



MARINE DIVISION

Certificate number: 21990/A0 BV

File number: ACM 145/2507/02

Product code: 73511

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

BROADY FLOW CONTROL Ltd.

Kingston-upon-Hull - UNITED KINGDOM

for the type of product

PRESSURE RELIEF VALVES FOR LIQUEFIED GAS PIPING SYSTEMS

Broady Series 2600 & 3500 Safety Relief Valves

Requirements:

- Bureau Veritas Rules for the Classification of Steel Ships
- IGC Code

This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 20 Oct 2014

For BUREAU VERITAS,

At BV LONDON, on 20 Oct 2009,

Spencer Yule



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine Division available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

Broady Series 2600 & 3500 Safety Relief Valves (Boiler & Pressure vessel)

Series 2600: Flanged, direct acting, full lift Safety Relief Valves, spring loaded

Series 3500: Flanged full lift Safety Relief Valves, spring loaded and bellows

1.1 Technical Data

Valve type	2600	3500
Valve size (inlet x outlet)	1/2" x 1" / 3/4" x 1" / 1" x 1"	1" x 2" / 1-1/2" x 2" / 1-1/2" x 3" 2" x 3" / 3" x 4" / 3" x 6" / 4" x 6" 6" x 8" / 6" x 10" / 8" x 10"
Max. working pressure (bar)	140	442
Rating (inlet)	ANSI # 150 to ANSI # 1500	ANSI # 150 to ANSI # 2500
Rating (outlet)	ANSI # 150 and ANSI # 300	ANSI # 150 and ANSI # 300

Min. design temperature: -180 °C. Pressure and Temperature limits according to the manufacturer's specification.

1.2 Materials

Parts	Series 2600	Series 3500
Body & Bonnet	Stainless steel A351 CF8M	Stainless steel A351 CF8M
Nozzle	type 316 SS	type 316 SS
Spring	type 316 SS	type 316 SS
Disc	type 316 SS	type 316 SS
Bellows	-	type 316

When other materials are used according to manufacturer's instructions, the BV agreement is to be obtained.

2. DOCUMENTS AND DRAWINGS

- Manufacturer brochure Series 2600 - 2003 issue
- Manufacturer brochure Series 3500 - 2004 issue
- Drawings N° 26/GA2/ Series 2600 Safety relief valve and parts list
- Drawings N° 35/GA1/ ; N° 35/GA3/ and N° 35/GA4/ Series 3500 Safety relief valve and parts list
- Drawings N° 35/OL1/ ; N° 35/OL3/ and N° 35/OL4/ Series 3500 Safety relief valve and parts list
- Drawings N° 35/PL1/ ; N° 35/PL3/ and N° 35/PL4/ Series 3500 Safety relief valve and parts list
- Calculation & valve data sheets
- Operating Instructions SD23/2600 Version 1.6 10/09 and SD23/3500 Version 2.2 10/09

No departure from the above documents shall be made without the prior consent of the Society. The manufacturer must inform the Society of any modification or changes to these documents and drawings.

3. TEST REPORTS

- Tests carried out: Flow test, pressure test, set and leakage test, cryogenic test at a test temperature of -180°C.
- Capacity test carried out. K factor (sonic flow) = 0.956.

4. APPLICATION / LIMITATION

- 4.1 Approved as safety relief valves intended for cryogenic use on board liquefied gas carriers classed with the Society.
- 4.2 The pressure relief valves belong to class I according to the relevant requirements stated in Part D, Ch 9, Sec 5 of the Society Rules.
- 4.3 Materials of the components including gaskets to be suitable with the service temperature and to comply with table 6.4 of IGC Code and relevant requirements in Part D of the Society's Rules.
- 4.4 Prior to the use on cargo tanks of liquefied gas carriers, and depending on the nature of the cargoes, the pressure relief valves shall be required by the Society to be additionally tested for their capacity in accordance with Requirements stated on the front page of this certificate.
- 4.5 The pressure relief valve is to be set and sealed and installed according to manufacturer's instructions and Bureau Veritas Rules. The instruction manual and the pressure setting reports should be retained aboard the ship.

5. PRODUCTION SURVEY REQUIREMENTS

5.1 The products are to be manufactured, examined and tested by the manufacturer in accordance with the approved type described in this certificate and Requirements stated on the front page of this certificate. Arrangements shall be made for a Society's Surveyor to attend the tests and examinations at manufacturer's works or to perform the relevant audits when an alternative survey scheme, BV Mode I, has been arranged, in order to issue the Bureau Veritas certificate for the approved type to be fitted on board ships classed with Bureau Veritas.

5.2 Production sites are to be recognized by Bureau Veritas as per NR 320 for IBV products. To this end, the manufacturer has to make the necessary arrangements for a Society's Surveyor to perform visits and product audits at the production sites.

5.3 The manufacturer has declared to Bureau Veritas that the products detailed in this certificate are manufactured at the production site stated on the front page of this certificate.

5.4 The valve material is to be subjected to Charpy impact test in accordance with applicable requirements of IGC Code and Bureau Veritas Rules Materials.

5.5 Bureau Veritas Certificates are required for materials of valve housings of Class I ($DN \geq 50$). Materials of valve housings of Class I ($DN < 50$) and for other parts of Class I are to be delivered with Work's certificates.

5.6 Each safety valve is to be hydraulically pressure tested to 1.5 times the design pressure.

6. MARKING OF PRODUCT

Each safety valve is to be clearly marked with at least:

- Manufacturer's name or logo
- Type designation
- Test and report number
- Valve serial number
- Year of manufacture
- Society's brand as relevant

7. OTHERS

This approval is given on the understanding that the Society reserves the right to require check tests to be carried out on the products at any time, and that the manufacturer will accept the responsibility for informing shipbuilders or their sub-contractors of the proper methods of use and general maintenance of the products and of the conditions of this approval.

*** END OF CERTIFICATE ***