



MARINE DIVISION

Certificate number: 12263/B0 BV

File number: ACM 145/1206/04-06

Product code: 2232I

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

www.veristar.com

TYPE APPROVAL CERTIFICATE

This certificate is issued to

LESER GmbH & Co. KG
Hamburg - GERMANY

for the type of product

PRESSURE RELIEF VALVES, SPRING LOADED

FLANGED FULL LIFT SAFETY RELIEF VALVES Type 441, 442
FLANGED SAFETY RELIEF VALVES Type 431, 433

Requirements:

BUREAU VERITAS Rules for the Classification of Steel Ships
BUREAU VERITAS Rules for the Classification of Offshore Units
BUREAU VERITAS Rules for Materials and Welding
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: 04 Oct 2017

For BUREAU VERITAS,

At BV HAMBURG, on 04 Oct 2012,

Adama Diene



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

Flanged Full Lift Safety Relief Valves, spring loaded type 441, 442
Flanged Safety Relief Valves, spring loaded type 431, 433

1.1 Design: spring loaded, conventional and balanced design

Screwed cap H2 Packed lever H4 Plain lever H3	Type 441 (closed bonnet)	Type 433 (closed bonnet)
Plain lever H3	Type 442 (open bonnet)	Type 431 (open bonnet)
Opening characteristics	Safety relief valve Normal (liquids) Full lift (steam/gas)	Safety relief valve Normal (liquids, steam/gas)
Connection inlet/outlet	Flanged	Flanged
Standard pressure rating	Inlet: PN 16, PN 25, PN 40, CL150, CL300 Outlet: PN 10, PN 16, CL150	Inlet: PN 16, PN 25, PN 40, PN 160 Outlet: PN 16, PN 40

1.2 Technical characteristics:

- Type 441, 442 DIN

Valve size (mm)	DN 20	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200
Flow diameter do (mm)	18	23	29	37	46	60	74	92	98	125	165

- Type 441, 442 ANSI

Valve size ANSI (inch)	1" x 2"	1-1/2" x 2"	1-1/2" x 2-1/2"	2" x 3"	3" x 4"	4" x 6"
Flow diameter do (mm)	23	29	37	46	60	92

- Type 441, 442 XXL

Valve size (mm)	200	250	300	400
Valve size (inch)	8"	10"	12"	16"
Flow diameter do (mm)	165	200	235	295

- Type 431, 433

Valve size (mm)	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150
Flow diameter do (mm)	12	18	18	18	23	29	37	46	60	74	92

1.3 Material specification:

Type	4411 / 4421 4311 / 4331	4415 / 4425 4315 / 4335	4412 / 4422 4312 / 4332	4414 4334
Body	0.6025 (cast iron)	0.7043 (60-40-18)	1.0619 (WCB)	1.4408 (CF8M) 1.4571 (316Ti)
Bonnet	0.7040/0.7043 (60-40-18) 1.0619 (WCB)	0.7040/0.7043 (60-40-18) 1.0619 (WCB)	0.7040/0.7043 (60-40-18) 1.0619 (WCB) 1.0254	1.4408 (CF8M) 1.4404 (316L) 1.4571 (316Ti)
Disc	1.4122 (hardened stainless steel)	1.4122 (hardened stainless steel)	1.4122 (hardened stainless steel), 1.4404 (316L)	1.4404 (316L) 1.4571 (316Ti)
Seat	1.4404 (316L)	1.4404 (316L)	1.4404 (316L) 1.0305 stellited 1.0460 stellited	1.4404 (316L) 1.4571 (316Ti)

- Pressure-Temperature rating will comply with the manufacturer's recommendation

- Additional materials are applicable in accordance with Paragraph [4.5] of this certificate

2. DOCUMENTS AND DRAWINGS

- Manufacturer's catalogues
- Brochure LWN 482.01-E Type 441, 442, Edition September 2010
- Brochure LWN 485.01-E Type 431, 433, Edition April 2011
- Brochure LWN 488.01-E Type 441, 442, Full Nozzle, Edition August 2008
- EC type-examination (module B) Certificate No. 07 202 0111 Z 0008/0/08: Type 441, 442
- EC type-examination (module B) Certificate No. 07 202 0111 Z 0008/0/06: Type 431, 433

3. TEST REPORTS

- Safety Relief Valves Type 441, 442 are type tested in accordance with the provisions of Directive 97/23 EC.
- Safety Relief Valves Type 431, 433 are type tested in accordance with the provisions of Directive 97/23 EC.
- Test reports TÜV SV 09-576 and TÜV SV 08-577

4. APPLICATION / LIMITATION

4.1 May be used as a safety relief valve:

- for steam (except cap H₂), gases and liquids
- for cargo tanks and piping system on liquefied gas carriers

4.2 The safety relief valves belong to class I according to the relevant requirements stated in Part D, Ch 9, Sec 5 or to class I, class II or class III according to the relevant requirements stated in Part C, Chapter 1, Sec 10.

4.3 The max. steam production is to be in accordance with the manufacturer's specifications. The C-factor for ordinary/full lift safety valves will comply with Pt C, Ch 1, Sec 3 [3.2.2] of the Bureau Veritas Rules. The orifice diameter in way of the safety valve seat is not to be less than 40 mm. Where only one safety valve need to be fitted, the orifice minimum diameter is not to be less than 50 mm.

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 could be required by the Society to be additionally tested for their capacity in accordance with the Society's Rules and IGC Code.

4.5 Materials have to comply with table 6.4 of IGC Code and relevant requirements in BUREAU VERITAS Materials Rules.

4.6 When required in Part D, Ch 9, Sec 6 of the Bureau Veritas Rules applicable to liquefied gas carriers, Charpy V-notch impact test shall be carried out for castings. Castings in steel grades 316 and 316L at any temperature will be impact tested at -196 °C. A reduction may be granted for design temperature above -60 °C after examination by the Society.

4.7 The safety 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 Valves are to be manufactured, examined and tested by the manufacturer in accordance with the approved type described in this certificate and in accordance with BUREAU VERITAS Rules 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 units to be fitted on board ships classed with BUREAU VERITAS.

5.2 **LESER GmbH** 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.

5.3 Bureau Veritas Certificates are required for materials of valve housings of class I (DN ≥ 50) and class II (DN ≥ 100). Materials of valve housings of class I (DN < 50) and class II (DN < 100) and other pressure boundary parts of class I are to be with Work's certificates.

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

6. MARKING OF PRODUCT :

Each valve is at least to be permanently marked with:

- Manufacturer's name or logo
- Type designation
- Setting pressure
- Society's brand as relevant

7. OTHERS

7.1 This approval is given on the understanding that the Society reserves the right to require check tests to be carried out on the units at any time and that **LESER GmbH, Hamburg / GERMANY**, will accept full responsibility for informing shipbuilders, ship-owners or their sub-contractors of the proper methods of use and general maintenance of the units and the conditions of this approval.

7.2 This certificate supersedes the Type Approval Certificate 12263/A3 BV issued on 05/08/2011 by the Society.

*** END OF CERTIFICATE ***