



CERTIFICATE NUMBER	20-2042586-PDA
EFFECTIVE DATE	28-Oct-2020
EXPIRY DATE	27-Oct-2025
ABS TECHNICAL OFFICE	Hamburg Engineering Department

CERTIFICATE OF Product Design Assessment

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

HEROSE GMBH

located at

ELLY-HEUSS-KNAPP-STR. 12, BAD OLDESLOE, Germany, 23843

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 "Globe valve, Check valve, Gate valve, Strainer, Divertor valve, Safety valve

*** Detailed Model numbers of each type are indicated on the attachment"**

This Product Design Assessment (PDA) Certificate remains valid until 27/Oct/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

Efstratios Maliatsos, 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)

HEROSE GMBH

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Tier: 5 - Unit Certification Required

Product: Cryogenic Valve

Model: "Globe valve, Check valve, Gate valve, Strainer, Divertor valve, Safety valve
* Detailed Model numbers of each type are indicated on the attachment"

Intended Service:

Cryogenic service including LNG on board of Ships or Offshore Facilities

Description:

Globe valves with flanged, threaded or welded sleeve connection consisting of stainless steel body, disc seat with PTFE or PTFE compound optional in fire safe design, bonnet with or without extension in stainless steel or bronze, manual or pneumatically operated, with or without non-return function. Bellow sealed bonnet available.

Strainer, check valves, manual or pneumatically operated gate valves and divertor valves made of materials stainless steel or bronze with soft seals, welded, flanged or threaded connection types available.

Standard or full lift safety valves, optional with lifting device or bellow sealed, with thread connection consisting of stainless steel or bronze body, soft or metal seated disc.

*Details of size and material of the valves are indicated on the attachment.

Rating:

Temperature range for valves:

-196°C up to +120°C for valve of 1.4308

-255°C up to +120°C for valve of 1.4409

Safety Valves: from -270°C up to +225°C

* Pressure rating is indicated on the attachment.

Service Restriction:

1. Unit Certification is required for the products intended to be used at a working temperature at or below -55 deg. C and testing is to be carried out in the presence of the Surveyor, which is to include hydrostatic test of the valve body at a pressure equal to 1.5 times the design pressure, and seat & stem leakage test at a pressure equal to 1.1 times the design pressure in accordance with manufacture's testing procedure. In addition, cryogenic testing consisting of valve operation & leakage verification for a minimum of 10% of each type and size of valve per 5C-8-5/13.1.1(b) & 5C-13-16/7.1.1 of the Marine Vessels Rules.

2. Welded sleeve connections shall only be used for open-ended lines with an external diameter of 50 mm or less and design temperatures not colder than -55°C as per 5C-8-5/8.2.2 of the Marine Vessel Rules.

3. Screwed connection cannot be used for cargo piping and should only be used for accessory lines and instrumentation lines with external diameters of 25mm or less as per 5C-8-5/8.2.3 of the Marine Vessels Rules.

4. Except globe valves that are fire tested (valves up to DN 200), valves should not be used for gas cargo system piping outside the cargo tanks except for a short length of pipe attached to the cargo tanks in which case, a fire-resisting insulation shall be provided in accordance with 5C-8-5/12.2 of the Marine Vessels Rules.

5. Installation, welding and joining procedures are to the satisfaction of the attending Surveyor.

6. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

Comments:

1. All valves are to bear permanent identification, such as the manufacturer's name or trademark, standard of compliance, material identify, pressure rating, etc. as required by the standard of compliance and at which the manufacturer guarantees the valve to meet the requirements of the standards. 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 in accordance with 4-6-2/5.11.4 and 4-6-1/7.1.4 of the 2020 Marine Vessels Rules.

2. Copies of the certificate material test reports are to be made available to the attending Surveyor and are to be traceable to the material.

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

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4. Material testing of the products intended to be used at a working temperature below -55 degree C is to be witnessed by an ABS Surveyor in accordance with 5C-8-6 of the Marine Vessel Rules.

5. The manufacturer is to guarantee that the valve has been tested before shipment to the pressure required by the pressure rating of the valve.

Notes/Drawing/Documentation:

Drawing No. 02 Overview drawings, 02 Overview drawings, Revision: 0, Pages: 98

Drawing No. 04 Drawing inlet, 04 Drawing inlet, Revision: 0, Pages: 65

Drawing No. 05 Strength calculation safety valve, 05 Strength calculation safety valve, Revision: 0, Pages: 27

Drawing No. 05_Type_Inlet-overview, Inlet-overview, Revision: -, Pages: 2

Drawing No. 06 burst tests results, tests results, Revision: -, Pages: 10

Drawing No. 1000662876-50, LR testing certificate, Revision: 00, Pages: 21

Drawing No. 2018_1320-GK-03580-01, Fire test DIN ISO 10497:2010, Revision: 00, Pages: 5

Drawing No. 2020-08_ABS_export-for-renewal_incl-Drawing-name, drawing name, Revision: -, Pages: 18

Drawing No. 20201022_094831, Certificateacc B16.34-2012, Revision: 00, Pages: 30

Drawing No. 592393-10-1, Material certificate BV, Revision: 00, Pages: 10

Drawing No. Act on form alert, Act on form alert, Revision: -, Pages: 3

Drawing No. Catalogue sheet, 2020/6 Ed Catalogue, Revision: 00, Pages: 198

Drawing No. DN200_streghts-calculation, DN200_streghts-calculation, Revision: 0, Pages: 13

Drawing No. PMA 1, PED annex 1, no 4 TUV Nord certificate, Revision: 02, Pages: 10

Drawing No. Signed test report for HB20PTB00033, DIN EN 12266-1/2 2020-8, Revision: 00, Pages: 3

Drawing No. cryo test results, LR tests ed 2015 and 2019, Revision: 0, Pages: 5

Drawing No. type overview_rev-0, type overview_, Revision: -, Pages: 4

Terms of Validity:

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STANDARDS

ABS Rules:

2020 Rules for Conditions of Classification: 1-1-4/7.7, 1-1-A3 and A4, which covers the following:

2020 Rules for Building and Classing Marine Vessels 1-1-4/7.7, 1-1-A3, 1-1-A4, 4-6-2/5.11, 4-6-1/7.1, 4-6-2/5.11 /5.15 & 5.17, 5C-8-5/11.3, 5C-8-5/12.2, 5C-8-5/13.1, 5C-8-5/8.2.1, 5C-8-6/2.2 & 5C-8-6/Table 4, 5C-13-16/7.1, 5C-13-7/Table 4, 5C-13-16/Table 5

2020 Rules for Conditions of Classification – Offshore Units and Structures: 1-1-4/9.7, 1-1-A2 and A3, which covers the following:

2020 Rules for Building and Classing Mobile Offshore Units (2020) 1-1-4/9.7, 4-2-2/9

National:

BS 6364: 1984 Specification for valves for cryogenic service (published February 1984)

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International:

IGC Code (2016 2nd Edition), 5.11.6.1, 5.12, 5.13.1, 6.2.2, 8.2.5.1, Table 6.4

IGF Code (2016 Edition), 16.7.1, Table 7.4

Government:

NA

EUMED:

NA

OTHERS:

NA