

# TECHNICAL GASES & CRYO



## EXTREME CONDITIONS - SAFE SOLUTIONS

Safety valves and fittings for technical gases, hydrogen and cryogenic applications.

# WHAT SETS GOETZE AND THEIR TECHNICAL GASES PRODUCTS APART



## THE NEW DEFINITION OF HIGH-END! UP TO 21,756 PSI!

With a truly big bang, Goetze KG breaks through the valve sound barrier. Through the further development of the existing series 492, pressures of up to 21,756 psi are safeguarded in the 1/8" version. At the same time, the Goetze safety valve is only half the weight and half the size of comparable valves.



## INDIVIDUALITY

Our expertise enables us to implement new and custom-made developments in a short time. All valves are produced under premise of „individuality for more safety“. In product development, individual custom-made solutions go hand-in-hand with our own new developments. This combined pool of development has now given rise to an extensive and high-quality range of products which is being continuously extended and leaves nothing to be desired.



## SHORT DELIVERY TIMES AROUND THE GLOBE

Whether safety valves, overflow valves, ball diverter valves, pressure regulators, shut-off valves or other products from our range: you will benefit from the short global delivery times for all our products. All orders can generally be processed within 3-5 working days. You're in a hurry? Then use our express production and your order can be ready for dispatch within 48 hours.



## OIL AND GREASE-FREE PROCESS

All components of the series are specially cleaned during the production process and are thus generally free from oil and grease in accordance with DIN EN ISO 23208 and various works standards of gas producers. Because of this every valve is suitable for use in systems using oxygen and is marked accordingly.



## HIGH STANDARDS

Not only the products but also the raw materials used must meet the highest standards. The materials are examined by trained personnel as soon as they arrive, in order to ensure the best quality from the very beginning. After production, every individual valve is subjected to an ISO-certified quality control test before it is allowed to leave the factory.

# TECHNICAL BASICS FOR TECHNICAL GASES PRODUCTS

## Materials

### STAINLESS STEEL



- high-quality material
- corrosion-resistant
- for plants with particularly aggressive media

### GUNMETAL



- robust and of high quality
- potable- / sea-water resistant
- wide range of applications

### BRASS



- good price / performance ratio
- brass turned from solid material

### CAST STEEL

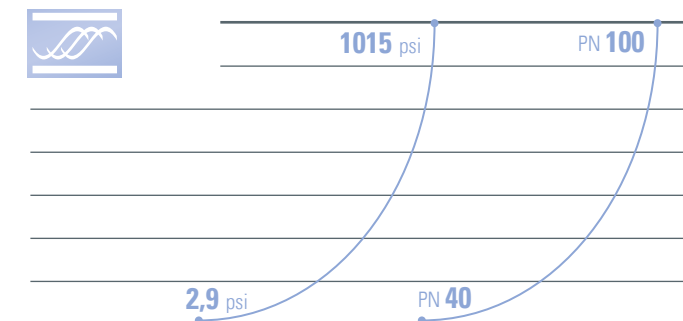


- robust material
- cost-effective material for standard applications

## Media

### LIQUIDS

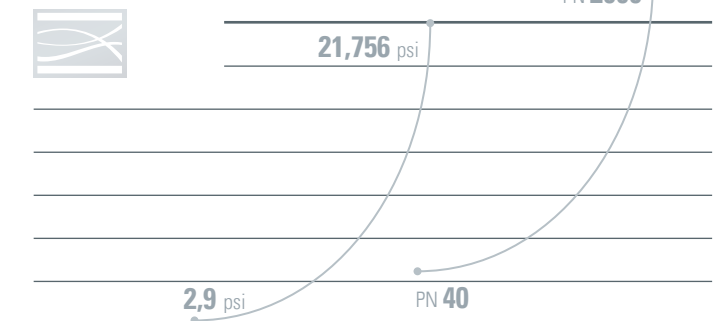
from -454 °F to +752 °F



- Storage of cryogenic liquefied gases
- Medical supply systems
- Foodstuff and Pharmaceutical
- Welding shops
- Cooling circuits

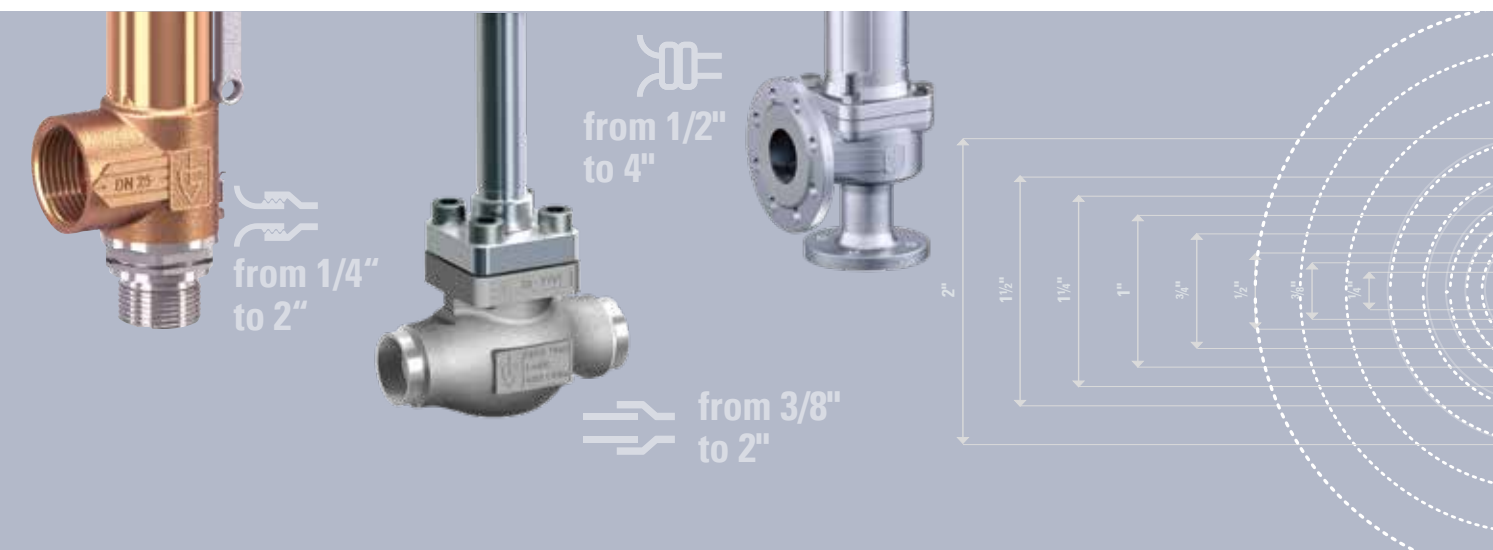
### AIR, GASES AND VAPOURS

from -454 °F to +752 °F



- Refrigeration plants
- Dry ice blasting plants
- H2 storage and refuelling systems
- Electrolysis
- Compressors

## Connections





High-Performance valve and fittings

# WE KNOW HOW TO HANDLE PRESSURE

## NEW SUBSIDIARY IN AMERICA

Goetze KG continues its internationalization and opens a new subsidiary in Fort Mill, America. With **Goetze Valves NA Inc.** you have competent advisors for technical solutions with experience and professional know-how on site.

Since **1st September 2022**, our colleagues Filiz White and Jeff Hansen have been at work in America. They are the two heads of our sales office in the land of unlimited possibilities.

After opening subsidiaries in China and Brazil, Goetze KG Armaturen is now expanding its range of activities to America. The aim is to offer customers a smooth consulting service directly on site. Because a direct contact partner and **competent consultation** is not to be replaced, in order to offer to the customers, wholesalers and partners an ideal security of the plant.

Goetze also offers the complete product range for **safety valves, overflow and control valves, pressure reducing valves** as well as **hygienic valves** in America. These can also be installed in America variably and always ideally matched to the application. The safety valves are designed and manufactured in Ludwigsburg - made in Germany.

As our customer, you can trust in products that make no compromises in terms of **functionality, durability** and **resistance**. You can rely on that!



*«For over 70 years, Goetze KG Armaturen has been manufacturing sophisticated high-performance valves and fittings for media under pressure: liquids, air, gases and vapours. For our family-run business the wishes and requirements of our customers are always the main focus, no matter whether you are looking for individual custom-made products or searching for solutions. With our experience and expertise we are the specialist and the right solution partner for you. Extensive tests, outstanding quality and international certifications are the successful pillars of the entire Goetze product range. With our family-run Goetze KG, you may always expect new and surprising things – based on our well-proven combination between innovation and tradition.»*

Tobias Weimann & Detlef Weimann  
Management, Goetze KG Armaturen

Professional and competent advice  
Are you looking for suitable solutions for your plants?



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# HYDROGEN

## Multiple energy source for the future

The industry for electricity generation is facing challenges to find green and sustainable resources and ways to produce electricity and so are engineers and companies for sustainable and green mobility concepts.

The production of hydrogen is already possible by using fossil fuels. But recently innovative processes are becoming more common, like electrolysis. In this case water is split into hydrogen and oxygen. If the required electricity for this process comes from renewable sources, the hydrogen is defined as green. This process for gaining a source of energy and a potential storage method for electricity (as the process can be reversed) makes it innovative in general and also for future mobility. One thing is clear: green energy is the future.

In this field Goetze is your partner regarding safety (valves). We assure the handling of hydrogen from the retrieval to the application – either in the electric part of the process or at the hydrogen filling station for the fuel cell vehicle. We protect filling processes, which are under high pressure or the storage of liquid hydrogen in tanks. This has a major impact on safe handling and makes hydrogen more appealing to humans and nature.



HYDROGEN FILLING STATION IN STUTTGART



PIPES ON A HYDROGEN TANK



HYDROGEN RESEARCH CENTRE



HYDROGEN FUEL PUMPS



ELECTROLYSIS SYSTEM

# SAFETY IN HYDROGEN APPLICATIONS

As the last mechanical component in the chain of safety, safety valves are an important and indispensable part of hydrogen applications. It is therefore even more important that every component of a safety valve, as well as the manufacturing process, have specific properties.

## MATERIALS

The use of high quality stainless steels. Austenitic steels with a nickel content > 10% have proven to be effective.

## SEALS

Pressure, temperature, permeation (diffusion) play an important role here. The elastomer sealing materials which comply with the NORSOK M-710 standard, are prepared against explosive decompression in the material and prevent the loss of the seal.

## MANUFACTURING PROCESS

Do you place high standards on the cleanness of your system components? In addition to the production which is free of oil, grease and particle, which is explicitly recommended for a hydrogen purity of > 5.0 (> 99.999 %).

## APPROVALS

Even if there are currently no specific H2 approvals, only use type-test approved safety valves to protect your systems.

Sound technical advice from the valve manufacturer is in any case indispensable. This is the only way to take your specific conditions into account and to design the valve correctly according to the conditions prevailing on site. Our technical experts will be happy to help you - quickly and reliably: **+1 (980) 422-3305**.



# HYDROGEN AS THE ENERGY CARRIER OF THE FUTURE

The initial situation is clear: A way is needed to make electricity from renewable sources storable.

The technology required for this ranges from electrolysis to pure hydrogen and oxygen to the production of ammonia and synthetic hydrocarbon compounds produced with PtX processes. Valves are required for all these processes.

Our product range is qualified for use with hydrogen as a medium. This ranges from specific material testing to the fulfilment of special standards for seals. Especially for the application for storing high-pressure hydrogen, we have significantly expanded the possibilities in production with new test benches.

Goetze is your partner in safety here too. As a manufacturer of safety valves, pressure reducing valves and overflow valves, Goetze products are used in almost all areas of the hydrogen value chain - from generation via electrolysis or other thermal processes and storage at high pressures, or cryogenically liquefied, right through to the point-of-use at the user.

## The journey is the destination

For us, the challenge lies less in the use of hydrogen, but rather in the way to get there, in order to then have its use widely available as quickly as possible.

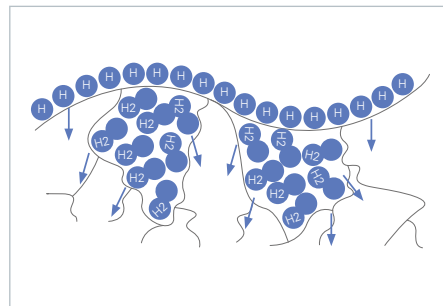
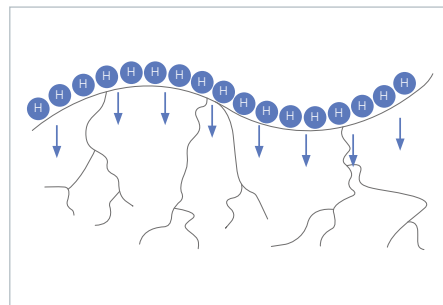
Internally, we look at proven designs that we improve and optimise for hydrogen applications and realise with high-quality, tested materials. In particular, we rely on stainless steels with a higher nickel content to prevent hydrogen embrittlement, for example.

For seals, compliance with certain standards is important. The very small  $H_2$  molecule can accumulate in sealing materials, penetrate them and destroy them from the inside. The seal must therefore be manufactured and specially tested with this in mind.

### Good to KNOW

#### Hydrogen embrittlement: What does this mean?

Hydrogen embrittlement occurs when ionised hydrogen is formed on the metal surface and diffuses into the material faster than it assembles into molecules on the material surface.



Further technical information on hydrogen can be found in this white paper.





# SAFETY VALVES AND FITTINGS FOR HYDROGEN APPLICATIONS

## Materials



**Temperatures**  
from -423°F to + 752 °F



**Pressures**  
from 2,9 psi to 21,756 psi

## Media



**Threaded connections**  
from ¼" to 2"



**Flange connections**  
from ½" to 4"

Goetze also has a wide portfolio of safety valves and pressure reducers for the hydrogen sector in the non-cryogenic area. The products on the following page are examples of this. In particular, gas applications in the high-pressure range and gas pressure control systems in a wide variety of applications are always in focus. Oxygen also plays a special role, whether in electrolysis or storage.

## GOETZE VALVES FOR GAS APPLICATIONS ARE USED HERE:



Hydrogen filling station in China



Electrolyser in Stuttgart



H2 high-pressure accumulator



Production of technical gases

# Safety valves and fittings for hydrogen applications

## SAFETY VALVES SERIES 492

made of stainless steel, with  
gas-tight, 360° rotatable outlet



The 492 series safety valve with rotating outlet cover is used in high-pressure compressors and process systems as well as for protecting refuelling systems. It impresses with its compactness and design.

Thanks to its special technical design and construction, the 492 series covers an unrivalled pressure range of up to 21,756 psi.

The valve is particularly suitable for hydrogen, whereby the high-performance materials used, such as PAI or PEEK, enable a very high level of tightness. This high level of tightness is maintained even after the valve has responded several times.

 **Temperatures**  
from - 76 °F to +392 °F

 **Pressures**  
from 725,2 psi to 21,756 psi

 **Threaded connections**  
from ¼" to 1"


## SAFETY VALVES SERIES 451


made of stainless steel, angle-type,  
with threaded connections



The advantages and applications of the 451 series made of high-alloy stainless steel begin where gunmetal versions reach their limits.

These safety valves in the 451 series are particularly suitable for applications involving hydrogen. Thanks to the versatility of the 451 valve with optionally available back pressure compensating stainless steel bellows or lifting, this safety valve is in demand throughout the entire hydrogen value chain.

 **Temperatures**  
from - 76 °F to +752 °F

 **Pressures**  
from 7,3 psi to 1015,3 psi

 **Threaded connections**  
from ½" to 2"

## SAFETY VALVES SERIES 420

made of stainless steel, angle-type,  
with threaded connections



To support hydrogen production, e.g. in the electrolysis process, safety valves are required that reliably protect the systems even at low pressures and low volumes.

Thanks to TÜV and European component approval, the miniature safety valves in the 420 series enable the use of tested and approved quality, even in these applications, with neutral and non-neutral gaseous and liquid media.

The optionally available cutting ring threaded connections make this valve quick and easy to install when used in small pipelines.

 **Temperatures**  
from - 40 °F to + 500 °F

 **Pressures**  
from 7,3 psi to 725,2 psi

 **Threaded connections**  
from ¼" to ¾"

## SAFETY VALVES SERIES 2400

made of stainless steel, angle-type,  
with threaded connections



The safety valves in the 2400 series are fully approved for vapours and gases as well as liquids. All valve components are specially cleaned during the manufacturing process and are therefore generally oil- and grease-free in accordance with DIN EN 12300.

The use of high-alloy stainless steels 1.4404 and 1.4408 makes the safety valves extremely resistant in extremely cold temperature ranges. An FDA-compliant sealing material is used for use with gases that come into contact with foodstuffs.

Overpressure in the range of 2,9 to 1015,3 psi is safely dissipated with consistently high performance.

 **Temperatures**  
from - 328 °F to +392 °F

 **Pressures**  
from 2,9 psi to 1015,3 psi

 **Threaded connections**  
from ¼" to 1½"

## SAFETY VALVES SERIES 455

made of stainless steel, angle-type,  
with flange connections




Our flange series 455 is used in applications where large volume flows need to be protected. In this area of system protection, flange connections are often installed in existing pipework systems.

We pay particular attention to the performance of the 455 series in all nominal diameters. This is unique in the field of flanged safety valves.

Thanks to the use of high-quality materials with excellent media resistance and the option of achieving the highest level of tightness to the atmosphere by means of a back-pressure compensating bellows, this safety valve is suitable for almost any application.

The pressure range extends from 2,9 to 580 psi and the operating temperature limit of +752 °F allows the valve to be used in a wide range of temperatures.

 **Temperatures**  
from - 423 °F to +752 °F

 **Pressures**  
from 2,9 psi to 580,2 psi

 **Flange connections**  
from ½" to 4"

## PRESSURE REDUCING VALVES SERIES 484

made of stainless steel,  
with female threaded connections



This diaphragm or piston pressure reducing valve made of stainless steel, with sleeve connections for pneumatic and hydraulic applications, is characterised above all by its particularly high flow rates and its low pressure loss, even with high power requirements.

The fully balanced valve, which compensates for inlet pressure fluctuations, is available with and without secondary venting, either as a diaphragm or piston version.

The pressure is set without tools using the ergonomically shaped handwheel. The extremely small pressure drop in the control operating range makes this high-performance pressure regulator unrivalled.

 **Temperatures**  
from -40 °F to +248 °F

 **Inlet pressure** up to 870 psi  
**Outlet pressure adjustable**  
from 7,3 psi to 725,2 psi

 **Threaded connections**  
from ¼" to 2"



Data sheet



Data sheet



Data sheet



Data sheet



Data sheet



Data sheet



## Safety valves and fittings for hydrogen applications

### SAFETY VALVES SERIES 451FL

made of stainless steel, angle-type,  
with flange connections



In the production of hydrogen, such as in electrolysis, safety valves are required that reliably protect the systems even at low pressures and low volumes. Thanks to TÜV and European component approval, the miniature safety valves in the 420 series are also used in these applications. The tested and approved materials and the quality of this safety valve make it suitable for use with neutral and non-neutral, gaseous and liquid media.

The optionally available cutting ring threaded connections make this valve quick and easy to install when used in small pipelines.



**Temperatures**  
from - 76 °F to + 752 °F



**Pressures**  
from 7,3 psi to 1015,3 psi



**Flange connections**  
from 1/2" to 2"



Data sheet

### SAFETY VALVES SERIES 461

made of stainless steel, angle-type,  
with threaded connections



The consistent expansion of this series with smaller nominal diameters now also enables the safety valve to be optimised and thus economically sized for smaller blow-off quantities.

The proven range of variants allows the valve to be used for different media in different states of aggregation. This series is very well suited and frequently used in measurement and control technology systems and in gas mixing stations, for example.



**Temperatures**  
from - 76 °F to + 437 °F



**Pressures**  
from 7,3 psi to 1015,3 psi



**Threaded connections**  
from 1/4" to 1/2"



Data sheet

## WATER ELECTROLYSIS

### Made in Baden-Württemberg

The industrialisation of water electrolysis in Germany is to be driven forward by the ZSW project: "Electrolysis made in Baden-Württemberg".

Particularly in view of the growing awareness of the need to meet the Paris climate protection targets and the increasing pressure to act, new, long-term viable options for the economy, especially for industrial companies, must be developed as quickly as possible.

Water electrolysis is the key technology here. It enables the production of hydrogen from water and electricity and thus helps to minimise to compensate for fluctuations in the supply of renewable electricity sources. Renewable energy can be stored and is available for further energy supply when there is a lull in the wind or low solar radiation.



**Goetze is your partner when it comes to safety.**

The series 461 angle safety valve made of stainless steel with PTFE seal has been cleaned oil- and greasefree for use with hydrogen. Equipped with these properties, **the series 461 stainless steel valve** protects the gaseous phase of the electrolyser. A special GOX version is available for oxygen applications (use of special materials including oil- and greasefree production).



**The gunmetal angle safety valve of the 652 series** secures the water supply to the electrolyser and is therefore used in the liquid phase.

As the entire system falls under the ATEX directive, ATEX approval was also requested for all safety valves installed and the corresponding certificates were enclosed.





# HIGH PRESSURE SAFTEY VALVES FOR OXYGEN APPLICATIONS

<b>Materials</b> 	<b>Media</b> 
<b>Temperatures</b> from -40 °F to + 140 °F	<b>Pressures</b> from 725,2 psi to 6091,5 psi
<b>Threaded connections</b> from 1/4" to 3/4"	

With increasing pressures and/or temperatures in oxygen applications, the risk of fire also increases. Due to the fire-promoting effect of oxygen, the ignition temperature of materials is significantly reduced. As a result, materials that are not combustible under normal ambient conditions are now completely burnt under the effect of the oxygen. At high pressures, pressure surges can cause very high temperatures. These significantly exceed the ignition temperature of metallic materials, which is lower under the influence of oxygen and can lead to catastrophic fires. For critical applications of this kind, Goetze has developed a suitable and safe solution with the 492GOX series. Here, the pressure-bearing parts have been replaced by correspondingly safe materials such as monel and brass.

## GOETZE VALVES FOR OXYGEN APPLICATIONS ARE USED HERE:



## SAFETY VALVES SERIES 492GOX

made of brass,  
with threaded connections



Safety valves that are specially designed for oxygen applications are used in a wide range of industries. In particular in the production of technical gases, medical gases, compressor manufacturers, component manufacturers and plant engineers.

Due to the special requirements for high-pressure oxygen, the 492GOX safety valve has components made of Monel to reliably prevent oxygen burnout.

In addition, the 492GOX safety valve has undergone a special oxygen pressure surge test. The compact design and the rotatable outlet with threaded connections, which allows the valve to be positioned in the desired blow-out direction even after installation, make the 492GOX safety valve an innovative addition to the product portfolio.

<b>Temperatures</b> from - 40 °F to + 140 °F
<b>Pressures</b> from 725,2 psi to 6091,5 psi
<b>Threaded connections</b> from 1/4" to 3/4"



Data sheet



# EXTREME CONDITIONS - SAFE SOLUTIONS

With increasing pressures and/or temperatures in oxygen applications, the risk of fire also increases.

Due to the fire-promoting effect of oxygen, the ignition temperature of materials is significantly reduced. As a result, materials that are not flammable under normal ambient conditions are now completely burnt under the effect of the oxygen.

At high pressures, pressure surges can cause very high temperatures. These significantly exceed the ignition temperature of metallic materials, which is lower under the influence of oxygen, which can lead to catastrophic fires.

For critical applications of this kind, GOETZE has developed a suitable and safe solution with the series 492GOX. The pressure-bearing parts here have been replaced by correspondingly safe materials such as Monel and brass.

## APPLICATIONS WITH OXYGEN? BUT SAFE!

### Oxygen valves in use

Safety valves that are specially designed for oxygen applications are used in a wide variety of industries. In particular, in the area of the production of technical gases, medical gases, with compressor manufacturers as well as component manufacturers and plant constructors.

Due to the special requirements for high-pressure oxygen, the 492GOX safety valve has components made of Monel to safely prevent oxygen burnout. In addition, the 492GOX safety valve was subjected to a special oxygen pressure surge test.



More technical information on the 492 series can be found in the data sheet.



## Production process Purified Gases

In many areas of the application of technical gases, particularly high demands are placed on the purity of the gases and on the fittings in use.

They are used above all in the production of technical and medical gases, for hydrogen in fuel cells, by compressor manufacturers and plant constructors, manufacturers and plant constructors.

The handling of high-purity gases requires extreme care throughout the entire production process. This is the only way to avoid hazards in the application. In order to meet these high standards, Goetze has a production process (Purified Gases) specially designed for high-purity gases.

### PRODUCTION PROCESS:

Receipt of the enquiry followed by a technical check by our sales department whether the sealing materials and lubricants are suitable for the pressures and temperatures required in the application.

For critical gases, such as oxygen and hydrogen, compliance with essential processes is necessary. In the area of oxygen applications, it is necessary to use sealing materials that have been tested by the Federal Institute for Materials Testing (BAM) for this specific application. In applications with hydrogen, there are also requirements for the purity (e.g. in fuel cell systems) of the gas and thus for the components, as well as for the properties of the sealing materials to be used (Norsok Standard M-710 for o-rings).

Cleaning of the individual parts with specific solvents and ultrasound. The individual parts are then packed in closed transport boxes.

The assembly, testing, packaging and labelling of the valves is carried out at our own assembly stations. These steps serve the purpose of achieving corresponding limit values of hydrocarbon compounds and particle impurities.

- Limit value for hydrocarbon impurities:  $\leq 100 \text{ mg/m}^3$
- Limit value for particle impurities:  $\leq 100 \mu\text{m}$

Dispatch of the valves to the customer.

Professionally trained personnel, compliance with all relevant regulations and recurring processes, monitoring of the cleaning which is free of oil, grease and particles, assembly, testing, packaging and labelling guarantee customers a valve which conforms to high-purity gas standards for their applications.



Separate assembly area for valves in high purity gas applications



## SAFETY VALVES AND FITTINGS FOR CRYOGENIC APPLICATIONS

### Materials



**Temperatures**  
from -328 °F to +392 °F



**Pressures**  
from 2,9 psi to 1015,3 psi  
PN40, PN63 and PN100

### Media



**Threaded connections**  
from 1/4" to 1 1/2"



**Welding end /  
Welding socket**  
3/8" to 2"

The cryogenic valves by Goetze KG are pioneering in their application and can be used in many industries. Low-temperature gases are used in many industries, ranging from food processing, medical equipment down to energy production. The outstanding quality of the new cryogenic valves by Goetze has been confirmed by their approval for use with both gases and vapours – and as well as for liquids.

### GOETZE VALVES FOR CRYOGENIC APPLICATIONS ARE USED HERE:



Tunnel cooling systems



Cryogenic machining



LNG applications



# Safety valves and fittings for cryogenic applications

## SAFETY VALVES SERIES 2400

made of stainless steel, angle-type,  
with threaded connections



In cryogenic technology, valves must fulfil special requirements in order to provide reliable protection, e.g. for tanks and filling systems filled with cryogenic liquefied gas. The safety valves in the 2400 series have therefore been fully approved for vapours and gases as well as for liquids in accordance with ISO 4126-1 and ASME Code Sec. VIII Div. 1.

This means that every valve is suitable for use in systems with oxygen and is labelled accordingly.

The use of high-alloy stainless steels 1.4404 and 1.4408 makes the safety valves extremely resistant in extremely cold temperature ranges. An FDA-compliant sealing material was used for use with gases that come into contact with foodstuffs. Overpressure in the range from 2,9 to 1015,3 psi is safely dissipated with consistently high performance.

 **Temperatures**  
from -328 °F to +392 °F

 **Pressures**  
from 2,9 psi to 1015,3 psi

 **Threaded connections**  
from 1/4" to 2"

## SAFETY VALVES SERIES 2480

made of gunmetal, angle-type,  
with threaded connections



The now tried-and-tested 2400 series safety valves in stainless steel now have a sister series in gunmetal with the 2480 variant. This series is characterised in particular by the fact that the outlet is enlarged by one or two nominal diameters, meaning that two different performance classes are available in one valve size.

The function and performance are based exactly on the sister series and are as stable in function as they are high in performance. The fact that the approvals according to ISO 4126-1 and ASME Code Sec. VIII Div. 1 are also covered is a prerequisite for us.

All gunmetal valves are of course suitable for oxygen service and fulfil all current delivery requirements according to international standards such as DIN EN, ASTM, EIGA and CGA as well as the specifications of gas manufacturers.

 **Temperatures**  
from -328 °F to +392 °F

 **Pressures**  
from 2,9 psi to 1015,3 psi

 **Threaded connections**  
from 1/4" to 1"



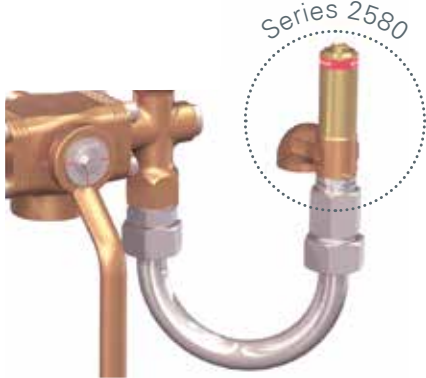
Data sheet



Data sheet

## OVERFLOW VALVES SERIES 2580

made of gunmetal, angle-type,  
with threaded connections




The overflow valve is characterised by a continuous and quiet pressure reduction, as can occur in the application on tanks for the storage of cryogenic liquefied technical gases such as argon, oxygen, nitrogen or carbon dioxide.

It is set to a pressure below the response pressure of the safety valves and thus prevents the safety valves of the tank from responding.

By using the Type 2580 overflow valve, only the amount of gas generated by the heat input into the container is ever discharged. When gas is removed, the valve closes so that no gas is lost unnecessarily. The overflow valve is easily mounted on the lower connections of the diverter ball valve. The connecting pipe bend required for this can be supplied directly.

 **Temperatures**  
from -328 °F to +392 °F

 **Pressures**  
from 2,9 psi to 1015,3 psi

 **Threaded connections**  
from 1/4" to 1/2"



Data sheet

## SHUT-OFF VALVES SERIES 2140

made of stainless steel,  
in straight form




The main function of the 2140 shut-off valve is the controlled opening and closing of pipe sections via the valve seat integrated in the body.

Thanks to the use of high-quality stainless steel materials, the valve can be used for cryogenic operation at temperatures down to -320,8 °F. The shut-off valves are approved in accordance with DIN EN 1626.

The series is available in nominal diameters 3/8" - 2" and can be designed with connection options for butt welds and socket welds. The manual valve actuator is operated via an ergonomically shaped handwheel; the open/closed position can be recognised at any time via a visual position indicator.

The valve bonnets can be configured with four different actuator lengths depending on the application and operating environment.

 **Temperatures**  
from -320,8 °F to +248 °F

 **Pressures**  
PN 63

 **Butt weld / Socket weld**  
from 3/8" to 2"



Data sheet

## SHUT-OFF VALVES SERIES 2180

made of gunmetal,  
in straight form



The 2180 series is characterised by a corrosion-resistant, lead-reduced gunmetal body and a valve bonnet made of stainless steel.

The design of the 2180 series is identical to that of the 2140 series and therefore offers an excellent price-performance ratio.

The valve cone is made of brass CW617N and is adapted to the high-quality stainless steel valve spindle.

Threaded and soldered socket connections are available as connection options.

The series complies with the requirements of DIN EN 1626.

 **Temperatures**  
from -320,8 °F to +248 °F

 **Pressures**  
PN 63

 **Butt weld / Socket weld**  
from 3/8" to 2"



Data sheet

## NON-RETURN VALVES SERIES 2142/2182

made of stainless steel / of gunmetal,  
in straight form




The non-return valves are used in pipelines for the storage, transport and production of liquefied gases and ensure protection against the unwanted backflow of gases or liquids.

The check valves are used at operating temperatures from -320,8 °F to +248 °F and are available in nominal diameters of 3/8" - 2" and in pressure ranges up to 913,73 psi.

The valves can be designed with stainless steel (series 2142) or gunmetal bodies (series 2182).

 **Temperatures**  
from -320,8 °F to +248 °F

 **Pressures**  
PN 63

 **Butt weld / Socket weld**  
**Thread / Soldering socket**  
from 3/8" to 2"



Data sheet 2142



Data sheet 2182

Safety valves and fittings for cryogenic applications

DIVERTER BALL VALVES  
SERIES 2700

made of stainless steel, angle-type,  
with threaded connections



The optimised design of the flow channels within the diverter ball valve enables particularly high flow rates. As a result, the flow pressure losses to the safety valves are significantly reduced and safe functioning is guaranteed. The use of high-alloy stainless steels 1.4404 and 1.4408 ensures high resistance to internal and external influences.

An FDA-compliant sealing material was used for use with gases that come into contact with food.

Due to the oil- and greasefree production, the diverter ball valves are generally suitable for use in systems with oxygen. With the ergonomically shaped handle and the separate test connections, the diverter ball valve is optimally prepared for the maintenance of safety valves.

 **Temperatures**  
from -328 °F to +248 °F

 **Pressures**  
PN 63

 **Threaded connections**  
from 3/4" to 1 1/4"

DIVERTER BALL VALVES  
SERIES 2780/2782


made of gunmetal,  
with threaded connections




As already implemented in the 2700 stainless steel series, the 2780 gunmetal diverter ball valve also has a flow geometry with very low pressure loss. The safe function of the safety valves mounted on the diverter ball valve is therefore always guaranteed.

In addition, compared to the vertically mounted safety valves, connections for bursting discs are also available here. Thanks to the consistent cleaning of all individual parts, the gunmetal diverter ball valve is also ideally equipped for use in oxygen systems.

Our series 2782 offers you additional connection options.

 **Temperatures**  
from -328 °F to +248 °F

 **Pressures**  
PN 63

 **Threaded connections**  
from 3/4" to 1 1/4"

DIVERTER BALL VALVES  
SERIES 2781/2783

made of gunmetal,  
with threaded connections




Diverter ball valve for the installation of e.g. two safety valves in combination with bursting discs to protect containers for the storage of cryogenic liquefied gases.


The requirements of the Pressure Equipment Directive for redundant or different types of safety devices are met with this valve and in conjunction with the safety valves of the 2400 / 2480 series. Two additional connections for suitable bursting discs are available on each side.

If the safety valves require maintenance or the bursting discs need to be replaced, the side requiring maintenance is shut off from the tank.

Our series 2783 also offers you additional connection options for this type.

 **Temperatures**  
from -328 °F to +248 °F

 **Pressures**  
PN 63

 **Screw connection with  
welding end / solder nipple**  
1"

PRESSURE REGULATORS  
SERIES 2980


made of gunmetal,  
with pipe or threaded connections



The series 2980 pressure regulator is designed to control the vessel pressure on tanks for the storage of cryogenic liquefied gases such as LIN, LOX, CO2, LAr, LNG and operates in 3 functions as a combination regulator.

Thanks to the use of two high-quality stainless steel bellows and the housing material made of lead-reduced gunmetal, the combination regulator operates vibration-free. Thanks to the special PTFE seat seal in conjunction with the improved seat/plug contour design, the regulator has a permanently tight seal.

The pressure regulator is available in three different pressure ranges and can be individually adjusted up to 38 bar. The pressure regulator is characterised by a wide temperature range and excellent control quality. For use with cryogenic liquefied oxygen, the combination regulator is always manufactured oil- and greasefree.

 **Temperatures**  
from -320,8 °F to +392 °F

 **Pressures**  
PN 40

 **Threaded connections**  
1"

DIRT TRAP  
SERIES 2143/2183


made of stainless steel / of gunmetal,  
in straight form




The dirt traps in the 2143 series consist of a straight-through housing made of high-quality stainless steel and, in the 2183 series, of lead-reduced gunmetal.

The strainer unit integrated between the body and lid is available in various mesh thicknesses.

Installing the dirt traps prevents contamination in the medium and in the downstream process.

 **Temperatures**  
from -320,8 °F to +392 °F

 **Pressures**  
PN 63

 **Butt weld / Socket weld  
Thread / Soldering socket**  
from 3/8" to 2"

LOCKING  
SLEEVE UNIT


made of stainless steel or brass,  
angle-type with threaded connections



For easy alignment and positioning of the safety valves on the diverter ball valve. The versions are available in different sizes and materials. Delivery is always oil- and grease-free and the PTFE seals are FDA-compliant.

 **Temperatures**  
from -320,8 °F to +392 °F

 **Pressures**  
PN 100

 **Threaded connections**  
from 1/2" to 1"



Data sheet



Data sheet 2780



Data sheet 2782



Data sheet 2781



Data sheet 2783



Data sheet



Data sheet 2143



Data sheet 2183



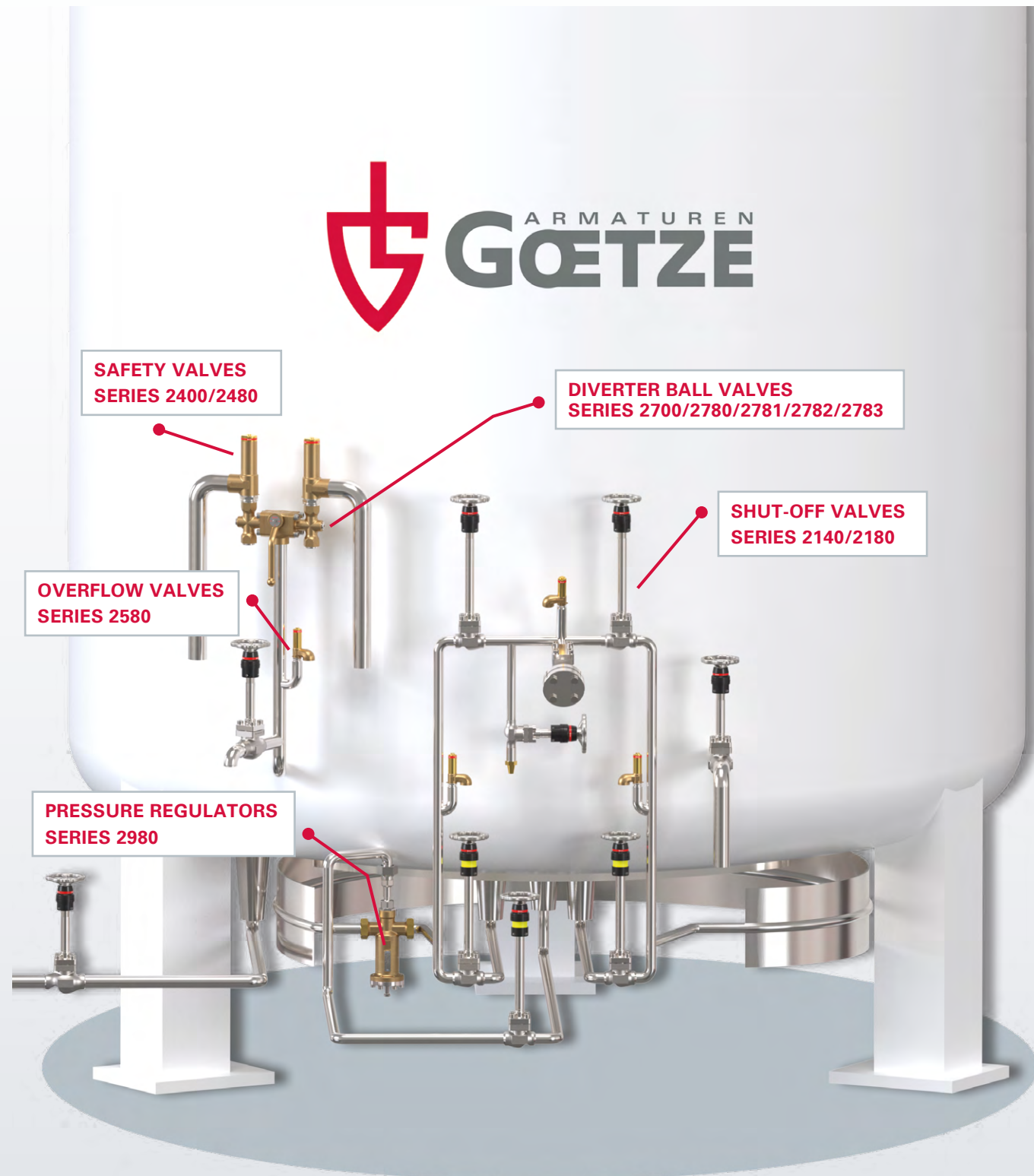
Data sheet



# EVERYTHING FROM A SINGLE SOURCE

## Goetze valves in combination

**Protect, Shut-off, Control or Divert** – with the products for cryogenic applications from Goetze KG Armaturen you can source everything from one single supplier. Goetze is also your partner when it comes to the subject of safety. With our cryogenic valve package we guarantee safe installations and storage tanks.



### ► SAFETY VALVES SERIES 2400/2480

- high blow-off capacity
- compact design
- FDA compliant sealing material
- high-quality materials 1.4404 / C499K

### ► OVERFLOW VALVES SERIES 2580

- safe discharge of boil off gas
- easy and quick installation and adjustment of the set point with a hexagonal key
- can be sealed to prevent unauthorised adjustment

### ► SHUT-OFF VALVES SERIES 2140/2180

- straight-through housing with flow-optimised housing geometry
- high Kvs-value
- open / closed position clearly visible via optical position indicator
- manually operated actuator (open & close) via ergonomically designed stainless steel handwheels
- executable with non-return function

### ► DIVERTER BALL VALVES SERIES 2700/2780/2781/2782/2783

- flow-optimised housing
- separate test connections
- ergonomically shaped handle

### ► PRESSURE REGULATORS SERIES 2980

- wide setpoint range and simple, convenient mechanical pressure adjustment
- high flow capacity due to bellows control made of high-quality stainless steel
- compatible, market-standard overall length
- standard, integrated fine filter on valve inlet and outlet



### ► NON-RETURN VALVE SERIES 2142 / 2182

- low opening pressure
- high Kvs-value

### ► DIRT TRAP SERIES 2143 / 2183

- standard mesh size 250µm
- optional mesh sizes on request





## SAFETY VALVES AND FITTINGS FOR TECHNICAL GASES

### Materials



**Temperatures**  
from -121 °F to +752 °F



**Pressures**  
from 2,9 psi to 1015,3 psi  
PN40, PN63 and PN100

### Media



**Threaded connections**  
from 1/4" to 1 1/2"



**flange connections**  
1/2" to 4"

Technical gases such as hydrogen, nitrogen and oxygen. Safety and hygiene under extreme conditions. - Only the best materials and designs can master these parameters. High-quality, robust and corrosion-resistant, our safety valves and fittings for technical gases offer you the perfect conditions for smooth operation.

### THE GOETZE VALVES ARE USED HERE:



Manufacture of pharmaceuticals



Petrochemical industry



Desalination plants



Safety valves and fittings for technical gases

SAFETY VALVES  
SERIES 255/255 ANSI

made of cast steel, angle type,  
with flange connections



made of stainless steel, angle type, with  
flange connectionsThe 255 series is char-  
acterised by robust cast steel and a wide  
range of variants for a variety of industrial  
applications. These safety valves cover nom-  
inal diameters from ½" to 4" and offer a con-  
sistent performance, function and design  
concept that enables both vertical and hori-  
zontal installation. The series is particularly  
easy to maintain thanks to its low overall  
height and the option of using a full-nozzle  
design. Ideal for fast-reacting processes in  
chemical plants.

For US standards, the ANSI version is avail-  
able with ASME B16.5 flanges and API 526  
valve stem lengths, which facilitates integra-  
tion into corresponding systems.

 **Temperatures**  
from - 121 °F to + 752 °F

 **Pressures**  
from 2,9 psi to 580,2 psi

 **Flange connections**  
from ½" to 4"



Data sheet 355



Data sheet 355 ANSI

SAFETY VALVES  
SERIES 355

made of spheroidal graphite iron,  
angle-type, with flange connections



The 355 series of our flanged safety valve  
impresses with its consistent concept in  
terms of performance, function and design.

The use of spheroidal graphite cast iron as  
the body material results in a particularly  
cost-effective valve variant. This safety valve  
is particularly interesting in gas systems  
without corrosive effects of the media used,  
but where high performance is still required.

 **Temperatures**  
from - 14 °F to +662 °F

 **Pressures**  
from 2,9 psi to 580,2 psi

 **Flange connections**  
from ½" to 4"



Data sheet

SAFETY VALVES  
SERIES 455/455 ANSI


made of stainless steel, angle type,  
with flange connections




Our 455 flange series is used in applica-  
tions where large volume flows need to be  
ensured. Flange connections are often in-  
stalled in existing pipework systems in this  
area of system protection.

Thanks to the use of high-quality materials  
with excellent media resistance and the op-  
tion of a back-pressure compensating bel-  
lows to ensure the highest level of tightness  
to the atmosphere, this safety valve is suita-  
ble for almost any application.

For US standards, the ANSI version is avail-  
able with ASME B16.5 flanges and API 526  
valve stem lengths, which facilitates integra-  
tion into corresponding systems.

 **Temperatures**  
from - 423 °F to + 752 °F

 **Pressures**  
from 2,9 psi to 580,2 psi

 **Flange connections**  
from ½" to 4"



Data sheet 455



Data sheet 455 ANSI


SAFETY VALVES  
SERIES 460

made of stainless steel, angle-type,  
with threaded connections



If the high-performance safety valves with  
their numerous equipment variations are  
technically too complex and oversized in  
terms of performance for standard appli-  
cations, but the highest attention is paid  
to quality and corrosion resistance, this all-  
round safety valve from the 460 series made  
of stainless steel is the optimum solution.

Whether with or without lifting, the bonnet  
is always gas-tight.

 **Temperatures**  
from - 76 °F to +437 °F

 **Pressures**  
from 2,9 psi to 362,5 psi

 **Threaded connections**  
from 3/8" to 1"



Data sheet

SAFETY VALVES  
SERIES 861

made of gunmetal, angle-type,  
with threaded connections



A compact and price-conscious gunmetal  
angle-type housing safety valve for use in  
systems without special corrosivity require-  
ments. With the GOX option, also very suit-  
able for applications with oxygen.

 **Temperatures**  
from - 76 °F to +3263 °F

 **Pressures**  
from 0,5 bar to 50 bar

 **Threaded connections**  
from ¼" to ½"



Data sheet


SAFETY VALVES  
SERIES 451R

made of stainless steel, in conjunction with  
pre bursting disc and clamp connections




With the 451r series in combination with the  
KUB-Clean bursting disc, Goetze provides  
comprehensive protection for systems.

If the system has to be operated at high  
operating pressure, the bursting disc pre-  
vents the initial release of operating fluids  
that should not be released into the environ-  
ment. This achieves a high level of technical  
system tightness.

 **Temperatures**  
from - 40 °F to +392 °F

 **Pressures**  
from 29 psi to 362,5 psi

 **Flange connections**  
from ¾" to 1 ¼"



Data sheet

Safety valves and fittings for technical gases

SAFETY VALVES  
SERIES 4420/4450

made of stainless steel, angle type,  
with threaded connections



The all-round safety valves in the 4420/4450 series focus on connection flexibility and corrosion resistance. Depending on the pressure range, the valves can be designed with either a high-quality moulded diaphragm or a gas-tight valve bonnet. The two-part design of the valve body offers the possibility of numerous connection types at the valve inlet; in combination with the highly corrosion-resistant stainless steel, the valves can be used in a wider range of applications.

- Temperatures**  
from -58 °F to +401 °F
- Pressures**  
from 7,3 psi to 362,59 psi
- Threaded connections**  
from ¾" to 1 ¼"



PRESSURE REDUCING VALVES  
SERIES 684

made of gunmetal,  
with female threaded connections



All the special and technical features of the stainless steel versions are also available in the corrosion-resistant gunmetal series 684. The fully balanced valve, which equalises upstream pressure fluctuations, is available with and without secondary venting, either as a diaphragm or piston version. The pressure is set without tools using the ergonomically shaped handwheel. The extremely small pressure drop in the control operating range makes these high-performance pressure reducing valves almost unrivalled. The GOX option for gaseous oxygen makes them ideal for use in oxygen measuring and control stations, for example.

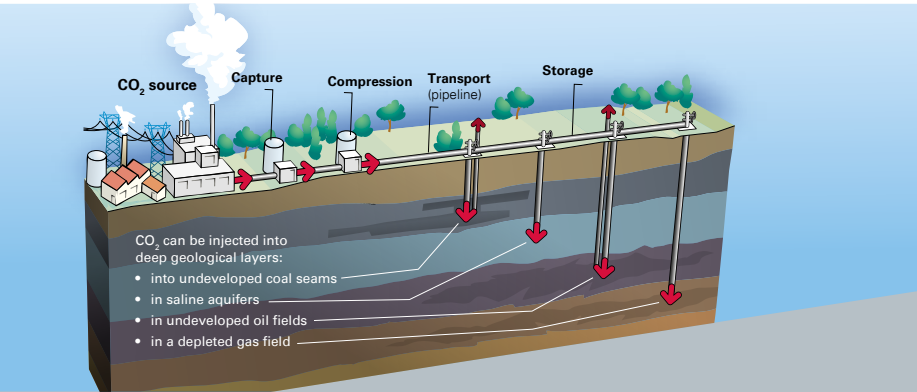
- Temperatures**  
from -40 °F to +248 °F
- Inlet pressure** to 870,2 psi,  
**Outlet pressure adjustable**  
from 870 psi to 725,2 psi
- Threaded connections**  
from ¼" to 2"



CARBON CAPTURE & STORAGE  
CCS

Storing carbon dioxide (CO<sub>2</sub>) underground in an environmentally friendly and permanent manner

As industrial CO<sub>2</sub> emissions are largely responsible for increasing the temperature in the atmosphere, the CO<sub>2</sub> is captured and separated directly from the industrial processes, i.e. on site at the producer. The CO<sub>2</sub> is then liquefied under high pressure so that it can be transported via existing infrastructure, e.g. the rail network, to safety storage facilities. This approach is particularly suitable for emission-intensive process industries such as steel, cement, lime, fertilisers, pulp and paper, petrochemicals and waste incineration plants.



A way to reduce greenhouse gases  
with GOETZE safety valves:

GOETZE safety valves are involved in all steps from capture to injection of the CO<sub>2</sub> into the underground storage facilities. The processes required for this take place under overpressure. In the event of failure of control systems and regulators, which are responsible for filling levels, temperatures and, in particular, internal overpressure, for example, the tanks and apparatus must be protected by mechanically operating overpressure protection. In addition to overpressure protection for tanks and apparatus, there are additional requirements for the valves and fittings that need to be taken into account due to the **chemical resistance of the sealing and housing materials** used.

Because not all CO<sub>2</sub> is the same

It depends on whether the CO<sub>2</sub> is present in a pure dry or moist state, or whether it contains admixtures of other substances. GOETZE can support you with a large selection of suitable body and sealing materials.



# CONNECTION POSSIBILITIES

Connection type	Drawing	Description
f		Whitworth male threaded pipe connection cylindrical; seal not made on thread BSP-P according to DIN ISO 228
m		Whitworth male threaded pipe connection cylindrical; seal not made on thread BSP-P according to DIN ISO 228
BSP-Tm		Whitworth male threaded pipe connection tapered; seal made on thread male connection BSP-T according to DIN EN 10226
NPTf		US standard tapered pipe thread NPT female threaded pipe connection NPT according to ANSI / ASME B 1.20.1 seal made on thread
NPTFf		US tapered pipe thread for dry closure NPTF female threaded pipe connection NPTF according to ANSI / ASME B1.20.3 seal made on thread
NPTm		US standard tapered pipe thread NPT male threaded pipe connection NPT according to ANSI / ASME B 1.20.1 seal made on thread
METf		Metric ISO female connection according to DIN 13 seal not made on thread
METm		Metric ISO male connection according to DIN 13 seal not made on thread
FCDxA		FCD = Flange connection moulded to DIN EN 1092 x = Pressure rating PN   1 = PN10; 2 = PN16; 3= PN25; 4 = PN40 A = Standard with sealing strip form B <sup>1</sup>

<sup>1</sup> Other versions of the sealing strip on request.

Connection type	Drawing	Description
FCAxA		FCA = flange connections moulded according to ASME B 16.5 x = Pressure rating / class   1 = Class 150; 2= Class 300 A = Standard with sealing strip raised face <sup>1</sup>
FCBxA		FCB = Cast flange connections according to ASME B 16.24 x = Pressure rating / class   1 = Class 150; 2= Class 300 A = Standard with raised face sealing strip <sup>1</sup>
SE		Welding end SE1 for pipes according to DIN EN ISO 1127 SE2 for pipes according to ASTM A312 S10 SE3 for pipes according to ASTM A312 S40 SE4 for pipes according to DIN 11850 row 2; DIN 11866-A; DIN EN 10357 series A SE5 for pipes according to DIN EN ISO 1127; DIN 11866-B; DIN EN 10357 series C SE6 for pipes according to BS 4825-1; DIN 11866-C
SM		Welding socket SM1 for pipes according to DIN EN ISO 1127 SM2 for pipes according to ASTM A312 S10 SM3 for pipes according to ASTM A312 S40
LM		Soldering socket LM1 for pipes according to DIN EN ISO 1127 LM2 for pipes according to ASTM A312 S10 LM3 for pipes according to ASTM A312 S40 LM4 for pipes according to DIN EN 12449
FLDxA, FLDxB		FLD = loose flange to DIN EN 1092 up to max. PN100 x = Pressure class PN   1 = PN10; 2 = PN16; 3= PN25; 4 = PN40; 5 = PN63; 6= PN100 A = Standard with raised face form B <sup>1</sup> B = Sealing strip with groove form D <sup>1</sup>
FLAxA, FLAxB		FLA = loose flange according to ASME B 16.5 up to max. 600 lbs x = Pressure rating / class   1 = Class 150; 2 = Class 300; 3 = Class 400; 4 = Class 600 A = Standard with sealing strip raised face <sup>1</sup> B = Sealing strip with ring joint face <sup>1</sup>
FWDxA		FWD = Welding neck flange according to DIN EN 1092 x = Pressure class PN   1 = PN10; 2 = PN16; 3= PN25; 4 = PN40; 5 = PN63; 6= PN100 A = Standard with sealing strip form B <sup>1</sup>
FWAxA		FWA = Welding neck flange according to ASME B 16.5 x = Pressure rating / class   1 = Class 150; 2 = Class 300; 3 = Class 400; 4 = Class 600 A = Standard with sealing strip raised face <sup>1</sup>

<sup>1</sup> Other versions of the sealing strip on request.

# HOW TO HANDLE PRESSURE

**Quality. Safety. Competence.** This is what Goetze stands for. Like hardly any other company in the field of safety valves and fittings, we combine the experience of tradition with the esprit of innovation. We support our customers with high-quality products, comprehensive service and know-how.

## The Goetze product range

Our locations

**GERMANY, LUDWIGSBURG**

CHINA, BRAZIL, USA | SALES DISTRIBUTORS

**-454°F – +752 °F**

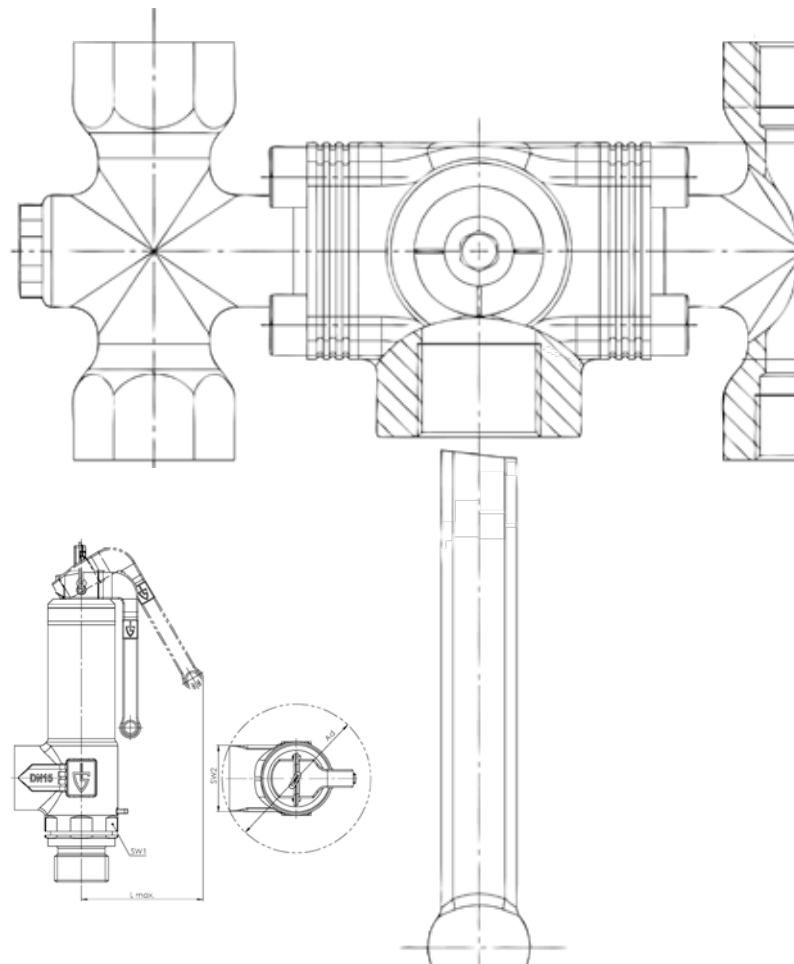
uncompromising performance

**2,9 PSI – 21,756 PSI**

impressive pressure range

## Goetze's concentrated expertise

We support our customers with our many years of experience in this sector at the highest level. Thanks to the expertise of our qualified development team, we are able to continuously develop new and innovative products and adapt to individual customer requirements. Using precise manual work and precision manufacturing, we are able to advance the ideas and product innovations of our customers – customer-focused, solution-oriented, flexible and always in German brand quality.



# THE GOETZE KG ARMATUREN

## Individuality for more safety

The competence of Goetze KG Armaturen has been in demand for over 75 years. Our wealth of experience is as broad and varied as our areas of application for our high-performance fittings. Our well thought-out product portfolio covers every industrial application: Liquids of all kinds, gases, technical vapours and steam. Goetze valves are used with temperatures ranging from -454 °F up to +752 °F. The greatest possible safety is a priority.

### PROFESSIONAL AND COMPETENT ADVICE

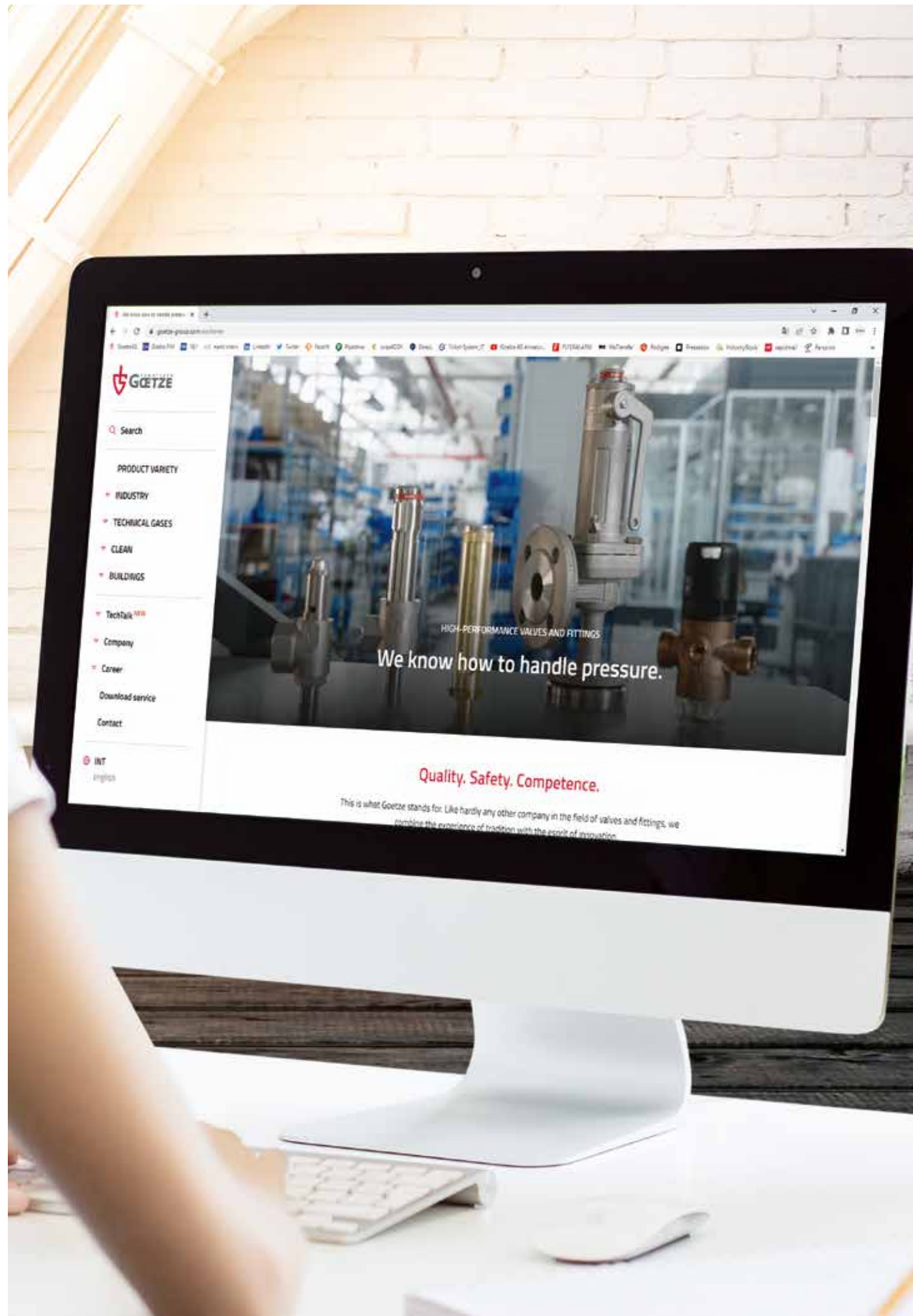
At any time, you can reach a competent contact partner as part of our in-house team at Goetze. Whether it is for the product selection, the configuration of the right valve, urgent requests, whether per telephone call or per mail, there is a personal multilingual consultant at your disposal. With our valves and fittings - "Made in Germany" - we are your competent partner for all matters relating to the handling of pressure.

Technical consulting is not only the focus of our in-house team. We provide support for our customers with the necessary information and instructions throughout the entire life cycle of the valve thereby assisting those persons who have to work with the fittings every day. Our field representatives are tasked with providing customers with the best possible consultation service at the customer's facility and supporting them in all questions concerning our products.

### GLOBAL TRADE

Goetze products – available worldwide, directly and quickly. No matter whether through Goetze or our trading partners. Our sales subsidiaries and local dealers will always provide the advice you need to find the product that suits you best. Discover our dealer network and find your local dealer.





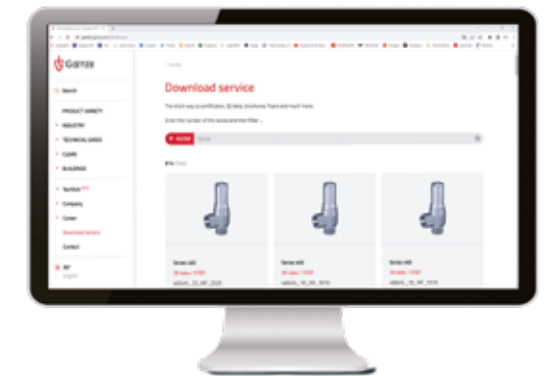
# INTERNET SERVICE OF GOETZE

## DESIGN AND CALCULATION OF SAFETY VALVES

With the help of our design programme and with the certified discharge number as well as the narrowest flow diameter of our safety valves, the valve suitable for discharging the required volume can be determined according to AD regulation A2-2000, in accordance with the international and European standard DIN EN ISO 4126, API 520 and ASME BPVC-VIII. Our experts offer you competent advice on the optimal and economical sizing of your valve.

## DOWNLOAD SERVICE

The short route to data sheets, installation instructions, certificates, brochures, flyers and much more. Easy to find via our website in the "Service" section.



## MOBILE WEBSITE

Our website is also available in a version optimised for smart phones. As usual, you may find your products simply and easily – also when you are out and about.

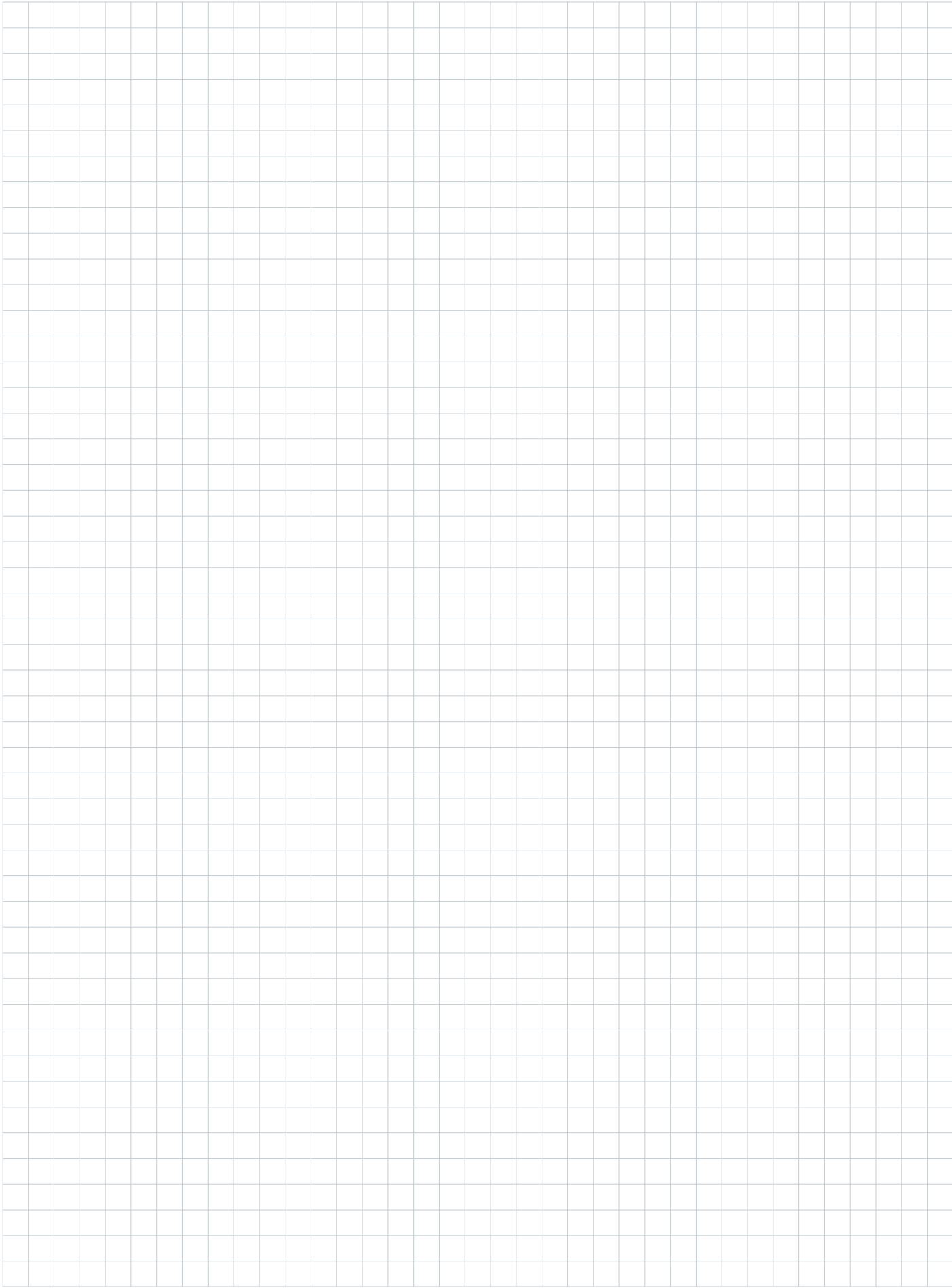
Curious? Just take a look!

**[www.goetze-group.com](http://www.goetze-group.com)**

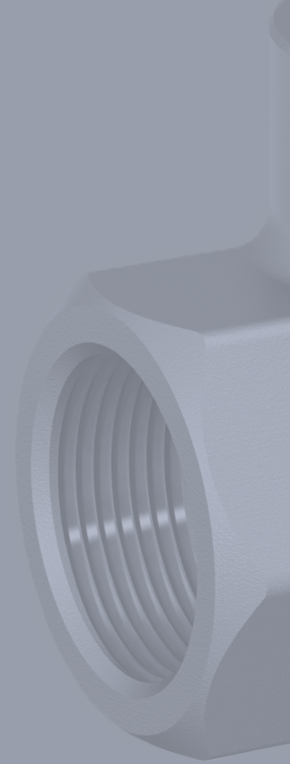
# NOTES



# NOTES







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