



CERTIFICATE NUMBER
EFFECTIVE DATE
EXPIRY DATE
ABS TECHNICAL OFFICE

25-0078491-PDA
11-Mar-2025
10-Mar-2030
Genoa Engineering Department

CERTIFICATE OF Product Design Assessment

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

SAMSON AKTIENGESELLSCHAFT

located at

**WEISMUELLERSTRASSE 3, , FRANKFURT AM MAIN, Germany,
60314**

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: 3241, 3244, 3251, 3254, 3256
Endorsements:
Tier: 5 - Unit Certification Required

This Product Design Assessment (PDA) Certificate remains valid until 10/Mar/2030 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

Simone Cavecchia, 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)

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Tier: 5 - Unit Certification Required

Product: Cryogenic Valve
Model: 3241, 3244, 3251, 3254, 3256
Endorsements:

Intended Service:

Cryogenic globe valves intended for use as control valves in installations and equipment of liquified gas tankers and liquified gas terminals, in arrangements and installations of machinery, equipment and systems for vessels operating with gas or low-flashpoint liquids as fuel.

Description:

Stainless steel flanged or butt welded valves with metal to metal seating.

For the description of the Materials, please refer to the Attachment: 1 - "Material Details"

Rating:

Please refer to the Attachment 2 - "Valve Rating"

Service Restriction:

- 1) Unit Certification is required for this product as per section 5C-8-5/13.1.1 (b) of the Marine Vessels Rules. Testing is to include hydrostatic test of the valve body at a pressure equal to 1.5 times the design pressure; 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 for valves other than safety valves intended to be used at a working temperature below -55°C .
- 2) Valve material testing is to be witnessed by an ABS Surveyor, as per applicable Recognized Standard, when the design temperature is at or below -55°C , in accordance with 5C-8-6/2.2 (ABS) of ABS Marine Vessel Rules.

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 Marine Vessels Rules.
2. For Working temperature above 38°C , an appropriate de-rating coefficient is to be applied, equal to the ratio of the valve metal's allowable stress at working temperature vs. allowable stress at ambient temperature (as per ASME VIII Div. 1 Code or other Standard not less effective).
3. Installation and joining procedures are to be to the satisfaction of the attending Surveyor.
4. This Certificate specifies two pressures in the Rating section: the design pressure which is aligned with the provided prototype cryogenic test reports, and the valve class pressure which is indicated in brackets and is mentioned as reference only. Any valve which is intended to be used at pressure exceeding the certified design pressure, shall be considered not covered by the present certificate
5. The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

Notes/Drawing/Documentation:

Testing Procedure No. Q-1066, Functional and Tightness Testing on Valves at Cryogenic Temperatures with Seat Leakage Test, Rev. 04, Pages 4,
Testing Procedure No. Q-1067, Functional and Tightness Testing on Valves at Cryogenic Temperatures with Seat Leakage Test, Rev. 07, Pages 6.
Document No. 1120-1130, Standard Valve specification, Rev. 00, Pages 62.
VALVE TYPE 3241
Drawing No. 1010-5745, Valve Wall thicknesses for inspections, Rev. 03, Page 1,
Drawing No. 1010-5838, Valve 3241 DN200-300/NPS8-12 PN-40/CL-300, Rev. 02, Page 1
Drawing No. 1040-0095, Valve 3241 SINGLE-SEATED GLOBE VALVE, Rev. 09, Page 1,
Drawing No. 1040-0121, Valve 3241 SINGLE-SEATED GLOBE VALVE, Rev.10, Page 1,

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Tier: 5 - Unit Certification Required

Drawing No. 1040-0122, Valve 3241 SINGLE-SEATED GLOBE VALVE, Rev.12, Page 1,
Drawing No. 1040-0125, Valve 3241 3241 Valve, STD DN200-300/NPS8-12, Rev.05, Page 1,
Drawing No. 1040-0126, Valve 3241 Valve, IS DN200-300/NPS8-12, Rev. 04, Page 1,
Drawing No. 1040-0127, Valve 3241 Valve, BP DN200-300/NPS8-12, Rev. 06, Page 1,
Drawing No. 1040-0758, Bonnet 3241 K3 DN15-150 NPS 1/2-6, Rev. 02, Page 1,
Drawing No. 1000100062, Valve WALL THICKNESSES FOR INSPECTION, Rev. 00, Page1,
Drawing No. 1000115458, Body/housing 3241 Body RF NPS1 CL300 Marine Approval, Rev. 01, Page 1,
Drawing No. 1000115459, Flange 3241/3244 Flange NPS1/2-1, Rev. 02, Page 1
Drawing No. 1000115478, Intermediate piece 3241/44 IS/BS wo B. NPS1/2-1 Marine, Rev. 02; Page 1,
Drawing No. 1000115573, Flange 3241/3244 Flange NPS 4 Marine, Rev. 03, Page 1,
Drawing No. 1000115575, Intermediate piece 3241/3244 IT-L NPS4, Rev. 04, Page 1,
Cryogenic Test Report No. 1000361962 on 3241 NPS 1" at 20 bar dated 15.01.2024 at Samson Facility,
Cryogenic Test Report No. 2516776 on 3241 NPS 1" at 40 bar dated 05.12.2018 at Samson Facility,
Cryogenic Test Report No. 219760730 on 3241 NPS 1 1/2" at 15 bar dated 14.09.2016 at Samson Facility,
Cryogenic Test Report No. 1000361962 on 3241 NPS 1 1/2" at 34,5 bar dated 15.01.2024 at Samson Facility,
Cryogenic Test Report No. 219760730 on 3241 NPS 2" at 15 bar dated 13.09.2016 at Samson Facility,
Cryogenic Test Report No. 1000361962 on 3241 NPS 2" at 34,5 bar dated 15.01.2024 at Samson Facility,
Cryogenic Test Report No. 1000312153 on 3241 NPS 3" at 11 bar dated 31.10.2023 at Samson Facility,
Cryogenic Test Report No. 1000354379 on 3241 NPS 3" at 27,5 bar dated 13.12.2023 at Samson Facility,
Cryogenic Test Report No. 2383366 on 3241 NPS 4" at 16,5 bar dated 27.09.2017 at Samson Facility,
Cryogenic Test Report No. WO-6464 on 3241 NPS 6" at 16,5 bar dated 28.03.2017 at Samson Facility,
Cryogenic Test Report No. 1139145 on 3241 NPS 6 at 5 bar dated 08.04.2021 at Samson Facility,
Cryogenic Test Report No. N141T5JB on 3241 NPS 8" at 29 bar dated 31.03.2020 at Samson Facility,
Cryogenic Test Report No. WO-6228 on 3241 NPS 12" at 16,5 bar dated 02.09.2016 at Samson Facility.
VALVE TYPE 3244

Drawing No. 1010-5860-SWD, Data sheet Wall thicknesses for inspection, Rev. 1.b, Page 1,
Drawing No. 1040-0231, 3244 THREE-WAYS CONTROL VALVE, Rev. 05, Page 1,
Drawing No. 1040-0234, 3244 THREE-WAYS CONTROL VALVE, Rev. 05, Page 1,
Drawing No. 1040-0235, 3244 THREE-WAYS CONTROL VALVE, Rev. 04, Page 1,
Drawing No. 1000115572, Body/housing 3244 Body RF NPS4 CL300, Rev. 01, Page 1,
Drawing No. 1000115573, Flange 3241/3244 Flange NPS 4, Rev. 02, Page 1,
Drawing No. 1000115575, Int. Piece 3241/3244 3244 IT-L NPS4 Marine Approval, Rev. 02, Page 1,
Cryogenic Test Report No. 2154737 on 3244 NPS 2" at 10 bar dated 21.04.2015 at Samson Facility,
Cryogenic Test Report No. 1000184058 on 3244 NPS 4" at 16,5 bar dated 19.07.2021 at Samson Facility.
VALVE TYPE 3251

Drawing No. 1010-5742-SWD, Data sheet Wall thicknesses for inspection, Rev. 3.f, Page 1,
Drawing No. 1040-0129, Valve 3251 a. 3251-AM SINGLE-SEATED GLOBE VALVE, Rev. 10, Page 1,
Drawing No. 1040-0130, Valve 3251 a. 3251-AM Single-seated globe valve, Rev. 06, Page 1,
Drawing No. 1040-0131, Valve 3251 a. 3251-AM Single-seated globe valve, Rev. 04, Page 1,
Cryogenic Test Report No. 1000255660 on 3251 NPS 1" at 14,5 bar dated 05.09.2022 at Samson Facility,
Cryogenic Test Report No. HN2669281 on 3251 NPS 1 1/2" at 400 bar dated 10.12.2014 at Samson Facility,
Cryogenic Test Report No. 1000024595 on 3251 NPS 2" at 81,5 bar dated 21.04.2020 at Samson Facility,
Cryogenic Test Report No. WO-6199 on 3251 NPS 2" at 407 bar dated 22.06.2016 at Samson Facility,
Cryogenic Test Report No. N140252A-2 on 3251 NPS 3" at 170 bar dated 31.07.2014 at Samson Facility,
Cryogenic Test Report No. 1000024595 on 3251 NPS 4" at 78.5 bar dated 21.04.2020 at Samson Facility,
Cryogenic Test Report No. WO-6466 on 3251 NPS 6" at 187 bar dated 28.03.2017 at Samson Facility.
VALVE TYPE 3254

Drawing No. 1010-5842-SWD, Data sheet Wall thicknesses for inspection, Rev. 2.c, Page 1,
Drawing No. 1040-0135, Valve 3254 SINGLE-SEATED GLOBE VALVE, Rev. 03, Page 1,
Drawing No. 1040-0136, Valve 3254 SINGLE-SEATED GLOBE VALVE, Rev. 02, Page 1,
Cryogenic Test Report No. WO-7658 on 3254 NPS 3" at 187 bar dated 19-09-2019 at Samson Facility,
Cryogenic Test Report No. WO-6230 on 3254 NPS 4" at 187 bar dated 07-09-2016 at Samson Facility,
VALVE TYPE 3256

Drawing No. 1010-5748-SWD, Data sheet Wall thicknesses for inspection, Rev. 3.d, Page 1,

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Drawing No. 1040-0138, Valve 3256 ANGLE VALVE, Rev. 01, Page 1,
Drawing No. 1040-0139, Valve 3256 ANGLE VALVE, Rev. 01, Page 1,
Drawing No. 1040-0140, Valve 3256 ANGLE VALVE, Rev. 03, Page 1,
Cryogenic Test Report No. 202300428-R001 on 3256 NPS 1 1/2" at 385 bar dated 15-09-2023 at Samson Facility,
Cryogenic Test Report No. WO-9230 on 3256 NPS 2" at 407 bar dated 02-12-2021 at Samson Facility,
Cryogenic Test Report No. HN2669281 on 3256 NPS 3" at 330 bar dated 10-12-2014 at Samson Facility.

Terms of Validity:

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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.

STANDARDS

ABS Rules:

2025 Rules for Conditions of Classification, 1A-1-4/7.7, 1A-1-A3, 1A-1-A4, which covers the following:
2025 Rules for Building and Classing Marine Vessels: 4-6-1/7.1, 4-6-2/5.11, 5C-8-5/11.6.1, 5C-8-5/12.2, 5C-8-5/13.1, 5C-8-6/2.2, 5C-13-7/3.6.1, and 5C-13-16/7.1.
2025 Rules for Conditions of Classification, 1B-1-4/9.7, 1B-1-A2, 1B-1-A3, which covers the following:
2025 Mobile Offshore Units Rules: 4-2-2/9.

National:

NA

International:

IGC Code – International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk, 2016 Edition;
IGF Code – International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels, 2016 Edition.

Government:

NA

EUMED:

NA

OTHERS:

NA

ATTACHMENT 1 -MATERIAL DETAILS

| Application | Materials for valve body and bonnet | | Materials for shaft, cone and seat | |
|-------------|-------------------------------------|--------------------------|------------------------------------|--------------------------|
| | DIN Mat. No. | ANSI Material | DIN Mat. No. | ANSI Material |
| All valves | 1.4301 | A182 F304 | | |
| | 1.4301 | A479 304 | | |
| | 1.4306 | A182 F304L | | |
| | 1.4306 | A479 304L | | |
| | 1.4308 | A351 CF8 | | |
| | 1.4309 | A351 CF3 | | |
| | 1.4401/ 1.4404 | A182 F316/ A182 F316L | 1.4401/ 1.4404 | A182 F316/ A182 F316L |
| | 1.4401/ 1.4404 | A479 316/ A479 316L | 1.4401/ 1.4404 | A479 316/ A479 316L |
| | 1.4408 | A351 CF8M | 1.4408 | A351 CF8M |
| | 1.4409 | A351 CF3M | 1.4409 | A351 CF3M |
| | | | | |

ATTACHMENT 2- VALVE RATINGS

Valve Type 3241

| Size (inch) | Design Pressure (bar) | Design Temperature °C | Valve class |
|-------------|-----------------------|-----------------------|-------------|
| NPS 1 | 20 | -196 °C to +450 °C | 150 |
| | 40 | -196 °C to +450 °C | 300 |
| NPS 1 ½ | 15 | -196 °C to +450 °C | 150 |
| | 34,5 | -196 °C to +450 °C | 300 |
| NPS 2 | 15 | -196 °C to +450 °C | 150 |
| | 34,5 | -196 °C to +450 °C | 300 |
| NPS 3 | 11 | -196 °C to +450 °C | 150 |
| | 27,5 | -196 °C to +450 °C | 300 |
| NPS 4 | 16,5 | -196 °C to +450 °C | 150 |
| NPS 6 | 16,5 | -196 °C to +450 °C | 150 |
| | 5 | -196 °C to +450 °C | 300 |
| NPS 8 | 29 | -165 °C to +450 °C | 150 |
| NPS 12 | 16,5 | -196 °C to +450 °C | 150 |

Valve Type 3244

| Size (inch) | Design Pressure (bar) | Design Temperature °C | Valve class |
|-------------|-----------------------|-----------------------|-------------|
| NPS 2 | 10 | -196 °C to +450 °C | 150 |
| NPS 4 | 16,5 | -196 °C to +450 °C | 300 |

Valve Type 3251

| Size (inch) | Design Pressure (bar) | Design Temperature °C | Valve class |
|-------------|-----------------------|-----------------------|-------------|
| NPS 1 | 14,5 | -196 °C to +550 °C | 150 |
| NPS 1 ½ | 400 | -196 °C to +550 °C | 2500 |
| NPS 2 | 81,5 | -196 °C to +550 °C | 900 |
| | 407 | -196 °C to +550 °C | 2500 |
| NPS 3 | 170 | -165 °C to +550 °C | 1500 |
| NPS 4 | 78,5 | -196 °C to +550 °C | 900 |
| NPS 6 | 187 | -196 °C to +550 °C | 1500 |

Valve Type 3254

| Size (inch) | Design Pressure (bar) | Design Temperature °C | Valve class |
|-------------|-----------------------|-----------------------|-------------|
| NPS 3 | 187 | -196 °C to +550 °C | 1500 |
| NPS 4 | 187 | -196 °C to +550 °C | 1500 |

Valve Type 3256

| Size (inch) | Design Pressure (bar) | Design Temperature °C | Valve class |
|-------------|-----------------------|-----------------------|-------------|
| NPS 1 ½ | 385 | -196 °C to +550 °C | 2500 |
| NPS 2 | 407 | -196 °C to +550 °C | 2500 |
| NPS 3 | 330 | -196 °C to +550 °C | 2500 |