




TYPE APPROVAL CERTIFICATE
No. MAC127415XG/001

This is to certify that the product identified below is in compliance with the regulations herewith specified.

<i>Description</i>	SAFETY VALVES
<i>Type</i>	441 - 442
<i>Applicant</i>	LESER GMBH & CO KG TECHNICAL DEPARTMENT WENDENSTRASSE 133-135 D-20537 HAMBURG GERMANY
<i>Manufacturer</i>	LESER GMBH & CO KG
<i>Place of manufacture</i>	ITZEHOER STRASSE 63-65 24594 HOHENWESTEDT GERMANY
<i>Reference standards</i>	RINA RULES FOR THE CLASSIFICATION OF SHIPS

Issued in **Hamburg** on **August 18, 2015**. This Certificate is valid until **August 17, 2020**


RINA Services S.p.A.
Giuseppe Russo

This certificate consists of this page and 1 enclosure



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Reference documents

- High Performance Catalog 1 Series 441, edition May 2012 Doc. No 0777.5465.
- VdTÜV-"Merkblatt" type test approval No.: 14-576 dated 03.2011 including pao/po and h/do curves.
- Manufacturer's Test report No. HAM 600226-1 dated 24.02.2010; EC type-examination certificate No.: 07 202 0111 Z 0008/0/08 Rev.3 dated 29.06.2010
- TÜV Nord Design Examination Report No STK1P0598001

- Valve drawings:

-Valve size	DN 20	Leser drawing number	350-4109
-Valve size	DN 25	Leser drawing number	350-1209
-Valve size	DN 32	Leser drawing number	350-1309
-Valve size	DN 40	Leser drawing number	350-1409
-Valve size	DN 50	Leser drawing number	350-1509
-Valve size	DN 65	Leser drawing number	350-1609
-Valve size	DN 80	Leser drawing number	350-1709
-Valve size	DN 100	Leser drawing number	350-1809
-Valve size	DN 125	Leser drawing number	350-4709
-Valve size DN 150	Leser drawing number 350-6409		
-Valve size DN 200	Leser drawing numbers: 351-3409; 107-2909 (weld), 107-2609 (cast), Approved Drawings with Nos.4295079, 4294923-926 on 02/09/1992.		
-Valve size DN 250	Leser drawing numbers: 351-3509 and 107-3009, Approved Drawings with Nos.4295080, 4294927-930 on 02/09/1992		
-Valve size DN 300	Leser drawing number 351.3709 and 107.3109 Approved with no. MAC-15154 on 14/06/2005.		
-Valve size DN 400	Leser drawing number 351.3809 and 107.3209 Approved Drawings with no. MAC-15155 on 14/06/2005.		

Materials/Components

As listed in the above mentioned Leser catalogue and subject to the limitations indicated on the certificate, as appropriate.

Technical characteristics

- Valve sizes:
 - Sizes:DN20, 25, 32, 40, 50, 65, 80, 100, 125, 150, 200 (PN40 ; CL300).
 - Sizes:DN200, 250, 300, 400 (PN25 ; CL150 - CL300).
 - Sizes:1" up to 4" ANSI (CL150 - CL300).
- Max working pressure and temperature range:
 - Max inlet /outlet pressure: as indicated in the a.m. catalogue and/or in the tables of the a.m. type test report TÜV Nord No. SV14-576 dated 03.2014, as appropriate.
 - Temperature range (for different body materials):
 - Types 4411/4421 0°C to +220°C for GG-25 (0.6025) (see "limitations" on the certificate)
 - Types 4415/4425 0°C to +350°C for GGG-40.3 (0.7043) and SA 395
 - Types 4412/4422 -10°C to +450°C for GP 240 GH (1.0619) (*)
 - Types 4412/4422 -10°C to +450°C for C22.8 (1.0460), P265GH (1.0425), St 35.8 (*)
 - Types 4412/4422 -29°C to 427°C for SA 216 WCB
 - Types 4414 -196°C to + 400°C for GX5CrNiMo19-11-2 (1.4408) (*)
 - Types 4414 -196°C to 300°C for SA 351 CF8M
 - Types 4414 -196°C to 300° for X6CrNiMoTi 17-12-2 (1.4571) and 316Ti (*)

Note:

Notwithstanding the above, if the temperature range indicated on the table 1 of the a.m. type test report TÜV Nord No.SV14-576 dated 03.2014 is different from the temperature range referred above for the materials marked with (*), in such a case, the said range and associated pressure/valve size indicated therein is to be appropriately considered in the selection of the correct application for the valve.

- Other characteristics: as per a.m. Leser catalogue, as appropriate.

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Fields of application

Boilers, pressure vessels and piping for steam, liquids and gases including LPG/LNG applications.

Limitations

- The valves with gastight cap type **H2** are not approved for use on steam boilers.
- The valves with open bonnet lifting devices **H3** are not to be used on RINA classed ships. Only valves with closed bonnet type are permitted.
- The valves in grey cast iron (GG-25) are subject to the limited applications, due to design pressure/temperature and medium discharged, which are to fully comply with the pertinent RINA Rule requirements (see also Table 4 of Part C, Ch. 1, Sect. 10).
- Impact test for carbon steel intended for design temperature 0°C or higher : **27J** at +20°C.
- For design temperatures below 0°C the valve materials are to have the following minimum impact test values:
 - Carbon steel **27J** at 5°C below the design temperature or -20°C, whichever is lower;
 - Stainless steel **41J** at -196°C.

Acceptance conditions

- The values of discharge flow coefficient α_w , corresponding to RINA coefficient **Z**, which depends on the ratio h/d_o between the actual lift and the orifice diameter in way of the seats and on the ratio p_{a0}/p_o between the absolute pressures downstream and upstream of the valves themselves, are as per VdTÜV-Merkblatt SV14-576, above.
Said values appropriately selected on a basis of intended fluid (steam, gases and liquids) in question, will be considered by RINA to determine, when required, the discharge capacities of the valves.
In particular, in the case of valves intended for boilers, the relevant discharge capacities are to be calculated according to the formula contained in Paragraph 2.3.2 of Part C Chapter 1 Section 3 of the RINA Rules using the above mentioned value of **Z** and the ratio $d/h = 4$.
- The valves are to be equipped with the springs foreseen by the Leser specifications for the intended set pressure.
- The actual lifts are those corresponding to the above accepted values, as indicated in your a.m. catalogue.
- The materials are to be suitable for the intended pressure, temperature and medium discharged.
- For ships where IGF Code is applicable Approval will be given case by case.

Remarks

- The installation to be in accordance with manufacturer's specification and recommendation.
- This Certificate annuls and replaces the previous Type Approval Certificate No. MAC071010XG.

Hamburg August 18, 2015

