



**TYPE APPROVAL CERTIFICATE**  
No. MAC009712XG

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

<i>Description</i>	<b>SAFETY VALVES</b>
<i>Type</i>	<b>459/459 HDD &amp; 462/462 HDD</b>
<i>Applicant</i>	<b>LESER GMBH &amp; CO KG (QMP / ABN DOKU) WENDENSTRASSE 133_135 D_20537 HAMBURG (GERMANY)</b>
<i>Manufacturer</i>	<b>LESER GMBH &amp; CO KG (QMP / ABN DOKU)</b>
<i>Place of manufacture</i>	<b>ITZEHOER STRASSE 63_65 D_24594 HOHENWESTEDT (GERMANY)</b>
<i>Reference standards</i>	<b>RINA RULES FOR THE CLASSIFICATION OF SHIPS</b>

Issued in **HAMBURG** on **February 7, 2012**. This Certificate is valid until **February 6, 2017**

RINA  
**Daniele Chirulli**

This certificate consists of this page and 1 enclosure



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**459/459 HDD & 462/462 HDD**

**Reference documents**

- Leser catalogue LWN 481.01-E for safety valves type 459/459 HDD and 462/462 HDD:  
pages 05/02 to 05/20 (type 459); pages 06/02 to 06/18 (type 459 HDD);  
pages 07/02 to 07/20 (type 462); pages 08/02 to 08/18 (type 462 HDD).

- Leser drawing numbers:

351.4309-05-B02, 351.4309-04-B03, 351.4309-00-B06, 351.4309-09-B01,  
351.4409-06-B01, 351.4409-03-B02.

- EC type examination (module B) certificate no.:07 202 0111 Z 0008/0/13 Rev.1  
dated 29.06.2010;

- VdTÜV- "Merkblatt" type test approval No.: 07-909 dated 10.2007.

- Manufacturer's test reports no. HAM600226-1 dated 24.02.2010

**Materials/Components**

Part / Type	4593 / 4623	4592 / 4622	4594 / 4624	4594 / 4624 HDD
Body	0.7043 / 60-40-18	1.0619 / WCB 1.4404 / 316L	1.4404 / 316L 1.4408 / CF8M	1.4404 / 316L
Inlet	1.4104 / 430 or 1.4404 / 316L	1.4404 / 316L		1.4404 stellited / 316L stellited or 1.4404 / 316L
Temperature range [°C]	-10 to +300	-85 to +450	-196 to +400	-196 to +400

**Technical characteristics**

Design: Angled type, direct spring loaded

Disc seat: Metal (459, 459 HDD)  
Soft seal (462, 462 HDD)

Connections: Flanged or Threaded

Opening characteristic: Full lift safety valve for steam and gases  
Standard safety valve for liquids

Lifting device: Packed lever H4  
Plain lever H3  
Cap (gas tight) H2



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**459/459 HDD and 462/462 HDD**

Feature / Type	459 / 462			459 HDD / 462 HDD		
$d_o$ [mm]	9	13	17,5	6	9	13
Inlet size	threaded: ½" – 2" flanged: DN 15 – DN 40			threaded: ½" – 1¼" NPS ½" – NPS 1½"		
Outlet size	1" - 2" flanged: DN 25 – DN40			1" - 1½" NPS 1" – NPS 1½"		
Pressure rating (DIN / ANSI)	PN 40 – PN 400 / #150 - #2500					
inlet	PN 500	PN 250	PN 160	PN 700, PN 850	PN 500	PN 250
outlet	PN 40			PN 160		
Set pressure range [bar]	0,5 to 420	0,1 to 250	0,2 to 140	200 to 850	0,5 to 420	0,1 to 250

### **Fields of application**

- Steam, liquids and gases (including LPG/LNG services)
- Pressure vessels and pipings (excluding boilers and steam generators).

### **Limitations**

- The valves with threaded connections are allowed ONLY for gas carrier service operating to a working temperature higher than - 55°C.
- The valves with threaded connections (parallel or tapered thread) are to be used on piping systems according to limitations stated in Table 15 Part C Chapter 1 Section 10 of RINA Rules.
- The valves with open bonnet lifting devices **H3** are not to be used on RINA classed ships.
- For temperatures above 50°C the maximum working pressure has to be reduced taking into account the actual yield point as per material standard.
- Use of spheroidal graphite cast iron is allowed according to limitations stated in Table 4 Part C Chapter 1 Section 10 of RINA Rules.

### **Acceptance conditions**

- The following flow coefficient **Z**, depending on the ratio  $h/d_o$  between the actual lift and the orifice diameter in way of the seat, on the ratio  $p_{ao}/p_o$  between the absolute pressures downstream and upstream of the valves themselves, is accepted by RINA to determine the discharge capacities of the valves:



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459/459 HDD and 462/462 HDD

**Steam and gases**

Nominal size	Z	h/do	p <sub>ao</sub> /p <sub>o</sub>
DN10 (do=6) (type 459)	0.81	≥ 0.19	≤ 0.40
DN15 (do=9)	0.83	≥ 0.19	≤ 0.40
DN15 (do=13)	0.81	≥ 0.19	≤ 0.40
DN20	0.79	≥ 0.19	≤ 0.40

**Liquids**

Nominal size	Z	h/do
DN10 (do=6) (type 459)	0.7	≥ 0.17
DN15 (do=9)	0.61	≥ 0.19
DN15 (do=13) (type 459)	0.53	≥ 0.19
DN15 (do=13) (type 462)	0.61	≥ 0.19
DN20	0.52	≥ 0.19

- 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.
- The materials are to be suitable for the intended pressure, temperature and medium discharged.
- The acceptance of the above mentioned products on board a ship and other units classed with RINA is subject to the satisfactory outcome of testing as per RINA Rules.
- Unit production testing for valves intended for liquefied gas carriers is to be in accordance with Part E Chapter 9 Section 5 of RINA Rules.
- The installation is to be in accordance with manufacturer's specification.

*This Certificate annuls and replaces the previous Type Approval Certificate No. MAC476406CS/001 dated 07/02/2007.*

HAMBURG February 7, 2012


