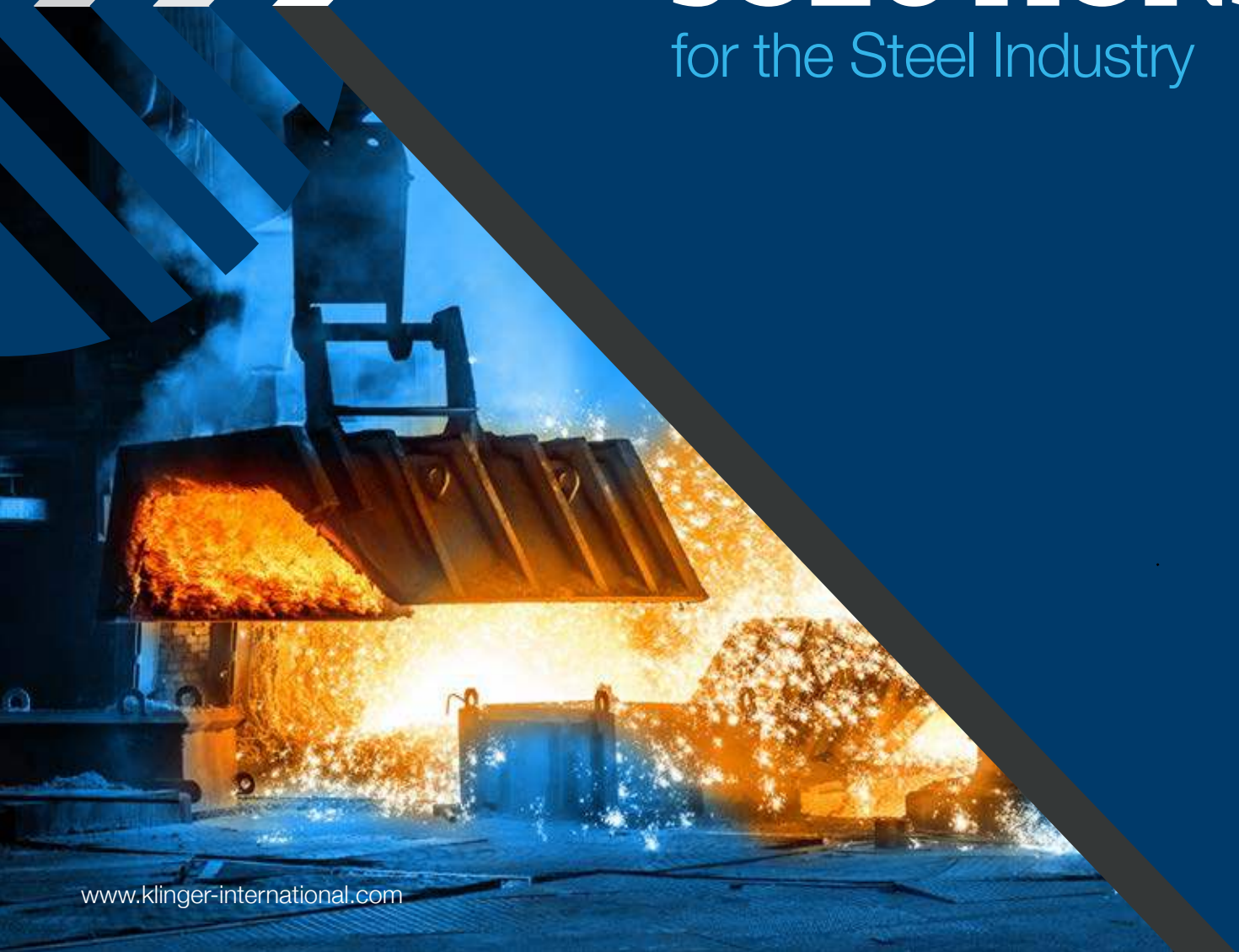
KLINGER
trusted. worldwide.

SOLUTIONS
for the Steel Industry



www.klinger-international.com

KLINGER GROUP

Visionary by Tradition



KLINGER is the world's leading manufacturer and provider of industrial gaskets and valves.

Formed in 1886 as a family enterprise, the pioneers in gasket technology today present themselves as a globally active corporate group. Independent global manufacturing, sales and service companies offer unique know-how and competent on-site consultancy services from a total of 60 countries worldwide.

Our customers comprise leading companies of the manufacturing, infrastructure, automotive, marine, oil & gas, chemical, pulp & paper, food & beverage, and pharmaceutical industries, and of the energy sector. KLINGER employs around 2,600 people worldwide with total annual sales of around 635 million euros.

€ 635 MIO. ANNUAL SALES

Revenues of 635 million euros are generated by the KLINGER Group each year.

2,600 EMPLOYEES

Our global workforce numbers 2,600 people worldwide.

80 COUNTRIES

The KLINGER Group has already exported to almost half the countries in the world.

18 PRODUCTION SITES

The KLINGER Group gaskets, valves, instrumentation products, expansion joints, and hoses are manufactured in a host of locations.

60 COUNTRIES

The KLINGER Group subsidiaries and representatives are at home all over the world.



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STEEL MILL

Steelmaking Process – Conventional

A steel mill is an industrial facility where raw materials such as iron ore, coal, and limestone are transformed into steel. The steelmaking process typically involves several stages, including the production of pig iron, the refining of molten iron into steel, and the shaping and finishing of steel products.

The steel produced by a steel mill is a crucial material that is used in a wide range of industries, including construction, transportation, and manufacturing. Steel is prized for its strength, durability, and versatility. It is a key component in many of the products and structures that we rely on every day, from cars and bridges to skyscrapers and appliances.

These complex and highly automated facilities require specialized equipment, skilled workers, and careful management to operate efficiently and safely. They play a vital role in the global economy, providing the raw materials and finished products that enable modern society to function and thrive.

SURFACE TREATMENT

Steel surfaces are treated to be protected against corrosion and to produce decorative effects. This is achieved by applying metallic, inorganic or organic coatings. Surface-treated steel products in the form of strips, sheets and profiles are principally used in the automotive, building, household appliance and packaging industries.

ANNEALING LINE

The material hardened during cold rolling must be recrystallized to restore the forming properties for further processing in batch annealing or continuous annealing lines. To ensure that the surface quality achieved during cold rolling is retained, annealing must be carried out in an inert atmosphere or under oxygen exclusion to prevent oxidation. Batch annealing involves several coils being stacked on a base and annealed below a hood for about of 2 – 3 days. Continuous annealing lines permit flexible cycles with higher heating and cooling rates as are necessary for heat treating high-strength steel grades, among others.

COLD ROLLING MILL

Hot-rolled strip is rolled even thinner by means of cold rolling at room temperature. Adjustments made during this process result in the desired mechanical properties of the strip.

HOT ROLLING MILL

Slab casting is followed by hot rolling. The semi-finished steel slabs are taken from the depot and then reheated to about 1,250 °C. The thickness can be reduced as defined by setting the pressure in the roll gap of the hot rolling mill accordingly. The volumes of the slabs remain constant. They only change in length and width.

SINTER PLANT

Sintering is carried out in strand sintering plants with strand widths of over 4 m and lengths of over 100 m. During the sintering process, a mixture of ore fines, coke breeze, additives, recycling materials and return fines is placed on a traveling grate, called the sintering strand, and the coke breeze on the surface is ignited in an ignition furnace by gas flames. Gas or air is sucked down through the mixture by a fan. A flame front thus passes over the approx. 500 mm-thick layer, causing caking of the mixture to create coarse lumps of ore.

COKING

The coking process consists of heating coking coal to around 1,000-1,100 °C in the absence of oxygen to drive off the volatiles (pyrolysis). This process results in a hard porous material – coke. Coke is produced in a coke battery, which is composed of many coke ovens arranged in rows into which coal is loaded.

BLAST FURNACE

Hot air (at 1,200 °C) is injected into the lower part of the blast furnace, where the carbon in the coke is gasified with the oxygen in the air to produce the reducing gas carbon monoxide, generating temperatures of up to 2,200 °C. This gas rises, binding the oxygen in the iron oxides and producing carbon dioxide, thus reducing the ore. The rising gases heat the charge above them. The impurities in the input material form a liquid slag and can thus be separated out. Hot metal and slag pool in the lower area of the furnace and exit it at a temperature of about 1,500 °C via a tap hole there. The hot metal and slag are separated in a refractory-lined runner system and directed to the hot metal torpedo ladle and the slag ladle.

STEEL MILL

Pig iron contains unwanted elements such as carbon, silicon, sulfur and phosphorus. They are removed in an oxygen steel converter by injecting oxygen, whereby the impurities are oxidized and floated on the liquid metal bath as slag. This blowing process generates a lot of heat. The converter is therefore loaded with up to 25% scrap in order to lower the reaction heat. The addition of lime supports slag formation. The slag and pig iron are then separated. The converter is tilted for this purpose. The molten steel is guided into a steel ladle via the tap hole. The slag is retained in the converter and reutilized.

REHEATING FURNACE

Reheating furnaces are used in hot rolling mills to heat the steel stock (billets, blooms or slabs) to the rolling temperatures of around 1,200 °C for plastic deformation of the steel. The heating process is continuous. The stock is loaded at the furnace entrance, heated in the furnace, and discharged at the exit. Heat is transferred to the steel stock mainly by means of convection and radiation from the burner gases and the furnace walls.

PRODUCT OVERVIEW

Steelmaking Process – General Media

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	FLUIDS	COMPRESSION PACKINGS	GASKETS	VALVES	EXPANSION JOINTS	INSTRUMENTATION
General media	**Cooling water**	**K1140 GFO®**	**KLINGERSIL C-4400** **KLINGERSIL C-4430**	Butterfly valves **KKD83** Gate valves **KSD** Globe valves **KAD** Check valves **KRC, KRG, KRD** Ball valves **INTEC K200, K211, K221** Nozzle check valves	**Metal expansion joints (single / universal designs)** Where pressure & temperature exceed rubber joint properties. Welding ends (KB) Flanged – fixed (SF) Flanged – loose (DF) All types of hardware i.e. tierods, hinges and gimbals can be scoped. **Rubber expansion joints** Used with temperature lower than 110°C & pressure up to 16 barG.	Instrumentation
	Hot water	**K1140 GFO®**	**KLINGER PSM** **KLINGERSIL C-4430**	Butterfly valves **KKD** Globe valves **KAD** Ball valves **Ballostar KHA, KHD, black material** **INTEC K200, K220-DE** Check valves **KRC, KRG, KRD** Nozzle check valves	**Metal expansion joints (single / universal designs)** Welding ends (KB) Flanged – fixed (SF) Flanged – loose (DF) All types of hardware i.e. tierods, hinges and gimbals can be used.	
	Steam	**K1140 GFO®**	**KLINGER PSM** **KLINGER Spiroflex** **KLINGER Kammprofile Gaskets**	Piston valves **KVN** Steam traps **Armstrong** Ball valves **Ballostar KHA** **INTEC KK200, K204, K214, K211, K221** Safety valves, pressure-reducing valves, globe valves **KAD**	**Metal expansion joints (single / universal designs)** Welding ends (KB) Flanged – fixed (SF) Flanged – loose (DF) All types of hardware i.e. tierods, hinges and gimbals can be used.	Relflex level gauges **KLINGER R, K** Transparent level gauges **KLINGER T**
	Condensate	**K3400** (carbon fiber)	**KLINGER PSM**	Condensate pumps **Armstrong, Strainers** Piston valves **KVN** Sight flow indicators	**Metal expansion joints (single / universal designs)** Welding ends (KB) Flanged – fixed (SF) Flanged – loose (DF) Lens type (carbon steel / stainless steel depending on pressure & temperature) All types of hardware i.e. tierods, hinges and gimbals can be used.	Magnetic level gauges Reflex level gauges **KLINGER R, K**
	Air	**K1140 GFO®**	**KLINGERSIL C-4400**	Ball valves **Ballostar KHA, KLINGER Ball-O-Top, KHD** **INTEC K200**	**Fabric expansion joints** (for high temperature & low pressure) **Rubber expansion joints** **Metal expansion joints (single / universal designs)** Welding ends (KB) Flanged – fixed (SF) Flanged – loose (DF) Rectangular	Pressure control equipment

PRODUCT OVERVIEW

Steelmaking Process – Conventional

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PROCESS STEP	FLUIDS	COMPRESSION PACKINGS	GASKETS	VALVES	EXPANSION JOINTS	INSTRUMENTATION
Sintering plant	**General media**	See products on pages **6** and **7**				
Coking plant	**Coke gas**	**K1140 GFO®** **K1121** (pure PTFE) **K3222** **K290**	**KLINGERSIL C-4430**	Gate valves **KSD** Ball valves **Ballostar KHA**	**Metal expansion joints (single / universal designs)** Welding ends (KB) Flanged – fixed (SF) Flanged – loose (DF) PBE / IPB MEJ Cross-over types All types of hardware i.e. tierods, hinges and gimbals can be used. Materials are typical high nickel alloys such as Inconel 625 or Incoloy 825H etc.	
	Natural gas			Ball valves **Ballostar GKHA** **INTEC K200, K210, K220**		
	Sulfuric acid		**KLINGER TopChem 2003**	**Stainless steel ball valves** Ball valves **INTEC K200**		
Blast furnace	**Hot air (hot blast stove)**	**K3400** (carbon, not for oxygen service) **K1140 GFO®** **K1121** (pure PTFE) **K3222, K322W** (W=Inconel wired)	**KLINGER PSM** **KLINGER Spiroflex**	Butterfly valves **KKD** (metal sealing)	**Metal expansion joints (single / universal designs)** Welding ends (KB) Flanged – fixed (SF) Flanged – loose (DF) PBE / IPB MEJ Crossover types FCCUs types All types of hardware i.e. tierods, hinges and gimbals can be used. Materials are typical high nickel alloys such as Inconel 625 or Incoloy 825H etc. For low-pressure gas lines only, fabric expansion joints can also be used.	
	Oxygen (blower center)	Oxygen valves require no silicone lubricant	**KLINGERSIL C-4400**			
	Blast furnace gas (gas washer)	**K3400** (carbon, not for oxygen service) **K1140 GFO®** **K1121** (pure PTFE) **K3222, K322W** (W=Inconel wired)	**KLINGERSIL C-4430** **KLINGER PSM**	Ball valves **Ballostar KHA** **Ballostar KHI** **INTEC K200, K210, K220**		
	Nitrogen		**KLINGERSIL C-4430**	Ball valves **Ballostar KHA, Ballostar KHE,** **Ballostar KHI, KHD** **INTEC K200, K210, K220**		
Steel mill	**Cooling water for cleaning**	**K3400** (carbon, not for oxygen service) **K1140 GFO®** **K1121** (pure PTFE) **K3222, K322W** (W=Inconel wired)	**KLINGERSIL C-4400**	Ball valves **KHD** **INTEC K200** Butterfly valves **KKD**	**Rubber expansion joints** can be used for water cooling systems below 110°C. **Metal expansion joints** can be used for water cooling systems above 110°C.	

PRODUCT OVERVIEW

Steelmaking Process – Conventional

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PROCESS STEP	FLUIDS	COMPRESSION PACKINGS	GASKETS	VALVES	EXPANSION JOINTS	INSTRUMENTATION
Steel mill	Natural gas (converter)	**K3400** (carbon, not for oxygen service) **K1140 GFO®** **K1121** (pure PTFE) **K3222, K322W** (W=Inconel wired)	**KLINGERSIL C-4400** **KLINGERSIL C-4430**	Ball valves **Ballostar GKHA, Ballostar GKHI** **INTEC K200, K210, K220**	**Metal expansion joints (single / universal designs)** Welding ends (KB) Flanged – fixed (SF) Flanged – loose (DF) All types of hardware i.e. tierods, hinges and gimbals can be used.	
	Process gas (ladle furnace)			Ball valves **Ballostar GKHA, Ballostar GKHI, KHD** **INTEC K200, K210, K220**		
	Argon (vacuum plant)					
	Nitrogen (continuous casting)					
	Oxygen	Oxygen valves require no silicone lubricant		Ball valves **Ballostar KHA, Ballostar KHI** **INTEC K200, K210, K220**		
Reheating furnace	Natural gas, coke gas (push oven)	**K3400** (carbon, not for oxygen service) **K1140 GFO®** **K3222, K322W** (W=Inconel wired)	**KLINGERSIL C-4430**	Ball valves **Ballostar GKHA, Ballostar GKHI, KHD** **INTEC K200, K210, K220**	**Metal expansion joints (single / universal designs)** Welding ends (KB) Flanged – fixed (SF) Flanged – loose (DF) All types of hardware i.e. tierods, hinges and gimbals can be used.	Transparent level gauges **KLINGER TA**
	Natural gas, coke gas (walking beam oven)					
Hot rolling mill	Natural gas, coke gas, water	**K3400** (carbon, not for oxygen service) **K1140 GFO®** **K3222, K322W** (W=Inconel wired)	**KLINGERSIL C-4430**	Ball valves **Ballostar GKHA, Ballostar GKHI, KHD** **INTEC K200, K210, K220**	**Metal expansion joints (single / universal designs)** Welding ends (KB) Flanged – fixed (SF) Flanged – loose (DF) All types of hardware i.e. tierods, hinges and gimbals can be used.	
Cold rolling mill	General media	See products on pages **6** and **7**				
Annealing line	General media	See products on pages **6** and **7**				
Surface finishing	General media	See products on pages **6** and **7**				
	Hydrochloric acid		**KLINGER VSP PITA®**			

STEEL MILL

Green Steel Production Process

A green steel mill is a steel manufacturing facility that uses sustainable production methods to reduce its impact on the environment and minimize greenhouse gas emissions.

There are several ways that steel mills can become green. One approach is to use renewable resources, such as wind or solar power, to provide the electricity needed for the steelmaking process. Another approach is to use alternative feedstocks, such as scrap metal or biofuels instead of traditional raw materials like iron ore and coal. These alternative feedstocks can significantly reduce the greenhouse gas emissions associated with steel production.

The development of green steel mills is an important step towards a more sustainable and environmentally friendly steel industry. As concerns about climate change continue to grow, there is a growing demand for low-carbon steel products, and green steel plants are helping to meet that demand.

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DIRECT REDUCED IRON UNIT – DRI

Direct reduction produces no liquid hot metal because the process operates at lower temperatures than a blast furnace. The ores are only exposed to oxygen, and the gangue content of the ores remains in the sponge iron (DRI or HBI). In most direct reduction processes, the reducing gas is produced by reforming natural gas into hydrogen and carbon monoxide. Sponge iron is mainly used for steel production in electric arc furnaces.

ELECTRIC ARC FURNACE

Steels based on scrap are melted in electric arc furnaces. The electric arc converts the electrical energy into heat to melt the steel very efficiently and with high energy density. Apart from scrap, charges can also consist of sponge iron (DRI or HBI) and / or liquid or solid pig iron. Basically, any type of steel can be produced via the electric arc furnace route.

STEEL MILL

Pig iron contains unwanted elements such as carbon, silicon, sulfur and phosphorus. They are removed in an oxygen steel converter by injecting oxygen, whereby the impurities are oxidized and floated on the liquid metal bath as slag. This blowing process generates a lot of heat. The converter is therefore loaded with up to 25% scrap in order to lower the reaction heat. The addition of lime supports slag formation. The slag and pig iron are then separated. The converter is tilted for this purpose. The molten steel is guided into a steel ladle via the tap hole. The slag is retained in the converter and reutilized.

SURFACE TREATMENT

Steel surfaces are treated to be protected against corrosion and to produce decorative effects. This is achieved by applying metallic, inorganic or organic coatings. Surface-treated steel products in the form of strips, sheets and profiles are principally used in the automotive, building, household appliance and packaging industries.

ANNEALING LINE

The material hardened during cold rolling must be recrystallized to restore the forming properties for further processing in batch annealing or continuous annealing lines. To ensure that the surface quality achieved during cold rolling is retained, annealing must be carried out in an inert atmosphere or under oxygen exclusion to prevent oxidation. Batch annealing involves several coils being stacked on a base and annealed below a hood for about of 2 – 3 days. Continuous annealing lines permit flexible cycles with higher heating and cooling rates as are necessary for heat treating high-strength steel grades, among others.

REHEATING FURNACE

Reheating furnaces are used in hot rolling mills to heat the steel stock (billets, blooms or slabs) to the rolling temperatures of around 1,200 °C for plastic deformation of the steel. The heating process is continuous. The stock is loaded at the furnace entrance, heated in the furnace, and discharged at the exit. Heat is transferred to the steel stock mainly by means of convection and radiation from the burner gases and the furnace walls.

COLD ROLLING MILL

Hot-rolled strip is rolled even thinner by means of cold rolling at room temperature. Adjustments made during this process result in the desired mechanical properties of the strip.

HOT ROLLING MILL

Slab casting is followed by hot rolling. The semi-finished steel slabs are taken from the depot and then reheated to about 1,250 °C. The thickness can be reduced as defined by setting the pressure in the roll gap of the hot rolling mill accordingly. The volumes of the slabs remain constant. They only change in length and width.

MELTING UNIT

Part of the DRI unit, where required. For example when the DRI unit and the steel mill are located in different regions or even countries.

PRODUCT OVERVIEW

Green Steel Production Process

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PROCESS STEP	FLUIDS	COMPRESSION PACKINGS	GASKETS	VALVES	EXPANSION JOINTS	INSTRUMENTATION
Direct reduced iron unit – DRI	**General media**	See products on pages **6** and **7**				
Melting unit	**Hydrogen**		**KLINGERSIL C-4430**	Ball valves **Ballostar KHA** **INTEC K200 ff, K800 ff**	All metal expansion joints with 316L can be used depending on temperature & pressure.	
Electric arc furnace	**Oxygen**	Oxygen valves require no silicone lubricant	**KLINGERSIL C-4400**	Ball valves **Ballostar KHA, Ballostar KHI** **INTEC K200, K210, K220**	All metal expansion joints with 316L can be used depending on temperature & pressure.	
Steel mill	**Natural gas (converter)**	**K3400** (carbon, not for oxygen service) **K1140 GFO®** **K1121** (pure PTFE) **K3222, K322W** (W=Inconel wired)	**KLINGERSIL C-4400** **KLINGERSIL C-4430**	Ball valves **Ballostar GKHA, Ballostar GKHI** **INTEC K200, K210, K220**	**Metal expansion joints (single / universal designs)** Welding ends (KB) Flanged – fixed (SF) Flanged – loose (DF) All types of hardware i.e. tierods, hinges and gimbals can be applied.	
	Process gas (ladle furnace)			Ball valves **Ballostar GKHA, Ballostar GKHI, KHD** **INTEC K200, K210, K220**		
	Argon (vaccum plant)					
	Nitrogen (continuous casting)			Ball valves **Ballostar KHA, Ballostar KHI, KHD** **INTEC K200, K210, K220**		
	Oxygen	Oxygen valves require no silicone lubricant	**KLINGERSIL C-4400** **KLINGERSIL C-4430**	Ball valves **Ballostar KHA, Ballostar KHI** **INTEC K200, K210, K220**		
	Cooling water for cleaning	**K3400** (carbon, not for oxygen service) **K1140 GFO®** **K1121** (pure PTFE) **K3222, K322W** (W=Inconel wired)	**KLINGERSIL C-4400**	Ball valves **Ballostar KHA, Ballostar KHI, KHD** **INTEC K200, K210, K220** Butterfly valves **KKD**	**Rubber expansion joints** can be used for water cooling systems below 110°C. **Metal expansion joints** can be used for water cooling systems above 110°C.	
Reheating furnace	**Natural gas, coke gas (push oven)**	**K3400** (carbon, not for oxygen service) **K1140 GFO®** **K3222, K322W** (W=Inconel wired)	**KLINGERSIL C-4430**	Ball valves **Ballostar GKHA, Ballostar GKHI, KHD** **INTEC K200, K210, K220**	**Metal expansion joints (single / universal designs)** Welding ends (KB) Flanged – fixed (SF) Flanged – loose (DF) All types of hardware i.e. tierods, hinges and gimbals can be used.	Transparent level gauges **KLINGER TA**
	Natural gas, coke gas (walking beam oven)					

PRODUCT OVERVIEW

Green Steel Production Process

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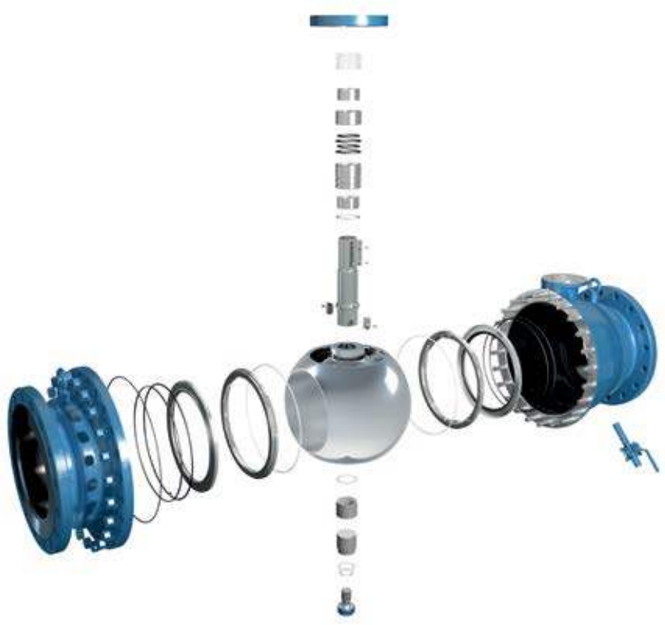
PROCESS STEP	FLUIDS	COMPRESSION PACKINGS	GASKETS	VALVES	EXPANSION JOINTS	INSTRUMENTATION
Hot rolling mill	Natural gas coke gas water	**K3400** (carbon, not for oxygen service) **K1140 GFO®** **K3222, K322W** (W=Inconel wired)	**KLINGERSIL C-4430**	Ball valves **Ballostar GKHA, Ballostar GKHI, KHD**	**Metal expansion joints (single / universal designs)** Welding ends (KB) Flanged – fixed (SF) Flanged – loose (DF) All types of hardwares i.e. tierods, hinges and gimbals can be used.	
Cold rolling mill	General media	See products on pages **6** and **7**				
Annealing line	General media	See products on pages **6** and **7**				
Surface finishing	General media	See products on pages **6** and **7**				
	Hydrochloric acid		**KLINGER VSP PITA®**			

KLINGER BALLOSTAR BALL VALVE KHI

WITH THE UNIQUE KLINGER ELASTIC SEALING SYSTEM

The KLINGER Ballostar KHI ball valves are designed to meet even the most stringent requirements and are guaranteed to comply with future standards in terms of tensile, compressive, and bending stresses. One of the unique features of Ballostar® KHI is its sealing system, which ensures exceptional performance. The ball valve housing also comes with a test and drain valve, which enables the pressure to be relieved without having to open the pipeline when the ball is closed. This is a significant advantage as it allows for leak testing at any time. These ball valves are suitable for a wide range of applications, including underground district heating pipes, buried pipelines, cogeneration plants, pump stations, steelworks, hydroelectric power stations, and tunnel boring machines.





GREATEST GUARANTEED FIRE SAFETY

The ball valve can be used for fire safe applications and is certified in accordance with API Standard 607 and EN ISO 10497 by Lloyd's Register and TÜV Austria, respectively.

DOUBLE BLOCK & BLEED

With the DBB function you only need one KLINGER Ballostar KHI ball valve instead of two separate valves. This alternative solution not only saves time and money, but is especially useful for installations with limited space.

TA-LUFT (VDI 2440)

The KLINGER Ballostar KHI is significantly below prescribed emission limits for keeping air clean. Certified emission testing pursuant to VDI 2440 for Ballostar KHI/ KHSVI ball valves at temperatures < 250 °C.

GAS APPROVAL

ÖVGW certificate for authorization to display the ÖVGW quality label "Gas" for the ball valves GKHI, GKHSVI and GKHSVI VVS, DN 150 - 800.

USE WITH GASEOUS OXYGEN

The BAM Berlin has approved the Ballostar KHI ball valve series for applications with gaseous oxygen at operating pressures of up to 16 bar and operating temperatures of up to 60 °C.



KLINGER BALLOSTAR BALL VALVE KHA

BENEFITS / PROPERTIES

One product – many applications
3-piece body, many connection types (flanged, welded, threaded), full bore, DN15-DN125, unique KLINGER sealing system, serviceable without removal, various materials (cast iron, steel, rust- and acid-proof cast iron, duplex)

SPECIFICATIONS

Standard antistatic
Improved corrosion protection KACP
Up to +400 °C (metal seat)
Cryogenic version (down to -196 °C)
Fire-safe
Fugitive emissions – complies with "TA-Luft" and ISO 15848
Leakage rate A
Bidirectional flow
Oxygen service
Natural gas service (GKHA) / DBB design
Vacuum version / regulatory design with V-port ball



KLINGER BALLOSTAR BALL VALVE KHE

BENEFITS / PROPERTIES

2-piece body, flanged ball valve optimized for the process industry. Due to the 2-piece body design, the risk of external leakage is reduced because there is just one sealing area between body and flanged end piece. Entire ball valve range produced in EN standard (short pattern) and ANSI standard (CL150).

SPECIFICATIONS

Standard antistatic
Fire-safe
"TA-Luft"
Leakage rate A
Oxygen service
Natural gas service
Gas distribution systems with up to 16 bar



KLINGER PISTON VALVE KVN

BENEFITS / PROPERTIES

KLINGER KVN series piston valves with hand wheel for flow media such as steam, water and standard gases. Piston valves can be used as control or shut-off valves. The piston valve has a unique graphite seat system which allows its use in contaminated media replacing globe valves, for example. Welded, threaded or flanged valve connection.

SPECIFICATIONS

Fire-safe
Valve for oxygen service
Valve on the basis of "TA Luft"
Emission testing as per ISO 15848
Valve materials: stainless steel, carbon steel and cast iron
EN pressure classes PN16-63 and ANSI classes 150 and 300



KLINGER BALL VALVE KHD

BENEFITS / PROPERTIES

KLINGER KHD series ball valves for general applications, e.g. different materials for water, air and most standard process media such as pulp and other non-burning gases and liquids. As standard with lockable handle. Ball valves feature RPTFE seats, full bore; 3-piece design. Welded, threaded or flanged valve connection.

SPECIFICATIONS

Available in materials CF8M and carbon steel. Valve meets the two standards of pressure class PN50 and ANSI class 300. Standard sizes DN10-100 (3/8"-4"), but up to DN600 (24") optionally available.



KLINGER BALL VALVE KHD

BENEFITS / PROPERTIES

KLINGER KHD series ball valves for general applications, e.g. different materials for water, air and for most standard process materials such as pulp and other non-burning gases and liquids. As standard with lockable handle. Ball valves feature RPTFE seats, full bore; 2-piece design. Flanged connection.

SPECIFICATIONS

Available in material CF8M. EN pressure classes PN10-40 and ANSI classes 150 and 300. Standard sizes DN25-300 (1"-12") but sizes up to DN600 (24") optionally available.



SAFETY VALVE

BENEFITS / PROPERTIES

Safety valves protect the process vessels and pipes from high pressure peaks. Safety valves can be divided into two categories: capacitive safety valves, which are always sized for a specific process or parts thereof, and expansion safety valves where the valve's maximum flow rate is defined by the opening pressure.

SPECIFICATIONS

Valve materials ranging from carbon steel to titanium can be selected. Different materials can be combined in different parts depending on whether or not the fluid is in contact with valve parts. Different operating temperatures have an effect on whether the bonnet has to be open or closed. Manual operating lever for valves available.

INTEC DUOBALL BALL VALVE

DESIGNED FOR APPLICATIONS WITH EXTREMELY HIGH SAFETY REQUIREMENTS

The INTEC Duoball ball valve developed by KLINGER Schöneberg features double and independent shutoff of the pipeline, which significantly increases operating safety and reliability. The safety factor could thus be increased fourfold compared to standard ball valves. In addition, the design has several connection options in the space between the two closures. These are used for monitoring and ventilation purposes. This configuration provides the best technology for the most stringent isolation needs where double block-and-bleed is required. Due to the double isolation-and-bleed function, every Duoball valve offers bidirectional tightness and usability.





CONFIGURATION

Like all ball valves of the INTEC series, the Duoball valve is available with floating ball or trunnion-mounted ball as well as with soft or metal seats. All ball seat systems are classified as leakage rate A in accordance with EN 12266 and are absolutely gastight.

DESIGN

The design is based on the integration of two ball valves in one body. The INTEC Duoball ball valve also is available in the same length as a standard valve in accordance with EN 588 R1 and provides a compact and economical alternative to using multiple valves. The INTEC Duoball has the smallest possible body cavity and the inlet and outlet connections enable the body cavity to be flushed.

OPTIONS

Leakage monitoring
Pressure monitoring
Flushing connection
Nitrogen pressure overlay
Connection for a pressure-relief safety valve



FLOATING BALL VALVE — INTEC K200

BENEFITS / PROPERTIES

2-piece high-end floating ball valves with proven design and perfect technical functionality for safe shutoff. The ball valves are available in various material combinations and with different features.

SPECIFICATIONS

DN 15 - DN 200 (NPS 1/2" - NPS 8")
PN 16 - PN 40 (Cl. 150 - Cl. 300)
Soft seats, fixed seat rings on both ends
Available in stainless steel and carbon steel.
Special materials optionally available
Fire-safe
Leakage rate A
Stuffing box system fully resistant to aging and fugitive emissions
Certified in accordance with "TA-Luft" and ISO 15848
Options: INTEC K220 spring-loaded seat rings on one end specifically for temperature and pressure changes. INTEC K221 with metal seats



TRUNNION-MOUNTED BALL VALVE — INTEC K211

BENEFITS / PROPERTIES

2-piece trunnion-mounted ball valves with spring-loaded seat rings on both ends. Trunnion-mounted ball valves are effective in both low- and high-pressure situations. In low- or no-pressure situations, the spring-loaded seats create a seal. The valve also is suitable for high-pressure applications.

SPECIFICATIONS

DN 15 - DN 500 (NPS 1/2" - NPS 20")
PN 16 - PN 420 (Cl. 150 - Cl. 2500)
Soft and metal seats
Up to +800 °C (metal seat)
Spring-loaded seat rings on both ends
Available in stainless steel and carbon steel.
Special materials optionally available
Cryogenic version (down to -196 °C)
Wide range of sealing materials
Fire-safe
Leakage rate A
Stuffing box system fully resistant to aging and fugitive emissions
Certified in accordance with "TA-Luft" and ISO 15848



HIGH-PRESSURE BALL VALVE — INTEC K811

BENEFITS / PROPERTIES

3-piece high-pressure ball valve of the modular INTEC system technology. High-precision bearings and spring loaded seat ring elements on both ends ensure safe handling in all applications in the high-pressure range.

SPECIFICATIONS

DN 15 - DN 200 (NPS 1/2" - NPS 8")
PN 16 - PN 500 (Cl. 150 - Cl. 4500)
Soft and metal seats
Up to +800 °C (with metal seat)
Spring-loaded seat rings on both ends
Available in stainless steel and carbon steel.
Special materials optionally available
Cryogenic version (down to -196 °C)
Wide range of sealing materials
Fire-safe
Leakage rate A
Stuffing box system fully resistant to aging and fugitive emissions
Certified in accordance with "TA-Luft" and ISO 15848



PRESSURE-RELIEF BALL VALVE — INTEC K220-DE

BENEFITS / PROPERTIES

The pressure-relief ball valve is used to ensure safe handling of critical and expanding media such as propane, butane, methane, ammonia, etc. Spring-loaded seat rings on both ends. The upstream seat is pushed back by the pressure in the cavity that is 2 bar higher, resulting in the pressure in the cavity always being relieved upstream. The ball valve has a bidirectional design, thus preventing incorrect installation during maintenance.

SPECIFICATIONS

Available in stainless steel, carbon steel and special materials such as Duplex, Super Duplex, Hastelloy B2/ C4/ C276, titanium, zirconium, Monel, nickel etc.
EN pressure classes PN16 - 40 and ANSI classes 150 - 600.
Standard sizes DN 15 - 200 (1/2"-8").



MULTI-PORT BALL VALVE — INTEC K410

BENEFITS / PROPERTIES

The universal, multi-port trunnion-mounted ball valve in the unit design system of the INTEC series. With 3-, 4- or 5-way applications, the safety of your flow medium is ensured. The 3-way ball valves are ideal for mixing or distributing media, but also for shutting off side channels.

SPECIFICATIONS

Stainless steel and carbon steel. Special materials such as Duplex, Super Duplex, Hastelloy B2/C4/C276, titanium, zirconium, Monel, nickel etc. are available.
EN pressure classes PN16 - 160 and ANSI classes 150 - 900. Standard sizes DN15 - 150 (1/2"-6").
Higher pressure ratings, temperatures and different face-to-face dimensions optionally available. Ball with T-pattern or L-pattern flow.



ON-OFF FREE-FLOW VALVE — SERIES VPFL

BENEFITS / PROPERTIES

Pneumatic valve angle seat with high flow coefficient, solid construction and compact design. Versatility due to stainless steel design for use in harsh environments. Can be used in various industries such as textile dyeing and finishing plants, chemical plants, water treatment facilities, food industry, and general industrial plants. All Burocco valves are delivered following testing and calibration, and are ready for extended, maintenance-free use.

SPECIFICATIONS

Sizes: DN 15 - 150
Rating: PN 16 (15 - 150)
Connections: FLANGE DRILLING PN 16 (15-32)
FLANGE UNI PN 10/16 (40-150)
Plug characteristic: Disc
Actuator: Pneumatic with piston
Supply pressure: min 4 / max 8 bar
Temperature: from -30 to +180 °C



KLINGER CHECK VALVE KRC

BENEFITS / PROPERTIES

KLINGER KRC series check valves are suitable for different substances. Water, air and for most standard process media such as pulp and other non-burning gases and liquids. Check valves feature metal seats and are installed between flanges.

SPECIFICATIONS

Valve materials CF8M. Pressure classes PN10-40 and ANSI classes 150 and 300. Special materials AISI317 and SMO for bleaching applications also available. Standard sizes DN50-600 (2”-24”), but up to DN1000 (20”) optionally available.



KLINGER CHECK VALVE KRG

BENEFITS / PROPERTIES

KLINGER KRG series check valves are suitable for different media, e.g. water, air and for most standard process substances such as pulp and other non-burning gases and liquids. Check valves feature metal seats (PTFE seat available) and are installed between flanges.

SPECIFICATIONS

Valve materials CF8M. Pressure classes PN10-40 and ANSI classes 150 and 300. Standard sizes DN10-100 (3/8”-4”).



SIGHT FLOW INDICATOR

BENEFITS / PROPERTIES

Sight flow indicators are added to the process line to check for flow in the pipeline. For gaseous materials the flow is normally shown by a spinner behind the sight glass.

SPECIFICATIONS

Materials for sight flow indicators are carbon and stainless steel, but special materials are also available.



KLINGER BUTTERFLY VALVE KKD

BENEFITS / PROPERTIES

KLINGER KKD82-83 series butterfly valves are suited for different substances. Flow media such as steam, water and standard gases can be controlled or valves can be used as closing valves in different process applications. Fitted with handle or manually operated gear. Butterfly valves feature double or triple offset design (soft or metal seat) and are installed between flanges.

SPECIFICATIONS

Valve materials CF8M (carbon steel available). EN pressure classes PN10-40 and ANSI classes 150 and 300. Standard sizes DN80-600 (3”-24”), but up to DN1200 (48”) optionally available.



KLINGER BUTTERFLY VALVE KKD

BENEFITS / PROPERTIES

KLINGER KKD81 series butterfly valves with EPDM liner suitable for process water and inert gases. Butterfly valves are used as control valves or as a closing valve in different process applications. Fitted with handle or with manually operated gear.

SPECIFICATIONS

Valve material cast iron (carbon steel also available) body. EN pressure classes PN10-25 and ANSI class 150. Different liner materials EPDM, PTFE, NBR, Viton and Hypalon. Standard sizes DN50-600 (2”-24”) but up to DN1200 (48”) optionally available.



STRAINER

BENEFITS / PROPERTIES

The purpose of strainers is to remove solid particles from fluids and protect downstream equipment from contamination, e.g. pumps.

SPECIFICATIONS

Strainers can be used in high- and low-pressure applications. Body material is normally carbon steel or stainless steel, screen is made from stainless steel.



KLINGER SLIDE GATE VALVE KSD

BENEFITS / PROPERTIES

KLINGER KSD series gate valves with handle or manually operated gear suitable for different substances. Flow media such as pulp stock and dispersion waters. Gate valves feature a metal, EPDM or PTFE seat and are installed between flanges.

SPECIFICATIONS

Valve material CF8M (carbon steel also available), EN pressure classes PN10-25 and ANSI class 150. Standard sizes DN50-600 (2”-24”), but up to DN1200 (48”) optionally available.



KLINGER GATE VALVE KSD

BENEFITS / PROPERTIES

KLINGER KSD series gate valves with hand wheel for flow media such as steam, water and standard gases. Gate valves have a metal seat and are flanged, welded or threaded.

SPECIFICATIONS

Valve materials carbon steel and CF8M, ANSI class 800. Higher pressure classes optionally available. Standard sizes DN10-50 (3/8”-2”).



KLINGER GATE VALVE KSD

BENEFITS / PROPERTIES

KLINGER KSD series gate valves with hand wheel or with manually operated gear for flow media such as steam, water and standard gases. Gate valves have metal seat and come with flanges or butt-weld ends.

SPECIFICATIONS

Valve materials carbon steel and CF8M. EN pressure classes PN10-40 and ANSI classes 150 and 300. Higher pressure classes optionally available. Standard sizes DN80-600 (3”-24”), but up to DN1200 (48”) optionally available.



KLINGER GLOBE VALVE KAD

BENEFITS / PROPERTIES

KLINGER KAD series globe valves with hand wheel or with manually operated gear for flow media such as steam, water and standard gases. Globe valves have a metal seat and come with flanges or butt-weld ends.

SPECIFICATIONS

Valve materials carbon steel and CF8M. EN pressure classes PN10-40 and ANSI classes 150 and 300. Higher pressure classes optionally available. Standard sizes DN80-400 (2”-16”).



KLINGER GLOBE VALVE KAD

BENEFITS / PROPERTIES

KLINGER KAD series globe valves with hand wheel for flow media such as steam, water and standard gases. Globe valves have a metal seat and come with flanges, welded or threaded ends.

SPECIFICATIONS

Valve materials carbon steel and CF8M. Pressure class ANSI class 800. Higher pressure classes are optionally available. Standard sizes DN10-50 (3/8”-2”).



KLINGER PLUG VALVE KPZ

BENEFITS / PROPERTIES

KLINGER KPZ series plug valves are suitable for different challenging media such as black liquor and other substances that need a valve with no gap between body and closing element. Fitted with handle or manually operated gear. Plug valves feature RPTFE sleeve, reduced bore, with flanges or welded/threaded ends.

SPECIFICATIONS

Valve materials Duplex, CF8M and carbon steel (Hastelloy also available). Pressure classes ANSI class 150–600. Drillings for PN ratings available. Standard sizes DN15-500 (1/2”-20”) but up to DN700 (28”) optionally available.

CONTROL & ON/OFF VALVES

ACTUATED BALL VALVE



SELECTION

Both pneumatic and electric actuators can be used to automate ball valves. The determination of the customer's required torque saves investment and follow-up costs. Even though the selection of an actuator can be made according to maximum valve torque tolerance, it is highly recommended that the actuator is selected based on actual needs. The required pressure differential determines the torque of the necessary actuator. Ball valves open from 0 to 90 degrees.

CONTROL

As control valves, standard ball valves act more like throttling valves. Ball valves are very good and precise control valves when it is possible to use a V-port ball or segment ball design inside the valve. Their control characteristics can be adjusted exactly to customer needs.





PRESSURE REDUCING VALVE

BENEFITS / PROPERTIES

Pressure reducing valves reduce the inlet pressure to the outlet pressure. Basic models reduce the pressure evenly by using spring force. When the inlet pressure varies, the outlet pressure also varies. Stabilizing the downstream pressure at a constant pressure is possible by adding a pressure connection from the downstream side to the actuator of the reducer.

SPECIFICATIONS

Standard materials for pressure reducing valves are carbon and stainless steel. Flow media usually are gases or fluids which do not contain any coarse materials. Pressure reducing valves are always sized according to process requirements.



BUTTERFLY VALVE WITH ACTUATOR

SELECTION

Both pneumatic and electric actuators can be used to automate butterfly valves. Actuators should be selected in accordance with the needed torque values and the required actuating times. Valves open from 0 to 90 degrees.

CONTROL

As a standard for control valves, butterfly valves are preferred for standard opening ranges of 10-80 degrees from the closed position. There are also special designs available for reducing the cavitation phenomena and modifying control capabilities.



SLIDE GATE VALVE WITH ACTUATOR

SELECTION

Both pneumatic and electric actuators can be used to automate slide gate valves. Actuators should be selected in accordance with the needed torque values and the required actuation times. Operating mode is a linear movement.

CONTROL

Standard gate valves are not suitable for control applications, but there are special ports for controlling fluids and special materials that resist corrosion of the slide.



CONTROL GLOBE VALVE

SELECTION

Control globe valves are usually equipped with pneumatic or hydraulic actuators due to control response times. Control globe valves are the most common type for controlling steam and gas media, but can be used for most fluids. Operating mode is a linear movement.

CONTROL

Control globe valves can be one-step control valves, but several pressure reducing points can additionally be installed inside the valve. This enables a stronger reduction without increasing cavitation and noise.



PNEUMATIC ACTUATOR

BENEFITS / PROPERTIES

Pneumatic actuators are the most common actuators for opening and closing quarter-turn valves. Actuators can use pneumatic operation (DA) or spring force (SR). They can also operate through 180 degrees and with hydraulic oil.

SPECIFICATIONS

Standard pressure in actuator feed (air) is 4.5-6 barG. There are special products for ATEX areas and also products for different safety integrity levels (SIL) according to customer specifications. Some manufacturers also produce actuators from 316 stainless steel when high chemical resistance is required.



ELECTRIC ACTUATOR

BENEFITS / PROPERTIES

Electric actuators come in quarter-turn or multiple-turn designs. Actuation time is slower than pneumatic actuators. Biggest advantage over pneumatic actuators is power. Bigger valves need a strong force to operate. Electric actuators combined with gearing can provide these strong forces.

SPECIFICATIONS

Most actuators use electric power. Different standards for electric power in different countries require knowing the standard before selecting the actuator for a valve. Products are available for ATEX areas and the most known data transfer protocols are supported by actuators from different suppliers.



POSITIONER

BENEFITS / PROPERTIES

The positioner is the control unit of the pneumatically actuated valve. The positioner receives a signal and the actuator then moves the valve to the desired position according to that setpoint.

SPECIFICATIONS

Standard pressure for positioners (air) is 4.5-8 barG. There are special products for ATEX areas as well as products for different safety integrity levels (SIL) according to customer specifications. Customers receive position information. Additionally, the positioner is able to communicate with the automation system using multiple protocols.



LIMIT SWITCH

BENEFITS / PROPERTIES

When valves only move to open and closed positions without controlling fluids in the in-between positions, the valve actuator can be equipped with a device that sends a signal to the automation system when the valve is fully open or closed.

SPECIFICATIONS

Limit switches operate using mechanical or inductive sensors. There are special products for ATEX areas as well as products for different safety integrity levels (SIL) according to customer specifications.



SOLENOID VALVE

BENEFITS / PROPERTIES

The positioner moves the actuator to the valve position that corresponds to the setpoint. The valve actuator can be driven by pressurized air to move the valve to the open or closed position. Special features can be used to move the valve also to the in-between positions to realize additional control functions.

SPECIFICATIONS

Standard pressure for solenoid valves (air) is 4.5-8 barG. There are special products for ATEX areas as well as products for different safety integrity levels (SIL) according to customer specifications.

GASKETS

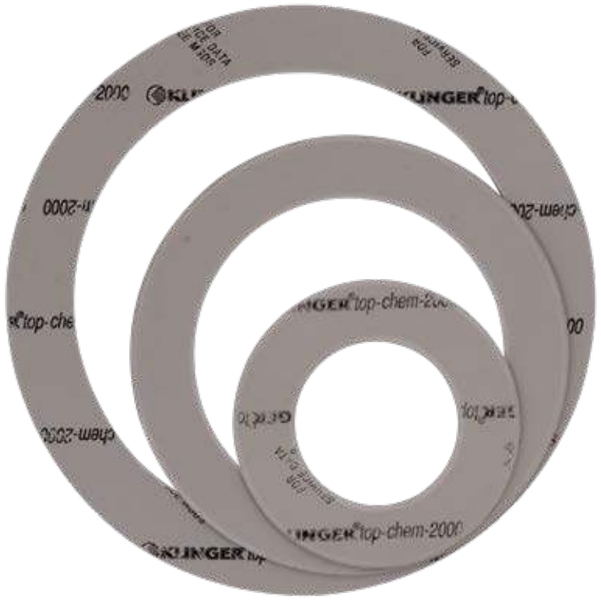
KLINGER TOPCHEM 2000

BENEFITS / PROPERTIES

» The perfect universal gasket for heavy-duty applications
» Manage high temperatures up to 260 °C in combination with high pressure
» The only PTFE gasket with API 6FA fire-safe certificate
» Excellent for all types of aggressive media
» FDA certificate of conformity for food & pharma
» Retained tension force = retorquing not required
» No aging
» No cold flow
» Extreme gas tightness

SPECIFICATIONS

Modified PTFE filled with silicon carbide.
Dimensions of standard sheet: 1,500 x 1,500 mm
Thickness: 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm
Tolerances: Thickness ± 10%, length ± 50 mm, width ± 50 mm
Can be supplied as ring seal gaskets in DIN, ANSI and user-defined dimensions.





KLINGER TOPCHEM 2003

BENEFITS / PROPERTIES

» Suitable for low temperatures and large sealing surfaces
» Excellent for all types of aggressive media
» FDA certificate of conformity for food & pharma
» Retained tension force = retorquing not required
» No aging
» Excellent adaption to poor flange surfaces
» High gas tightness at low torque

SPECIFICATIONS

Modified PTFE filled with hollow glass microspheres. Dimensions of standard sheet: 1500 x 1500 mm. Thickness: 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm.
Tolerances: Thickness ± 10%, length ± 50 mm, width ± 50 mm. Can be supplied as ring seal gaskets in DIN, ANSI, and user-defined dimensions.



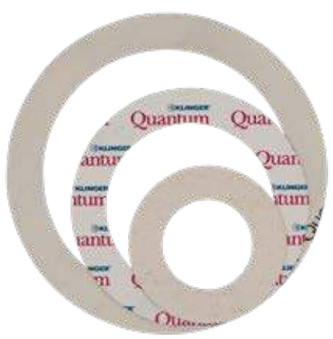
KLINGER TOPCHEM 2006

BENEFITS / PROPERTIES

» Excellent chemical resistance in strong alkaline applications
» FDA certificate of conformity for food & pharma
» Retained tension force = retorquing not required
» No aging
» Very good mechanical properties at medium temperatures

SPECIFICATIONS

Modified PTFE filled with barium sulfate. Dimensions of standard sheet: 1,500 x 1,500 mm.
Thickness: 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm.
Tolerances: Thickness ± 10%, length ± 50 mm, width ± 50 mm.
Can be supplied as ring seal gaskets in DIN, ANSI, and user-defined dimensions.



KLINGER QUANTUM

BENEFITS / PROPERTIES

KLINGER Quantum is the first fiber-reinforced gasket material in the world that exclusively uses HNBR as the binder. Together with a unique production process developed for this purpose, this material can be used at higher temperatures and with a much broader range of media than other fiber-reinforced gasket materials available on the market.

BENEFITS / PROPERTIES

» Handles high temperatures without embrittlement
» Increased service life
» Retained flexibility
» High density at high temperatures
» Suitable for a wide range of media



KLINGER PSM-AS

BENEFITS / PROPERTIES

» Handles 450 °C in continuous operation in combination with high pressure
» Suitable for worn flange surfaces
» Excellent in steam applications
» Does not stick to the flange
» Contains no adhesive
» Perforated steel insert very resistant to exhaust gases
» Also available as TA-Luft approved in type TSM

SPECIFICATIONS

Graphite with perforated steel insert, AS non-stick surface. Purity: 98%, alt. 99.82%. Density according to customer specification. Dimensions of standard sheet: 1,000 x 1,000 mm. Thickness: 0.6 mm, 0.8 mm, 1 mm, 1.5 mm, 2 mm, 3mm. Tolerances: Thickness ± 5%, length ± 5 mm, width ± 5 mm. Can be supplied as ring seal gaskets in DIN, ANSI, and user-defined dimensions.



KLINGER GRAPHITE LAMINATE MLX

BENEFITS / PROPERTIES

» Multi-layer structure
» Integrated non-stick properties
» High temperature resistance
» Handles high compressive stresses
» Suitable for high internal pressures
» Excellent blow-out resistance

SPECIFICATIONS

Expanded graphite with 0.05 mm thick smooth stainless steel foils.
Dimensions of standard sheet: 1,500 x 1,500 mm.
Thickness: 1.0 mm, 2.0 mm, 3.0 mm. Tolerances: Thickness: ±5%, length: ±5 mm, width: ±5 mm



KLINGER MILAM PSS

BENEFITS / PROPERTIES

» High-temperature materials up to 900 °C in continuous operation
» Suitable for applications such as exhaust pipes, turbines, turbochargers and fuel lines
» Unparalleled resistance to dry heat
» NOTE! Not a high-pressure gasket, max. 5 bar

SPECIFICATIONS

Mica with stainless steel insert, AS self-releasing surfaces. Dimensions of standard sheet: 1,200 x 1,000 mm. Thickness: 1.0 mm, 2.0 mm, 3.0 mm. Tolerances: 1.0 mm thickness ±5%, 2.0 mm thickness ±10%, 3.0mm thickness ±10%, length: ±5%, width: ±5%. Can also be supplied as ring seal gaskets in DIN, ANSI, and user-defined dimensions.



KLINGER SPIRAL WOUND GASKET

BENEFITS / PROPERTIES

» Highly suitable for and common in refinery applications
» Handles 550 °C in continuous operation
» Suitable for applications with pressures up to 160 bar
» Handles large pressure fluctuations
» Multiple filling materials and metals to choose from, standard material is graphite

SPECIFICATIONS

Spiral wound gasket with filling materials graphite (550 °C), PTFE (260 °C), Nonas (350 °C), mica (1,000 °C) or mica & graphite (900 °C). The standard design features the inner ring and winding in 316L stainless steel/graphite and the outer ring in carbon steel. Dimensions: Can be supplied as ring seal gaskets in DIN, ANSI, and user-defined dimensions.



KLINGER KAMMPROFILE GASKET

BENEFITS / PROPERTIES

» Utilizes a serrated metal core with soft facing material
» High-pressure gasket with wide seating stress range
» Excellent tightness even at low bolt loads
» Suitable for a wide range of operating conditions
» Provides a high-integrity seal including for thermo-cycling and shock loading conditions
» Easy to handle and install
» Metallic core can be refurbished with a new facing layer and reused

SPECIFICATIONS

Kammprofile gasket with facing materials graphite (550 °C), PTFE (260 °C), Mica (1,000 °C) and KLINGERSIL C-4430 (250 °C). Kammprofile gasket can also be manufactured from a range of core materials according to media compatibility and temperature considerations. Can be supplied as ring seal gaskets in DIN, ANSI, and user-defined dimensions.



KLINGER KGS GII

BENEFITS / PROPERTIES

» Suitable for temperatures up to 200 °C (valid for FKM)
» Excellent for applications with flanges that have low surface pressure, poor and non-parallel flange surfaces
» Suitable for water, gases, waste water, chemicals, etc.
» Common application areas are, e.g. sewage treatment plants, waterworks, biogas plants and chemicals industry
» Stable gaskets facilitate installation in vertical flanges or systems operating under negative pressure.
» Highly suitable for plastic and fiberglass flanges
» Available in designs with approval for gas (DIN-DVGW) and for drinking water (KTW)

SPECIFICATIONS

Elastomer with steel core. Available elastomers: NR, NBR, EPDM, CSM, FKM. Available in DIN dimensions DN15 to DN2000 and pressure classes PN6 to PN40.



KLINGER SEALEX

BENEFITS / PROPERTIES

- Newly developed installation tape facilitates assembly and adjustment
- Improved dimensional stability reduces the need for retightening
- Suitable for aggressive media up to 260 °C at limited bolt loads
- Adapts perfectly to worn and non-parallel flange surfaces
- FDA certificate of conformity for food & pharma applications
- Excellent for non-metallic and glass flanges
- Suitable for large flange diameters

SPECIFICATIONS

Sealing tape of expanded PTFE.
Width and thickness, standard rolls: 3 x 1.5 mm – 30 m, 5x 2 mm – 20 m, 7 x 2.5 mm – 15 m, 10 x 3 mm – 8 m, 10 x 3 mm – 25 m, 14 x 5 mm – 5 m, 14 x 5mm – 25 m, 17 x 6 mm – 5 m, 20 x 7 mm – 5 m, 25 x 8 mm – 5 m



KLINGERSIL C-4430

BENEFITS / PROPERTIES

- Universal gasket for general use up to 250 °C
- Very good pressure stability
- Highly suitable for steam and hot water
- Does not stick to the flange

SPECIFICATIONS

Synthetic material and fiberglass bonded with NBR, 3xA self-releasing surfaces.
Dimensions of standard sheet: 1,500 x 2,000 mm
Thickness: 0.5 mm, 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm
Tolerances: Thickness ± 10%, length ± 50 mm, width ± 50 mm. Can also be supplied as ring seal gaskets in DIN, ANSI, and user-defined dimensions.



KLINGERSIL C-4400

BENEFITS / PROPERTIES

- Universal gasket for general use up to 150 °C
- Excellent price/performance ratio
- Very good resistance to refrigerants
- Does not stick to the flange

SPECIFICATIONS

Aramid fibers bonded with NBR.
Dimensions of standard sheet: 1,500 x 2,000 mm
Thickness: 0.5 mm, 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm.
Tolerances: Thickness ± 10%, length ± 50 mm, width ± 50 mm. Can also be supplied as ring seal gaskets in DIN, ANSI, and user-defined dimensions.

KLINGER is the world's leading manufacturer and provider of industrial gaskets and valves.



KLINGER VSP PITA®

BENEFITS / PROPERTIES

- Excellent chemical resistance in strong alkaline applications
- FDA-approved for food & pharma industry
- Retained tension = retorquing not required
- No aging
- Very good mechanical properties at medium temperatures
- Standardized PTFE flat gasket with fully encapsulated corrugated TopChem 2000 insert.
- Universal use for easy storage and availability
- Quick installation and removal because gaskets do not stick to flange surfaces.
- PTFE and SiC resistance to media
- High-tightness gasket at low surface pressures
- From 15 MPa, helium leakage rate 1.00E-2 mg/s*m (EN13555)
- No contamination of medium by gasket
- Live-loaded spring insert delivers high gasket recovery, unmatched thermal cycling performance and exceptional operating tightness.

SPECIFICATIONS

- Increased contact pressures through stress concentration on insert.
- Ideal for flanges/applications with low bolt loads



KLINGER WAVELINE WLP

BENEFITS / PROPERTIES

- Multilayer flat gasket, pre-compressed, corrugated cross-section geometry
- Universal use for easy storage and availability
- Installation safety, good handling and easy removal
- Minimal leakage (see materials testing laboratory graph)
- Meets leakage requirements under VDI Directive 2440 and "TA-Luft"
- From 10 N/mm2, leakage rate 0.0001 mg/s m (DIN 28090-1)
- Media resistance of 1.4571 and/or PTFE
- No measurable creeping
- High blow-off safety
- Fast replacement because gaskets do not stick to flange surfaces
- No contamination of medium by gasket

SPECIFICATIONS

- Reduces cross-section leakage through pre-compression of gasket
- Reduces surface leakage through "O-ring effect"
- Reduces surface leakage of a flanged gasket particularly substantially
- Pit provides improved ease of installation due to increased rigidity compared to a smooth metal flange

COMPRESSION PACKINGS



KLINGER TOP-LINE K1140 GFO®

BENEFITS / PROPERTIES

» Max. operating temperature: 285 °C
» Max. peripheral speed: 20 m/s
» pH 0–14
» Braided structure: Interlock
» Good resilience
» Good thermal conductivity
» Low friction
» Pump packing
» Extremely good chemical resistance
» Excellent universal mill compression packing

SPECIFICATIONS

Graphited GFO® fiber with silicon and PTFE lubricants.

Dimensions of standard package: 8 m/box
Sizes, square profile (mm): 3.2, 5, 6.5, 8, 9.5, 11, 12.5, 14, 16, 19, 20, 22, 25. **Tolerances:** ± 0.4 for 3.2, 5.0, and 6.5. All others ± 0.8.



KLINGER TOP-LINE K290 SERIES

BENEFITS / PROPERTIES

» Max. operating temperature: 260 °C
» Max. peripheral speed: 15 m/s
» pH 2–10
» Braided structure: Interlock
» Slurry packing designed to handle high abrasion/high surface velocity
» No damaging of shafts or sleeves under normal conditions
» Retains its mechanical integrity at high speeds
» Suitable for mild chemicals or steam
» Does not hydrolyze

SPECIFICATIONS

K290 – Firm density, K292 – Medium density, K295 – Soft density standard packing.
Size by request, Inconel wired by request.



KLINGER TOP-LINE K3400

BENEFITS / PROPERTIES

» Max. operating temperature: 316 °C
» Max. peripheral speed: 20 m/s
» pH 1–14a
» Braided structure: Interlock
» Good resilience
» Good thermal conductivity
» Good chemical resistance to concentrated alkalis in the kraft pulping process
» Low friction
» Used as end connections in high-temperature and pressure valves
» Pure filament carbon fiber impregnated with graphite and other lubricants

SPECIFICATIONS

Dimensions of standard package: 8 m/box.
Sizes, square profile (mm): 3.2, 5, 6.5, 8, 9.5, 11, 12.5, 14, 16, 19, 20, 22, 25
Tolerances: ± 0.4 for 3.2, 5.0, 6.5. All others ± 0.8.



KLINGER TOP-LINE K54

BENEFITS / PROPERTIES

» Max. operating temperature: 260 °C (K54S up to 280 °C)
» Max. static pressure: 200 bar
» Max. peripheral speed: 10 m/s (5 m/s for K54S)
» pH 0–14
» Suitable for aggressive media
» K54H – designed for pumps
» K54S – universal packing
» Pure PTFE packing

SPECIFICATIONS

Dimensions of standard package: 8 m/roll
Sizes, square profile (mm): 3.2, 5, 6.5, 8, 9.5, 11, 12.5, 14, 16, 17.5, 19, 20.5, 22, 25. Tolerances: ± 0.4 on 3.2, 5.0, 6.5. All others ± 0.8.



KLINGER TOP-LINE K3222W

BENEFITS / PROPERTIES

» Min. operating temperature: -240 °C
» Max. operating temperature: 430 °C, 650 °C (steam)
» Max. static pressure: 280 bar
» Max. peripheral speed: 20 m/s
» pH 0–14
» Excellent for superheated and saturated steam
» Excellent for servicing valves under harsh conditions
» Can also be used in low temperatures
» Permanent resilience
» Extremely dense, properly compressed
» Universal gasket for valves
» Pure exfoliated, expanded graphite gasket with Inconel wire

SPECIFICATIONS

Dimensions of standard package: 8 m/roll
Sizes, square profile (mm): 3.2, 5, 6.5, 8, 9.5, 11, 12.5, 14, 16, 17.5, 19, 20.5, 22, 25. Tolerances: ± 0.4 for 3.2, 5.0, 6.5. All others ± 0.8.



KLINGER TOP-LINE K3222

BENEFITS / PROPERTIES

» Min. operating temperature: -200 °C
» Max. operating temperature: 430 °C, suitable for high temperatures, depending on oxygen
» Max. static pressure: 175 bar
» Max. peripheral speed: 20 m/s
» pH 0–14
» Packing for valve and pump servicing
» Can also be used in low temperatures
» Permanent resilience
» Extremely dense, properly compressed
» Universal gasket for valves
» Pure exfoliated, expanded graphite packing

SPECIFICATIONS

Standard package: 8 m/roll
Sizes, square profile (mm): 3.2, 5, 6.5, 8, 9.5, 11, 12.5, 14, 16, 17.5, 19, 20.5, 22, 25. Tolerances: ± 0.4 on 3.2, 5.0, 6.5. All others ± 0.8.



EXPANSION JOINTS

PRESSURE-BALANCED TYPE

BENEFITS / PROPERTIES

Pressure-balanced types are highly complex and designed to absorb all reaction forces from the bellows and prevent them from being transmitted to the piping systems.
With correct material selection and design, they are great in vital / sensitive systems where minimum pressure thrust is permitted and must be absorbed and controlled.

SPECIFICATIONS

- Size: custom
- Design pressure up to 16 barG
- Design temperature: up to 500 °C
- Bellows material: stainless steel (SS) / nickel alloys and more
- Flange material: carbon steel (CS) / stainless steel (SS) / custom





KB TYPE

BENEFITS / PROPERTIES

Expansion joints with welded ends are equipped with carbon steel or stainless steel pipe connections. Even though they are able to absorb movements in any direction, this type is mainly used for axial movements. If lateral movement is called for, a universal type may be more suitable. This type of expansion joint can be equipped with internal limit liners, covers, limit rods, hinges or gimbals.

SPECIFICATIONS

- Size: DN25–1000
- Design pressure: up to16 barG
- Design temperature: up to 400 °C
- Bellows material: AISI 304, 316, 321 or nickel alloys



SF TYPE (FIXED FLANGE)

BENEFITS / PROPERTIES

Expansion joints with fixed flanges are equipped with welded carbon steel or stainless steel flanges (EN, ASME or as specified). This type absorbs mainly axial movements but allows some lateral movement. If lateral movement is called for, a universal type may be more suitable. This type of expansion joint can be equipped with limit rods, internal limit liners, covers, hinges or gimbals.

SPECIFICATIONS

- Size: DN25–1000
- Design pressure: up to 16 barG
- Design temperature: up to 400 °C
- Bellows material: AISI 304, 316, 321 or nickel alloys
- Flange material: CS / SS / Custom



DF TYPE (FLOATING FLANGE)

BENEFITS / PROPERTIES

Expansion joints with floating flanges are equipped with carbon steel or stainless steel flanges (EN, ASME or as specified). This type absorbs mainly axial movements but allows some lateral movements. Even though they are able to absorb movements in any direction, this type is mainly used for axial movements. If lateral movement is called for, a universal type may be more suitable. Available for exhaust gas, liquid media and steam. Bellows are sized based on the latest EJMA standards. Expansion joints with floating flanges may also have a double bellows designed for absorbing the greater lateral movements.

SPECIFICATIONS

- Size: DN25–1000
- Design pressure: up to 16 barG
- Design temperature: up to 400 °C
- Bellows material: AISI 304, 316, 321 or nickel alloys
- Flange material: CS / SS / Custom



HINGED & GIMBAL TYPES

BENEFITS / PROPERTIES

Hinged and gimbal-type expansion joints are designed to absorb angular movements in either one plane (hinged) or several planes (gimbals), while constraining the pressure forces from the bellows. They are great in the production and furnace systems, where extreme conditions occur, i.e., high temperatures, aggressive and corrosive media.

SPECIFICATIONS

- Size: custom
- Design pressure up to 16 barG
- Design temperature: up to 500 °C
- Bellows material: Stainless steel (SS) / nickel alloys
- Flange material: CS / SS / Custom



RUBBER EXPANSION JOINTS (REJ)

BENEFITS / PROPERTIES

Rubber expansion joints provide great protection for pipelines for hot-dip galvanization (HDG) plants where oxidation of acid gas / hydrochloric acid takes place.

SPECIFICATIONS

- Size: DN25–800
- Design pressure up to 16 barG
- Design temperature: up to 110 °C
- Bellows material: EPDM / NBR / CR / SBR
- Flange material: CS / SS



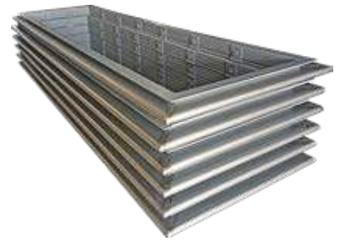
VIBRATION ABSORBERS

BENEFITS / PROPERTIES

Metal expansion joints can also be used to absorb vibrations in systems. They are manufactured from thin, multi-layer bellows for excellent vibration absorbing capabilities.Multi-layer bellows help to dampen high-frequency and low-amplitude vibrations. Vibration absorbers are mainly used with flange connections, but can also be equipped with welded connections. A very typical accessory for this type of expansion joint is a limit rod / tierod to constrain pressure thrust of the bellows or limit excessive deflections. Metal expansion joints are an excellent choice for absorbing vibrations where temperatures or pressures are too high for rubber expansion joints. Rubber washers can be used to reduce noise.

SPECIFICATIONS

- Size: DN50–500
- Design pressure: up to 16 barG
- Design temperature: up to 400 °C
- Bellows material: AISI 304, 316L, 321
- Flanged material: CS / SS



RECTANGULAR METAL EXPANSION JOINTS (MEJ)

BENEFITS / PROPERTIES

Rectangular metal expansion joints are designed to absorb movements in all three directions i.e. axial, lateral and angular. The rectangular bellows are mainly designed for applications with very low pressure, such as ducts, exhaust systems, ventilation systems etc. Rectangular metal expansion joints are designed and used in gas turbines exhaust systems, turbine and condenser connections and so on, for example in shipbuilding. The bellows can be designed and manufactured as U- and V-shapes and can be connected via various corner types (single / double / camera V-shape corners or round U-shape corners) in accordance with the specified operating conditions.

SPECIFICATIONS

- Size: custom
- Design pressure: up to 1 barG
- Design temperature: up to 850 °C
- Minimum reaction forces
- Bellows material: CS, AISI 304, 316L, 321
- Hardware material: CS, AISI 304, 316L, 321



INSTRUMENTATION

KLINGER REFLEX GAUGE

BENEFITS / PROPERTIES

In reflex gauges, the fluid is viewed through a reflex glass, a crystal with a smooth surface on the outside and prism grooves on the inside. The resulting refraction allows to see the internal level of fluid. Reflex level gauges offer many advantages such as low purchase and maintenance costs and easy level reading. However, they cannot be used in certain cases, for example when the separation level between two liquids must be read, when the observation of the liquid's color is required or when the fluid is a high-pressure water steam.

SPECIFICATIONS

» Media: water, liquids, liquefied gases and steam
» Good light / dark contrast gives a clear reading
» Can be delivered with both left- and right-handed control
» Display can be rotated 360 degrees
» Pressure class shows up to 250 bar
» Design temperature up to 400 °C









KLINGER TRANSPARENT LEVEL GAUGE

BENEFITS / PROPERTIES

Suitable for water, fluids and steam. Supplied with original KLINGER borosilicate glass "extra tempered".

SPECIFICATION

» Resistant to high temperatures
» Display can be rotated 360 degrees
» Pressure class shows up to 180 bar
» Design temperature up to 400 °C

KLINGER MAGNETIC LEVEL GAUGE

BENEFITS / PROPERTIES

Particularly suitable for working with hazardous and toxic liquids and gases. These gauges deliver immediate, precise responses to level changes, ensuring clear, accurate readability. With continuous control, users can maintain an ongoing assessment of the fluid level. Offer both local and remote display options, as well as alarm switching capabilities for enhanced safety. Design requires minimal maintenance.

SPECIFICATIONS

» High-pressure capability, up to 312 bar
» 360-degree rotating display

PRESSURE GAUGE

BENEFITS / PROPERTIES

Pressure gauges for monitoring all types of pressures in industrial applications. Delivered from stock with glycerine filling.

SPECIFICATIONS

» Dimensions: Ø63 mm, Ø100 mm or Ø160 mm, 1.4301 (AISI 304)
» Wetted parts: brass or stainless steel (AISI 316)
» Ranges: -1 bar – 1,600 bar according to EN 837-1
» Connection: bottom- or rear-threaded



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