



CERTIFICATE NUMBER
18-HS1732017-PDA

DATE
19 Jun 2018

ABS TECHNICAL OFFICE
Houston ESD - Piping

CERTIFICATE OF Design Assessment

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

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: **2-Way Ball Valves: CP Series, CN Series, C6 Series and IB Series.**

This Product Design Assessment (PDA) Certificate 18-HS1732017-PDA, dated 19/Jun/2018 remains valid until 18/Jun/2023 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

Tim Kimble
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).

PBM

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Web: www.pbmvalve.com

Tier: 5 - Unit Certification Required

Product: Cryogenic Valve

Model: 2-Way Ball Valves: CP Series, CN Series, C6 Series and IB Series.

Intended Service:

Cryogenic LNG/LPG services in Marine and Offshore Applications.

Description:

2-Way Full Port Fire-safe Cryogenic Valves (CP, CN and C6 Series) - 1/2" to 4" ;

2-Way Cryogenic Instrument Valves (IB Series) - 3/4" and 1" ;

Materials:

Body: ASME A351, CF8M, ASME A479, S31603;

Bonnet: ASME A351, CF3M, ASME A479, S31603;

Stem: ASME A564 S17400, H1150D;

Ball: 316L SST, ASME A479, S31603;

Bolts: ASME A320, CL.I, GR.B8;

Consult with the manufacturer regarding other available materials for specific services per ASME B16.34 or MSS SP 72

Rating:

Design Temperature: -196°C to +205°C;

Design Pressure Ratings:

2-Way Full Port Fire-safe Cryogenic Valves:

ASME Class #150:

CP Type Series 6: 1/2", 3/4", 1", 1-1/2", 2", 3" and 4" ;

CN Type Series 6: 1/2", 3/4", 1", 1-1/2", 2", 3" and 4" ;

ASME Class #300:

CP Type Series 6: 1/2", 3/4", 1", 1-1/2", 2", 3" and 4" ;

CN Type Series 6: 1/2", 3/4", 1", 1-1/2", 2", 3" and 4" ;

ASME Class #600:

C6 Type Series 6: 1/2", 3/4", 1", 1-1/2" and 2" ;

CN Type Series 6: 1/2", 3/4", 1", 1-1/2", 2", 3" and 4" ;

2-Way Cryogenic Instrument Valves:

IBH Type Series 5 Class #2500: 1" ;

IBH Type Series 5 up to 5367 psig: 3/4" ;

Service Restriction:

1) Unit Certification is required for this product.

2) All valves are to be tested at the plant of manufacturer in the presence of the Surveyor in accordance with 5C-8-5/13.1.1 (b) of ABS Steel Vessels Rules.

3) The material for valves with design temperature at or below -55°C are to be tested in the presence of the Surveyor in accordance with 5C-8-6/2.2 of ABS Steel Vessels Rules.

Comments:

1) The manufacturer is to guarantee that the valve has been tested to the pressure required by the pressure rating of the valve prior to shipment.

2) All valves to bear the trademark of the manufacturer legibly stamped or cast on the exterior of the valves as well as the primary rating.

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

4) All valves are to be subjected by the manufacturer to a hydrostatic test at pressure equal to that stipulated by the American National Standards Institute or other recognized standard. The manufacturer's Trademark, pressure/temperature rating and material identification, as applicable, must be stamped or cast on the component.

5) Electrical components not included in this PDA

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Tier: 5 - Unit Certification Required

Notes/Drawing/Documentation:

Supporting Documents:

Sample Drawings:

CP Series:

Drawing No. CPH-H6J-G---04-L, 2" CPH-H6, 2-WAY, API-607, 300# Cryogenic Ball Valve, Rev. 0, Date: 07/07/16, Page: 1;

Drawing No. CPHLC6B-G---04-L, 1/2" CPHLC6, 2-WAY, API-607, 300# Cryogenic Ball Valve, Rev. 0, Date: 09/13/16, Page: 1;

Drawing No. CPHLC6Q9G---04-T296, 1/2" CPHLC6, 2-WAY, API-607, CL. 300, Double Block & Bleed Cryogenic Ball Valve, Rev. 0, Date: 10/02/17, Page: 1;

Drawing No. CPHLD6B-G---02-L, 3/4" CPHLD6, 2-WAY, 300# Cryogenic Ball Valve, Rev. 0, Date: 03/07/16, Page: 1;

Drawing No. CPHLE6B-G---04-L, 1" CPHLE6, 2-WAY, API-607, 300# Cryogenic Ball Valve, Rev. 0, Date: 09/13/16, Page: 1;

Drawing No. CPHLE6B9G---04-T293, 1" CPHLE6, 2-WAY, API-607, CL. 300, Cryogenic Ball Valve, Rev. 0, Date: 10/04/17, Page: 1;

Drawing No. CPHLE6B9G---66-T293, 1" CPHLE6, 2-WAY, API-607, CL. 300, Cryogenic Ball Valve, Rev. 0, Date: 10/05/17, Page: 1;

Drawing No. CPHLG6B-G---04-L, 1-1/2" CPHLG6, 2-WAY, API-607, 300# Cryogenic Ball Valve, Rev. 0, Date: 09/13/16, Page: 1;

Drawing No. CPHLH6B-G---04-L, 2" CPHLH6, 2-WAY, API-607, 300# Cryogenic Ball Valve, Rev. 0, Date: 09/14/16, Page: 1;

Drawing No. CPHLK6B-G---02-L, 3" CPHLK6, 2-WAY, API-607, 300# Cryogenic Ball Valve, Rev. 0, Date: 12/16/16, Page: 1;

Drawing No. CPHLL6B-G---02-L, 4" CPHLL6, 2-WAY, API-607, 300# Cryogenic Ball Valve, Rev. 0, Date: 12/16/16, Page: 1;

CN Series:

Drawing No. CNH-C6L9G---04-L, 1/2" CNH-C6, 2-WAY, API-607, 150# Cryogenic Ball Valve, Rev. 0, Date: 06/05/17, Page: 1;

Drawing No. CNH-C6N-G---02-L, 1/2" CNH-C6, 2-WAY, API-607, 600# Cryogenic Ball Valve, Rev. 0, Date: 08/17/16, Page: 1;

Drawing No. CNH-D6L-G---02-L, 3/4" CNH-D6, 2-WAY, 150# Cryogenic Ball Valve, Rev. 0, Date: 03/17/16, Page: 1;

Drawing No. CNH-D6M-G---04-L, 3/4" CNH-D6, 2-WAY, API-607, 300# Cryogenic Ball Valve, Rev. 0, Date: 03/23/15, Page: 1;

Drawing No. CNH-D6N-G---02-L, 3/4" CNHLD6, 2-WAY, API-607, 600# Cryogenic Ball Valve, Rev. 1, Date: 02/21/17, Page: 1;

Drawing No. CNH-E6L-G---02-L, 1" CNH-E6, 2-WAY, 150# Cryogenic Ball Valve, Rev. 0, Date: 03/31/17, Page: 1;

Drawing No. CNH-E6M-G---04-L, 1" CNH-E6, 2-WAY, API-607, 300# Cryogenic Ball Valve, Rev. 0, Date: 08/25/15, Page: 1;

Drawing No. CNH-E6N-G---02-L, 1" CNH-E6, 2-WAY, API-607, 600# Cryogenic Ball Valve, Rev. 1, Date: 02/21/17, Page: 1;

Drawing No. CNH-G6L-G---04-L, 1-1/2" CNH-G6, 2-WAY, API-607, 150# Cryogenic Ball Valve, Rev. 1, Date: 02/27/18, Page: 1;

Drawing No. CNH-G6M-G---04-L, 1-1/2" CNH-G6, 2-WAY, API-607, 300# Cryogenic Ball Valve, Rev. 0, Date: 06/24/15, Page: 1;

Drawing No. CNH-G6N-G---02-L, 1-1/2" CNH-G6, 2-WAY, API-607, 600# Cryogenic Ball Valve, Rev. 1, Date: 01/24/17, Page: 1;

Drawing No. CNH-H6L-G---04-L, 2" CNH-H6, 2-WAY, API-607, 150# Cryogenic Ball Valve, Rev. 0, Date: 04/02/15, Page: 1;

Drawing No. CNH-H6L9G---66-T291, 2" CNH-H6, 2-WAY, API-607, 150# Cryogenic Ball Valve, Rev. 0, Date: 09/29/17, Page: 1;

Drawing No. CNH-H6M-G---04-L, 2" CNH-H6, 2-WAY, API-607, 300# Cryogenic Ball Valve, Rev. 0, Date: 04/01/15, Page: 1;

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Drawing No. CNH-H6N-G---02-L, 2" CNH-H6, 2-WAY, API-607, 600# Cryogenic Ball Valve, Rev. 0, Date: 12/28/16, Page: 1;

Drawing No. CNH-K6L-G---09-L, 3" CNH-K6, 2-WAY, API-607, 150# Cryogenic Ball Valve, Rev. 1, Date: 07/15/15, Page: 1;

Drawing No. CNH-K6M-G---09-L, 3" CNH-K6, 2-WAY, API-607, 300# Cryogenic Ball Valve, Rev. 1, Date: 07/15/15, Page: 1;

Drawing No. CNH-K6N-G---02-L, 3" CNH-K6, 2-WAY, API-607, 600# Cryogenic Ball Valve, Rev. 0, Date: 07/25/17, Page: 1;

Drawing No. CNH-L6L-G---02-L, 4" CNH-L6, 2-WAY, API-607, 150# Cryogenic Ball Valve, Rev. 0, Date: 01/19/16, Page: 1;

Drawing No. CNH-L6M-G---02-L, 4" CNH-L6, 2-WAY, API-607, 300# Cryogenic Ball Valve, Rev. 0, Date: 01/19/16, Page: 1;

Drawing No. CNH-L6N-G---02-L, 4" CNH-L6, 2-WAY, API-607, 600# Cryogenic Ball Valve, Rev. 0, Date: 02/27/18, Page: 1;

C6 Series:

Drawing No. C6H-C6N-G---02-L, 1/2" C6H-C6, 2-WAY, API-607, 600# Cryogenic Ball Valve, Rev. 0, Date: 05/18/17, Page: 1;

Drawing No. C6H-D6N-G---02-L, 3/4" C6H-D6, 2-WAY, API-607, 600# Cryogenic Ball Valve, Rev. 0, Date: 05/18/17, Page: 1;

Drawing No. C6H-E6N-G---02-L, 1" C6H-E6, 2-WAY, API-607, 600# Cryogenic Ball Valve, Rev. 0, Date: 02/08/17, Page: 1;

Drawing No. C6H-G6N-G---02-L, 1-1/2" C6H-G6, 2-WAY, API-607, 600# Cryogenic Ball Valve, Rev. 0, Date: 01/24/17, Page: 1;

Drawing No. C6H-H6N-G---02-L, 2" C6H-H6, 2-WAY, API-607, 600# Cryogenic Ball Valve, Rev. 0, Date: 01/20/17, Page: 1;

IB Series:

Drawing No. IBH-F5EEG44-66--T368, 1", 2-WAY, 2500# Cryogenic Instrument Valve, Rev. 0, Date: 11/09/17, Page: 1;

Drawing No. IBH-F5EEGEE-66--T292, 3/4", 2-WAY, Cryogenic Instrument Valve up to 5367 psig, Rev. 0, Date: 09/29/17, Page: 1;

Test Reports:

ABS Prototype Test Report No. C3484657, Date: 4/29/18;

Fire Test Reports:

Project No. 214227 per API 607 6th Edition (2010), Date: 8/5/2014, 2" Class 150 CNH-H6 Cryogenic Ball Valve;

Project No. 214142 per API 607 6th Edition (2010), Date: 6/3/2014, 2" Class 150 CPHLH7 Cryogenic Ball Valve;

Project No. 217425 per API 607 7th Edition (2016), Date: 1/26/2018, 2" Class 600 CNH-H6 Cryogenic Ball Valve;

Project No. 217317 per API 607 7th Edition (2016), Date: 9/29/2017, 2" Class 600 C6H-H6 Cryogenic Ball Valve;

Terms of Validity:

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Tier: 5 - Unit Certification Required

STANDARDS**ABS Rules:**

Rules for Conditions of Classification, Part 1 - 2018 Steel Vessels Rules 1-1-4/7.7, 1-1-A3, 1-1-A4, which covers the following:

2018 Steel Vessels 4-6-1/7.1, 4-6-2/3, 4-6-2/5.11, 5C-8-5/13.1, 5C-8-6/2.2 and 5C-8-6/Table 4;

Rules for Conditions of Classification, Part 1 - 2018 Offshore Units and Structures 1-1-4/9.7, 1-1-A2, 1-1-A3, which covers the following:

2018 Mobile Offshore Drilling Units 4-2-2/9, 4-2-2/17.

National:

ASME B16.34 - 2017 Valves - Flanged, Threaded and Welding End;

MSS SP 72 - 2010A - Ball Valves with Flanged or Butt-Welding Ends for General Service;

API 607 (6th/7th Edition) Fire Test for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats;

International:

NA

Government:

NA

EUMED:

NA

OTHERS:

NA