

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Safety Valve for Pressure Vessel**

with type designation(s)  
**437, 438, 439**

Issued to

**Leser GmbH & Co. KG**  
**Hamburg, Germany**

is found to comply with

**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**  
**DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment**  
**DNV GL class programme DNVGL-CP-0186 – Type approval – Valves**

## Application :

**Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**

**K. factor: Ref. to certificate**

Issued at **Hamburg** on **2018-02-27**

This Certificate is valid until **2023-02-26**.

DNV GL local station: **Hamburg**

for **DNV GL**

Approval Engineer: **Hagen Markus**

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**Olaf Drews**  
**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.



## Product description

Safety Relief Valve, spring loaded.

|           | Valve types                                                              |                                       |                                                  |
|-----------|--------------------------------------------------------------------------|---------------------------------------|--------------------------------------------------|
|           | 437                                                                      | 438                                   | 439                                              |
| Design    | Conventional design and long version with threaded and flange connection |                                       |                                                  |
| Disc seal | Metal seat                                                               | Soft seal<br>NBR, CR, EPDM, FKM, FFKM | Vulcanized soft seal<br>NBR, CR, EPDM, FKM, FFKM |
| Cap types | H2 – gas tight                                                           |                                       |                                                  |
|           | H3 – pull button                                                         |                                       |                                                  |
|           | H4 – manual lifting device (packed knob)                                 |                                       |                                                  |

## Sizes and maximum set pressure

k-

|                               |                                           | Valve types                            |                                                      |             |            |
|-------------------------------|-------------------------------------------|----------------------------------------|------------------------------------------------------|-------------|------------|
|                               |                                           | 437                                    | 437                                                  | 438         | 439        |
| d <sub>0</sub> [mm]           |                                           | 6                                      | 10                                                   |             |            |
| Inlet size                    |                                           | threaded: 3/8" to 1"                   |                                                      |             |            |
|                               |                                           | flanged: DN15 – DN25 / NPS ½" – NPS 1" |                                                      |             |            |
| Outlet size                   |                                           | threaded: ½" to 1"                     |                                                      |             |            |
|                               |                                           | flanged: DN15 – DN25 / NPS ½" – NPS 1" |                                                      |             |            |
| Inlet                         |                                           | PN400                                  | PN250                                                |             |            |
| Outlet                        |                                           | PN160                                  |                                                      |             |            |
| Pressure rating<br>DIN / ANSI |                                           | PN40 - 400 / CL150 - CL2500            |                                                      |             |            |
| Set pressure range<br>[bar]   |                                           | 0,10 to 400                            | 0,10 to 180                                          | 0,10 to 180 | 0,10 to 16 |
| Valve type                    | ASME Section VIII, Div 1<br>Flow Capacity |                                        | DGRL / DIN EN ISO 4126-1<br>coefficient of discharge |             |            |
|                               | Steam /<br>Gases                          | Liquids                                | Steam /<br>Gases                                     | Liquids     |            |
| 437, d <sub>0</sub> = 6       | -                                         | -                                      | 0,72                                                 | --          |            |
| 437, d <sub>0</sub> = 10      | 1,020                                     | 1,540                                  | 0,50                                                 | 0,350       |            |
| 438, d <sub>0</sub> = 10      | 0,904                                     | 1,020                                  | 0,40                                                 | 0,330       |            |
| 439, d <sub>0</sub> = 10      | 0.904                                     | 1,020                                  | 0,45                                                 | 0,370       |            |

factors

## Sizing of pressure relief valves

In addition to the sizing tables specified in LESER product catalogue, Doc. No. 0777.5489, applicable DNV GL Rules are to be observed.

For application on pressure vessel refer to DNV GL Pt.4, Ch.7, Sec.5.

## Material and temperature range

|                          | Valve types                                                       |                               |                                                 |                                  |                         |
|--------------------------|-------------------------------------------------------------------|-------------------------------|-------------------------------------------------|----------------------------------|-------------------------|
|                          | 4373                                                              |                               | 4374                                            | 4383 / 4393                      | 4384 / 4394             |
| d <sub>0</sub> [mm]      | 6                                                                 | 10                            | 6 and 10                                        | 10                               | 10                      |
| Outlet body              | 1.4104<br>SA 479 430                                              |                               | 1.4404<br>SA 479 316L                           | 1.4104 or 1.4404/<br>SA 479 316L | 1.4404 /<br>SA 479 316L |
| Inlet body               | 1.4404<br>SA 479 316L                                             | 1.4104, 1.4404<br>SA 479 316L | Standard 1.4404,<br>SA 479 316 and<br>stellited | 1.4104 or 1.4404/<br>SA 479 316L |                         |
| Disc                     | 1.4404 and 316L stellited,<br>1.4122, hardened stainless<br>steel |                               |                                                 | 1.4404 / 316L                    |                         |
| Temp. range <sup>1</sup> | -55°C to<br>+400°C                                                | -10°C to<br>+400°C            | -165°C to +400°C                                | -10°C to +220°C                  | -165°C to<br>+280°C     |

### Notes

<sup>1</sup> Refer to "Application"

## Requirements depending on pipe classes and application

The requirements on the safety relief valve design, material grades and certificates of pressurised parts as well as the scope and requirements of production testing depends on the application and pipe class. The following DNV GL Rules are to be observed:

- DNV GL Pt. 2, Ch. 1, Sec. 2 (Approval of material manufacturers)
- Ch.2, Sec. 8 – 5 Castings for boilers, pressure vessels and piping systems
- Sec. 8 – 7 Stainless steel castings
- DNV GL Pt. 4, Ch. 6, Sec. 1 – Table 1 (pipe classes)
- Sec. 1 – Table 4 (Certification requirements)
- Sec. 2 – Table 3 (material certificates acc. to pipe classes)

In addition, for pressure vessels application

- DNV GL Pt.4, Ch. 7, Sec.1 - General Requirements
- Sec.2 - Materials
- Sec.3 – Thermal - oil installations
- Sec.7 – Manufacture, workmanship and testing

## Application

The safety relief valves of type 437, 438 and 439 are type approved for application in piping systems and on pressure vessels as specified in the Rules Pt.4 Ch.6 Piping Systems and Pt.4, Ch.7 Pressure equipment.

## Limitation

The valve types 437, 438 and 439 are not approved for installation on steam boiler.

Valves with threaded pipe connection are not approved for installation in piping systems conveying flammable or toxic media. For these applications, the flanged version is to be used. Refer to Pt.4, Ch.6 – Section 9 – 5 Detachable pipe connection.

Application in fuel gas systems is subject to separate approval for each installation.



Job Id: **262.1-008264-5**  
Certificate No: **TAP0000173**

## **Type Approval documentation**

### **Tests carried out**

#### **Production testing**

Each relief valve is subject to production testing according to applicable DNVGL Rules as follows:

- Machinery piping systems Pt.4, Ch 6, Section 9 - 3 Valves
- Steam boilers, steam generators and pressure vessels Pt.4, Ch.7 – Section 7 – 4.6 Hydraulic test

Appropriate DNV GL product certificate to be issued, if required by the Rules.  
Reference is made to Recognition Certificate MSARC0000ATE.

## Marking of product

For traceability to this type approval certificate each valve is to be provided with a name plate with at least the following data:

|                                        | Example   |
|----------------------------------------|-----------|
| Manufacturer's name or trade mark      | LESER     |
| Type designation                       | 437 – H2  |
| Nominal pressure rating Inlet          | PN400     |
| Size inlet / outlet                    | DN15      |
| Diameter $d_0$ [mm]                    | 6         |
| Set pressure                           | 180bar    |
| Coefficient of discharge $K_D$ / Media | 0.904 S/G |

## Periodical assessment

For retention of the type approval certificate periodical assessments shall be carried out at production places by DNVGL surveyor.

The objective of the periodical assessment is to verify that the design and production conditions for the type approval have not been altered.

Main scope of the assessment:

- verification of the production and quality control system
- review of quality control documentation of recent deliveries
- review of drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

## End of connection