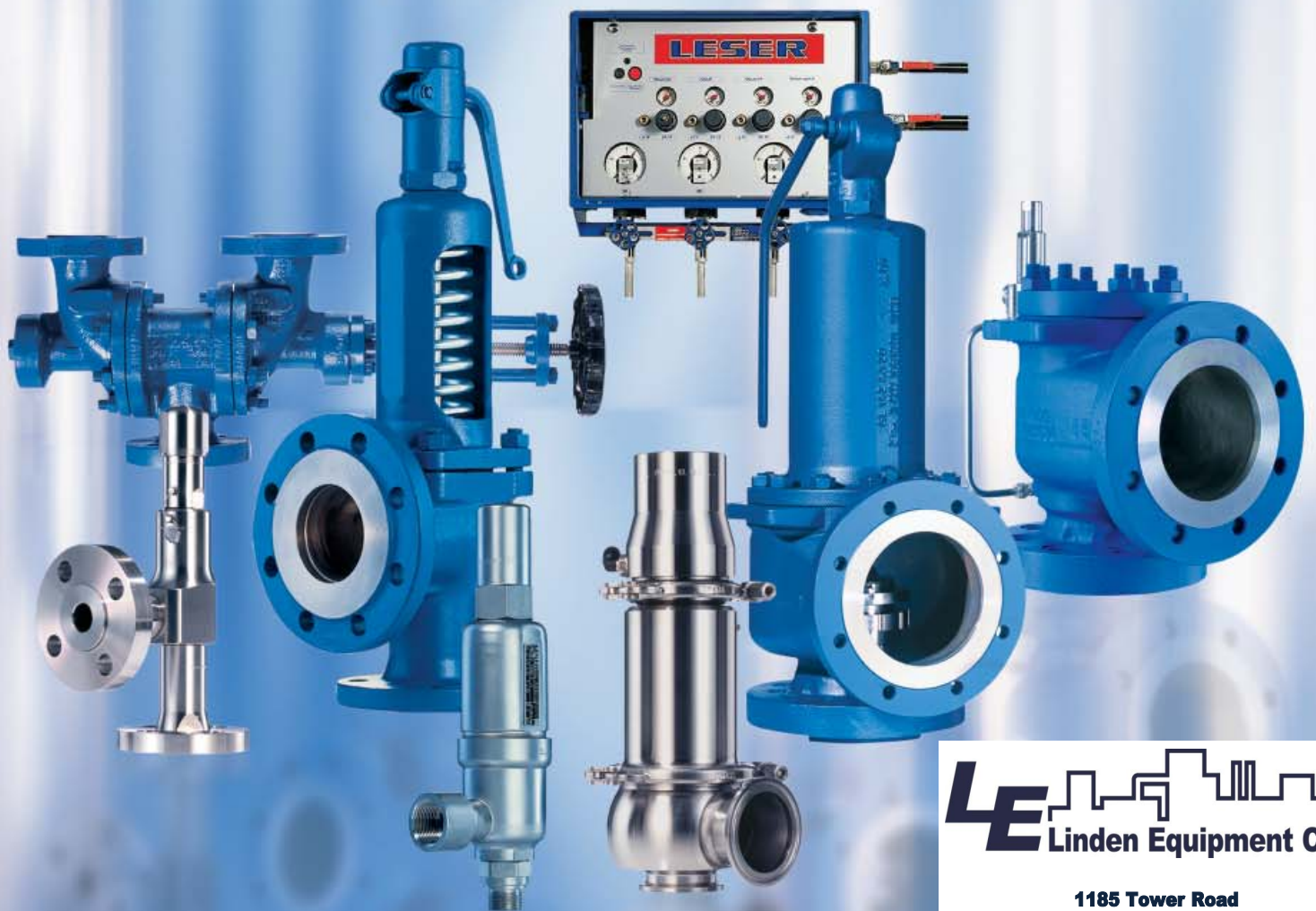


LESER at a glance



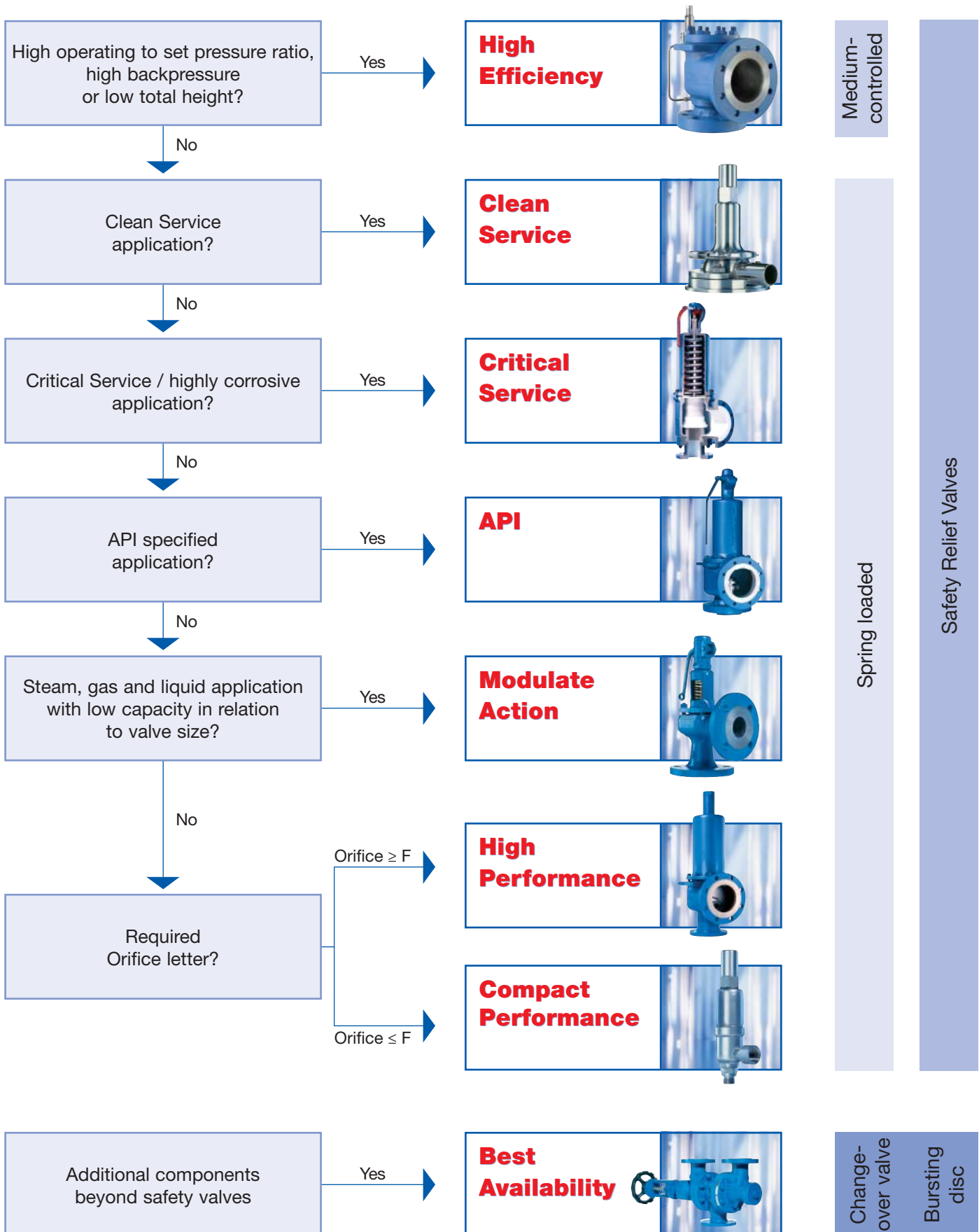
LE Linden Equipment Co.

1185 Tower Road
Schaumburg, IL 60173
Ph: 847.885.0300 Fax: 847.885.0303
lindenequipment.com

LESER

The-Safety-Valve.com

Product Group



Process and General Industrial Safety Valves

API

meets all requirements of the API 526 norm and includes the entire orifice D to T product range.



Type 526

Series 526

Applications

- Refineries
- Chemical industry
- Petrochemical industry
- Oil and gas – Onshore and Offshore

Product features

- Valve sizes 1" through 8", Orifice D through T
- Materials: WCB, CF8M, WC6, LCB, specials
- Design according to API 526
- Great variety of options and flanged connections available
- Standard metal sealing
- Single trim for steam, gas and liquid

Compact Performance

has compact dimensions with a large performance range for its valve size.

Series 437, 459

Applications

- Thermal relief
- Air/gas compressors and pumps
- Technical gases and CO₂ plants
- LPG/LNG terminals, carriers etc.
- Chemical equipment and piping
- Cryogenic systems and oxygen applications

Product features

- Great variety of threaded or flanged connections
- Valve sizes from 3/8" through 1 1/2"
- Broad set pressure range up to 800 bar / 11600 psig
- Wide range of materials and options to fit any application
- Stellite metal sealing for longer product life
- Soft seat for superior tightness
- Single trim for steam, gas and liquid



Type 437

Type 459

High Performance

is especially used for protecting facilities where maximum discharge capacity needs to be reached quickly.

Series 441, XXL, 444, 441 Full nozzle, 458

Applications

- Heat exchanger
- Chemical equipment and piping
- General steam installations
- All industrial applications independent from the medium
- Air/gas compressors and pumps

Product features

- Great variety of types, materials and options to fit any application
- Valve sizes from DN 20 through DN 400, 1" through 16"
- Flange connections according to DIN EN, ASME and other
- High capacity compared to the API requirements
- Standard metal sealing
- Single trim for steam, gas and liquid



Type 441

Specialties

Clean Service

has the highest aseptic characteristics, has minimum dead space, and allows easy cleanability.



Series 48x

Applications

- Pharmaceutical industry
- Breweries
- Food and beverage industry
- Cosmetic industry

Product features

- Valve sizes DN 25 through DN 100, 1" through 4"
- Great variety of aseptic connections (e.g. clamps, flanges) and option to fit any application
- Materials: Stainless steel 316L, 1.4404, 1.4435 and specials
- Minimum dead leg design and flush-mounting capability
- Soft seat (FDA compliant elastomers) for superior tightness
- Gap and crevice free design of internals
- Elastomer bellows for protection of the hard to clean parts
- Surface grades according to ASME BPE-2002 and DIN 11866
- Single trim for steam, gas and liquid

Critical Service

offers solutions for protection from highly corrosive and toxic mediums.

Series 447, **PTFE-lined** 546, 449

Applications

- Corrosive or aggressive chemicals
- Chemical equipment and piping
- Chlorine manufacture and processing
- Reducing acids (e.g. hydrochloric acid, acetic acid)
- Alkalis or caustic service
- MDI systems

Product features

- Valve sizes DN 25 through DN 100, 1" through 4"
- Flange connections according to DIN EN, ASME and other
- Body is resistant against most chemicals by special coating
- PTFE lining or special metals
- A PTFE or metal bellows protects the bonnet area against product influences
- Smooth inside surface avoid adherence of corrosive matters
- Single trim for gas and liquid



Type 447

Modulate Action

offers solutions for applications with normal and /or proportional opening characteristics (e.g. thermal expansion).



Type 429

Series 429, 433

Applications

- Thermal expansion
- Reciprocating compressors and plants with pulsating operating pressure
- Heat transfer oil systems
- Protection of liquids
- Overflow operation
- Mechanical engineering (OEM)

Product features

- Great variety materials and options to fit any application
- Valve sizes DN 15 through DN 150, 1/2" through 6"
- Flange connections according to DIN EN, ASME and other
- Low overall height and low weight
- One connection size for inlet and outlets
- Single trim for gas and liquid

Medium controlled

Increase the efficiency of your plant by using

- Higher operating pressure than is possible with regular spring-loaded safety valves, as High Efficiency safety valves guarantee tightness right until set pressure.
- Lower media loss during blow-off because High Efficiency safety valves have low opening and reseating pressure differences.
- Safe operation irrespective of back pressure due to the fact that back pressure has no influence on the opening characteristics of High Efficiency safety valves

High Efficiency



Series 800 – Pilot Operated Safety Valve

Applications

- Oil and gas production, onshore, offshore
- Refinery (Oil and gas processing)
- Gas distribution

Product features

- Valve sizes DN 25 through DN 200, 1" through 8", Orifice D through T
- Materials: 1.0619, 1.4408, WCB, LCB, CF8M
- Full bore for higher capacity based on nominal size.
- Internal tubing means: No leakage, no freezing
- Backflow preventer as standard reduces cost and eases ordering

High Efficiency

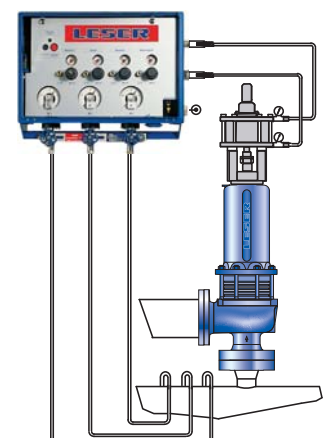
Series 700 – Supplementary Loading System

Applications

- Steam producers
- Paper mills
- Sugar refineries

Product features

- Adjustable opening and reseating pressure difference for adjustment to plant situation.
- Decoupling of control system and safety valve, this means that safety valves with supplementary loading can also be used under extreme conditions such as e.g. temperatures above 500 °C or contaminated fluids.
- The triple redundancy of pressure tapping and regulation guarantees the maximum possible reliability.
- The Series 700 can also be fitted to competitor safety valves to ensure a stable system operation.



Additional components

Change-over valves are used to connect two safety valves to a pressure system. One safety valve is in operation and the other one is on standby. The safety valve on standby can be dismantled and serviced during ongoing operation of the system – the protection of the system against excessive pressure remains guaranteed.

Best Availability

Type 310 and 311 XXL – Change-over Valves

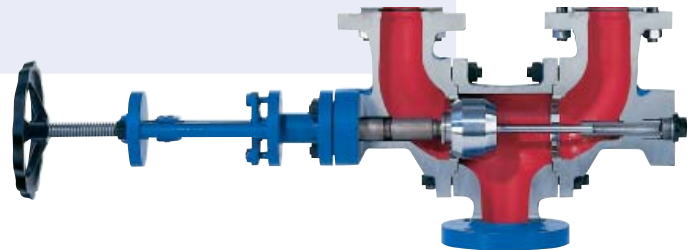
Applications

Change-over Valves are used in plants which cannot or should not be switched off such as:

- Storage tanks for industrial gas
- Bitumen plants
- Oil fields
- Ethylene plants
- Refineries

Product features

- Uninterrupted operation
- Simple handling
- Heavy-duty design



The combination of a LESER safety valve and bursting disc combines the advantages of both safety devices.

Best Availability

Series 350 – Safety Valve – Bursting Disc combination

Applications

The combination of bursting disc and safety valve is the solution for the following applications:

- Protection of the safety valve from corrosion or coatings.
- Protection from operating conditions which could impair the functionality of the safety valve.
- Safeguarding of the process with the highest possible tightness.
- To prevent a complete media loss after the bursting of the bursting disc.
- Avoidance of an uncontrolled shut down of a plant after the bursting of the bursting disc.
- To achieve cost advantages for aggressive media.

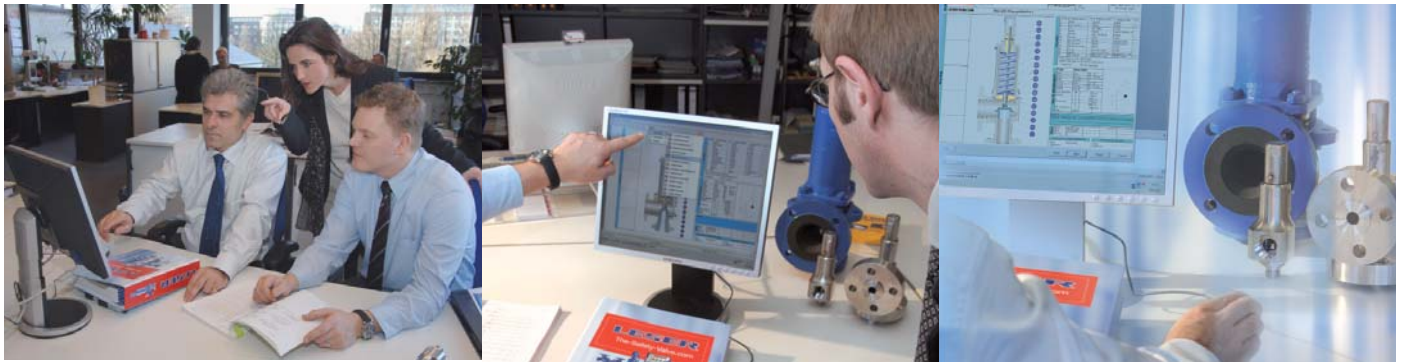
Product features

- Conformance to highest tightness requirements.
- Combination of advantages of safety valve and bursting disc in TÜV certified connection.
- Controlled operation after bursting of bursting disc





The sizing software for safety valves



VALVESTAR®, the sizing program for safety valves developed by LESER, supports all leading worldwide codes and standards. In addition to calculations and sizing the program provides user designed and configurable individual reports for technical documentation and archiving.

Program highlights

Sizing:

- Sizing of safety valves according to leading worldwide codes and standards such as: API 520, ASME VIII, ISO 4126, AD 2000-Merkblatt A2
- Calculation of two-phase flow in accordance with API 520 Appendix D (Ω -method) and fire case in accordance with API 521
- Evaluation of inlet pressure drop, built-up back pressure in pipework, reaction forces as well as noise levels

Reports:

- Selectable report types, e.g. project report, single page report
- Customisable design of report layouts (company logo, address etc.)
- Range of data export formats, e.g. XLS, RTF, PDF, etc.
- Integrated material part lists and sectional drawings for all LESER safety valves

Design and handling:

- A user friendly Wizard function leads step-by-step through the calculations
- Microsoft .Net based architecture offers latest graphical user interface for easy handling and enhanced performance

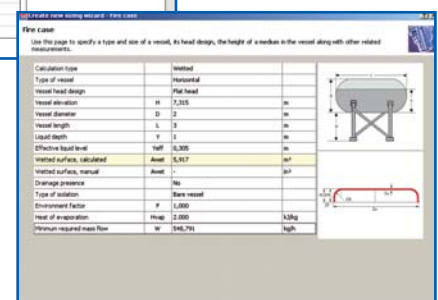
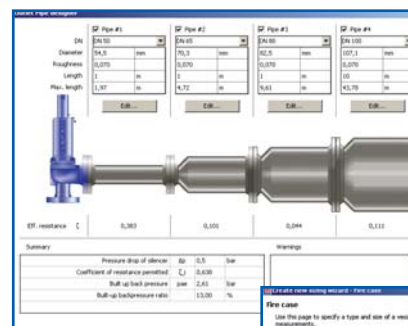
Settings:

Customisable user interface:

- User specified profile settings with preselection of units, calculation methods etc.
- More than 15 languages selectable

VALVESTAR® Web:

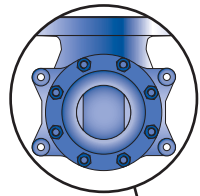
- Online-calculation for safety valves and projects at www.valvestar.com without any software installation



Flanged Safety Relief Valves

LESER safety relief valves have been optimized, in close cooperation with plant engineers and service specialists, simplifying design with fewer components for less down time, fewer spare parts and lower maintenance costs.

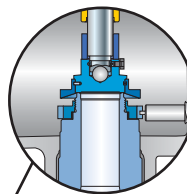
Integral cast support brackets for safe handling of the valves (API and heavy safety valves).



One piece spindle allows better alignment.

Guiding: Upper and lower guiding with small surface areas help reduce friction, a major cause of galling.

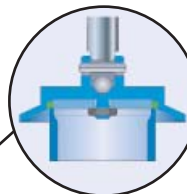
Long spring allows large pressure range for each spring thus drastically reducing the overall number of different springs.



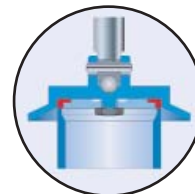
Single trim for steam, gas and liquids for fewer spare valves in your stock.

Stellited or hardened metal sealing for longer product life.

Soft seat solutions for superior tightness
O-ring or sealing plate design



O-ring

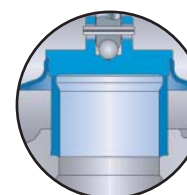


Sealing plate

LESER defines the set pressure as **“initial audible discharge”** (not “pop”). This avoids damage to valve seats during set pressure testing and allows for higher shut-off closer to set point.

Self-draining body avoids residue build-up and reduces corrosion.

API: Full nozzle design

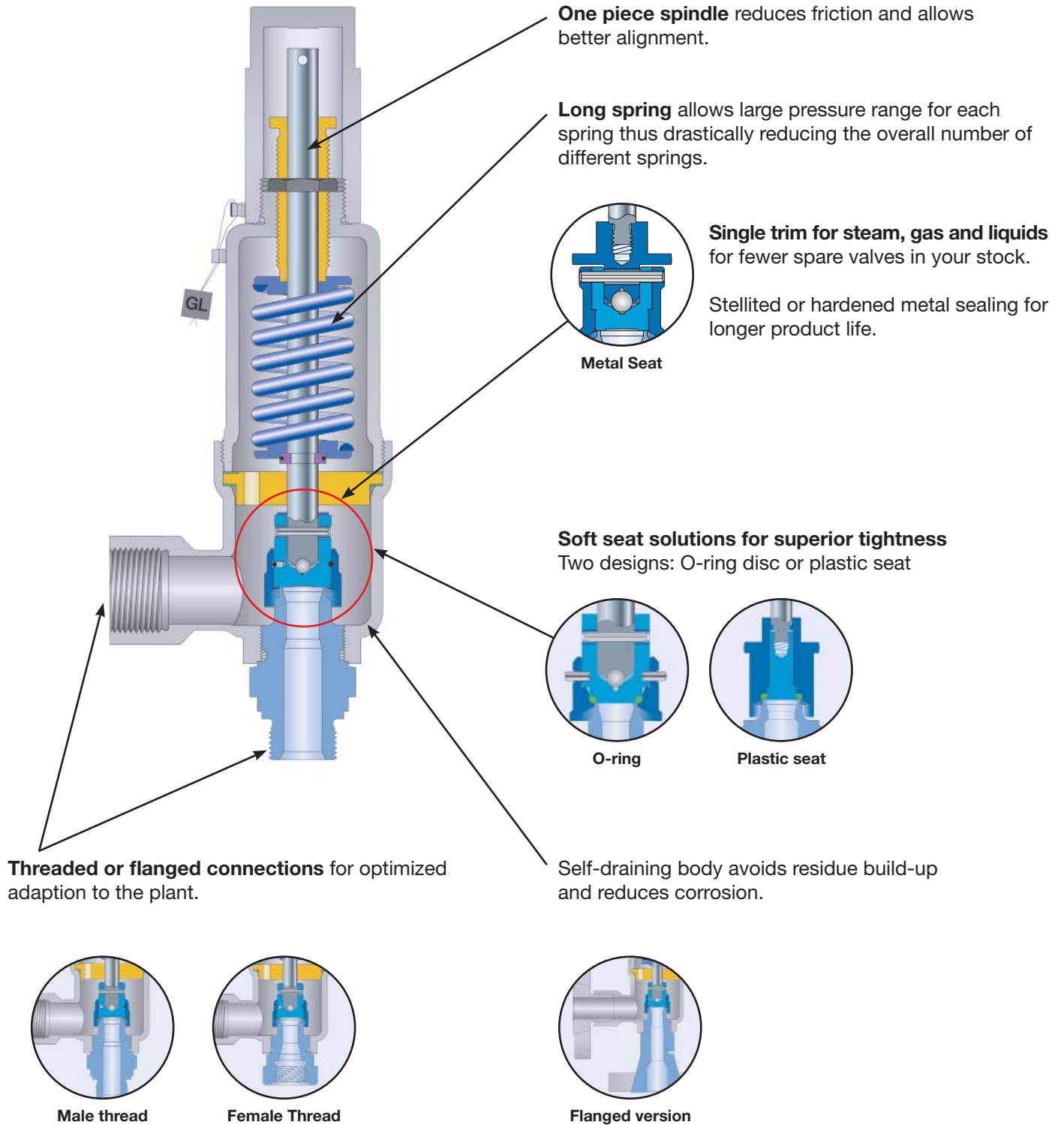


High Performance:
Semi nozzle – full bore – design

Options

LESER's safety relief valves can be customized with a great variety of options. For further information please refer to “Available options” of each Type.

Compact Performance Safety Relief Valves



Threaded connections male or female acc. to NPT ANSI/ASME B1.20.1. Threads according to other standards, e.g. ISO, DIN, BSP are also available.

Flanged connections acc. to ANSI/ASME B16.5. Flanges acc. to other standards, e.g. ISO, DIN, JIS are also available.

LESER GmbH & Co. KG

With approximately 600 employees, LESER is the largest European and one of the worldwide leading producers of safety valves. LESER safety valves are developed for the international market at our headquarters in Hamburg and tested on our certified test stand. Production, with a capacity of over 130,000 valves a year, takes place at our modern factory in Hohenwestedt. Eight subsidiaries in Europe, America, the Middle East, and Asia, as well as authorized and trained representatives in over 80 countries guarantee competent consulting for all industrial applications.

LESER safety valves protect people and the environment in the chemical, petrochemical, industrial gases, oil and gas production, and machine building branches, as well as the food and pharmaceutical industries.

In addition, FAINGER LESER in India produces safety valves for the local market.



All LESER Safety Valves carry CE and ASME



Corporate Vision

In the “world of safety valves” and their applications we are developing LESER into a responsive partner for our customers.

Due to our worldwide activities we are experiencing steady growth.

Commitment, Integrity and Tradition are the foundation of our company.

Time line

1885

Complete range of steam fittings, incl. safety valves

1957

First test lab for safety valves

1980s

Leading supplier for safety valves in Europe

1994

Test lab receives ASME certification (first and only outside of the US)

2003

Launch of the API Series



1818

Founded as a brass foundry in Hamburg, Germany

1943

Destruction of the plant, relocation and founding of new factory in Hohenwestedt, Germany

1970s

Specialization in safety valves

1990

First ASME approval

1998

First subsidiary founded

2010

Launch of the Pilot Operated Safety Valve

7 good reasons to use LESER safety valves

1

Availability

LESER is known for short response and short delivery times.

This is secured by the factory as well as by the 26 central warehouses worldwide and 66 LESER authorized repair centers (LARCS).

Unlike the competitors LESER keeps a high stock of raw material ready. This fact together with a high degree of vertical integration allows quick deliveries within 3 days as well as fast track within 24 hours for all standard safety relief valves.

2

Global Player

LESER's sales network is present in all core markets around the world.

This enables LESER to act as a local provider, having fundamental knowledge of the local market, the cultural environment and understanding the customers.

The local LESER Product Champion is key to this knowledge.

LESER offers documentation and catalogs in 15 different languages to assist the customer with the selection and sizing.

3

Product Range

LESER's product range includes 8 product groups with altogether 40 safety valve types.

This means that LESER's product range offers the right product for almost every application. Multiple options and special materials complete the range as well as client-specific solutions. All safety valves have the necessary certifications for worldwide applications.

As a partner LESER offers a complete knowledge in all ranges of possible applications of safety valves and is well established in the PED and the ASME field.

4

Quality

LESER's strength is based on advanced advisory skills and support services as well as excellent product and service quality.

Modern manufacturing methods, testing facilities for air, liquids and steam (ASME and PED approved), standardized and controlled processes as well as motivated and highly qualified employees ensures LESER a great competitive advantage.

LESER's quality management disposes of multiple certifications and supervises all steps of development, engineering and manufacturing.

LESER Safety Relief Valves are unique in design and are exclusively manufactured in Germany. The final assembly is mainly carried out locally. A product 100% made in Germany can also be provided.

6

Reliability

The reliability of LESER and its products is an inherent part of the corporate philosophy.

This philosophy is characterized by high compliance with confirmed delivery dates, sustainable actions, highest quality as well as reinvestments of more than 16 Mil. € in the past few years in production facilities and the company in general.

All safety valve series are thoroughly engineered and routinely undergo exhaustive checks in LESER's own TÜV and ASME-certified test laboratory.

This is how LESER can offer a consistently high quality of products and services to the customer.

5

Sustainability

LESER looks back on a history of over 190 years and is one of the first manufacturers of safety valves worldwide.

The company is family owned for the past 5 generations. 100% of the shares are family-owned.

The LESER family reinvests continuously in state-of-the-art machinery and raw material stocks to keep ahead on future standards.

This trust in LESER and its products is proved by a world-wide installed base of more than 1.000.000 safety valves.

7

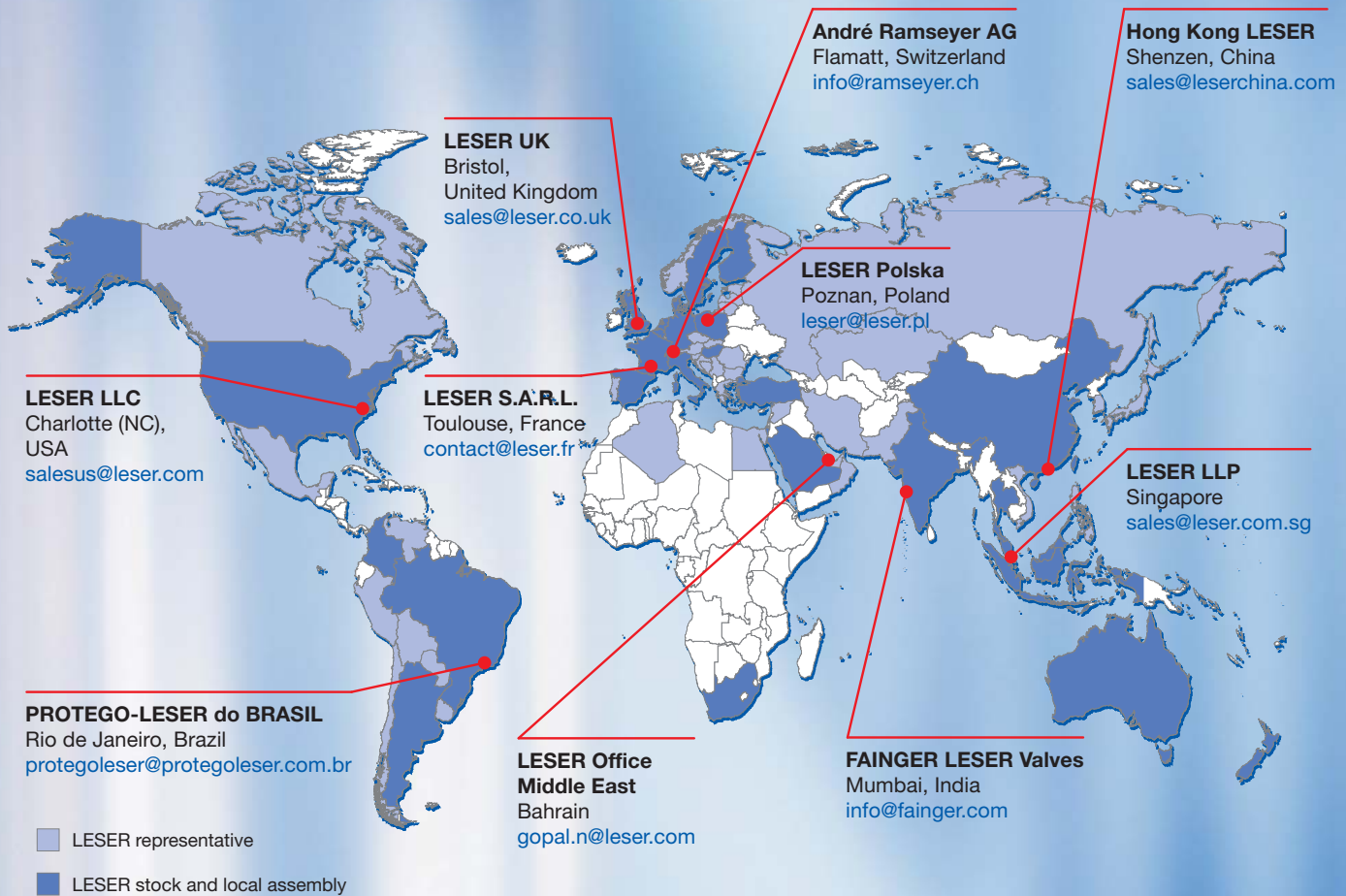
Price

A highly automated production in Germany guarantees an attractive cost / performance ratio for safety valves and spares.

LESER continuously invests in personnel, machinery and buildings to continue to provide this cost / performance ratio to its customers.



LESER worldwide



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LESER at a glance
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