



Certificate No:
TAP00001ZS

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Safety Valve

with type designation(s)
Type 2600

Issued to

Broady Flow Control Ltd
Hull, United Kingdom

is found to comply with

DNV GL rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018
DNV GL class programme DNVGL-CP-0186 – Type approval – Valves

Application :

Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV.

K. factor: Sonic flow for gas: 0.905

Issued at **Høvik** on **2021-09-22**

for **DNV**

This Certificate is valid until **2026-09-21**.

DNV local station: **Manchester**

Approval Engineer: **Maheshraja Venkatesan**

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Zeinab Sharifi
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Form code: TA 251

Revision: 2021-03

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Product description

Type 2600 spring operated re-closable safety valves with sizes: ½" x 1", ¾" x 1" and 1" x 1" comprising of threaded type (NPT – ASME B1.20.1) or flanged type end connections (as per ASME B16.5).

Design standard : API 520 part I

Material of construction

Body, Cap, Nozzle and Bonnet	Stainless steel, ASME SA351 Grade CF8M
Disc	Stainless steel, ASTM A564 Grade 630 Stainless steel, ASTM A276 Gr. 316 (for cryogenic applications)
Non-metallic sealing	Flexicarb RGS 4 (Graphite); Flexitallic 1065 (Graphite filled PTFE yarn); PTFE G400; Virgin PTFE

Application/Limitation

Safety valves covered by this certificate are approved to be used for gas service with the design pressure of 140 bar(g).

Design temperature range depending on the non-metallic material used:

Flexicarb RGS 4	: -196°C to 370°C
Flexitallic 1065	: -100°C to 260°C
PTFE G400	: -196°C to 260°C
Virgin PTFE	: -196°C to 260°C

Model	Nominal size		Orifice area
	Inlet	Outlet	
Type 2600	½"	1"	0.06 sq. in
	¾"	1"	
	1"	1"	

Materials and material protection chosen for the specific system shall be suitable for the intended medium and environmental conditions. Valves of austenitic stainless steel shall not be used in direct contact with seawater.

On boilers or steam-heated steam generators the following limitations applies:

- Safety-valves of ordinary type with seats of less than 38 mm inside diameter shall not be used. (Reference is made to DNV Ship Rules Pt.4 Ch.7 Sec.5 [2.1.8])
- For full lift safety valves, the inside seat diameter shall not be less than 20 mm. (Reference is made to DNV Ship Rules Pt.4 Ch.7 Sec.5 [2.1.8])
- The discharge from safety valves shall be to a point where hazard is not created. (Reference is made to DNV Ship Rules Pt.4 Ch.6 Sec.5 [7.4.1])

Valves covered by this certificate are not to be considered fire safe and therefore shall not be installed wherever fire safe application is required; e.g. as pressure relief valves on cargo tanks in liquefied gas tankers.

Type Approval documentation

<u>Document no.</u>	<u>Rev.</u>	<u>Title</u>
26/GA1/ ; 26/GA/2	01	Type 2600 GA drawings
NP0016	05	Type 2600 Nozzle drawing
PL-26-S1, Issue 04	-	Type 2600 Parts list
2000-640-1	02	Type 2600 cap drawing
NP 0017	04	Flanged 2600 Body
2020-501-7	06	Screwed 2600 Body
2010-150-1	04	Type 2600 Disc
MC7642	01	0.06" orifice, ¾" ANSI 150 Flanged Nozzle Type 2600
MC7643	01	0.06" orifice, ½" ANSI 150 Flanged Nozzle Type 2600
MC7587	02	1" ANSI 150 Flanged Nozzle Type 2600
QF190 Type 2600	-	Valve Design calculation Sheet
-	-	Type 2600 Co-efficient Certification
26003-SN-000	-	Cryogenic Test results witnessed by DNV dated 2021-07-01
WI V6.6	-	Hydrostatic (water) testing of valves/ components up to a maximum of 700 barg
WI V11.8	-	Seat Leakage testing for Valves

- WI V15.4 - Functional Testing of Safety Relief valves using Nitrogen up to Maximum Pressure of 276 bar(g)
- WI V25.3 - Test Procedure : Safety relief valve bellows Test & body/Nozzle, body/Bonnet Back Pressure Test
- WI V42.4 - Test Procedure : Low Temperature testing of Safety Relief Valve on Cryogenic service
- FLEXICARB RGS4, FLEXITALLIC 1065, REF C003 SEPT 2012 - Gasket - Technical data sheets

Tests carried out

Flow test, Cryogenic leakage test as per ISO 21013-1

Production testing and Certification

- All valve bodies shall be subject by the manufacturer to a hydrostatic test at a pressure equal to 1.5 times the set pressure (maximum working pressure at room temperature).
- Each valve shall be subject to leakage test (at 90% of set pressure) after reset and have set pressure sealed and verified.

Certification for the actual intended application shall follow the latest applicable edition of the Rules (as mentioned on the front page of this certificate).

Marking of product

Minimum marking requirements shall be as outlined in the standard ISO 21013-1 [10].

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.