COVER DN 4", Revision: 0,
Drawing No. T107013, VALVE SEAT DN 4", Revision: 0,
Drawing No. T107046, CRYOGENIC ELONGATION DN 4", Revision: 0,

Drawing No. T66601, VALVE BODY DN 6", Revision: B,
Drawing No. T66602, VALVE CONNECTOR DN 6", Revision: B,
Drawing No. T66606-1, VALVE UPPER COVER DN 6", Revision: A,
Drawing No. T66646, CRYOGENIC ELONGATION DN 6", Revision: 0,
Drawing No. T96413, VALVE SEAT DN 6", Revision: A,

Type Test Reports No. 15/S011, 15/S012, 15/S013 and 15/S014 dated 18th November 2015 – Shell test, Seat test and Cryogenic test reports
Test Procedure No. IOCQ04, Rev. 01 for Type Test of SAT CRIO Ball Valves.

Terms of Validity:

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STANDARDS

ABS Rules:

- Rules for Condition of Classification (2015): 1-1-4/7.7, 1-1-A3 and A4
- Steel Vessels Rules (2015): 1-1-4/7.7, 1-1-A3 and A4, 4-6-1/7.1.4, 4-6-2/5.11, 5C-8-5/2.4.4, 5C-8-5/3.2.1 and 5C-8-6/1.3.
- Steel Vessels Rules Under 90 Meters (295 Feet) in Length (2015): 1-1-4/7.7, 1-1-A3 and A4.
- Offshore Support Vessels Rules (2015): 1-1-4/7.7, 1-1-A3 and A4.
- Rules for Conditions of Classifications – Offshore Units and Structures (2015) 1.1.4/9.7, 1-1-A2 and A3.
- Mobile Offshore Drilling Units Rules (2015): 1.1.4/9.7, 1-1-A2 and A3.

National:

NA



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Tier: 5 - Unit Certification Required

International:

- International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) – Ed. 1993 as amended.

Government:

NA

EUMED:

NA

OTHERS:

NA

