KLINGER
trusted. worldwide.

SOLUTIONS

for Mining and Mineral Processing

www.klinger-international.com

KLINGER GROUP

Visionary by Tradition

KLINGER®
trusted. worldwide.

KLINGER is the world's leading manufacturer and provider of industrial fluid sealing and fluid control products.

Founded in 1886 as a family enterprise, the pioneer in gasket technology today has evolved into a globally operating corporate group comprising independent global manufacturing, sales and service companies that offer unique know-how and expert on-site consulting services in 60 countries around the world.

Our customers include leading companies from a wide range of industries from manufacturing, infrastructure and automotive to marine, oil & gas, chemicals, pulp & paper, as well as energy, food & beverage, and pharmaceuticals. KLINGER employs some 2,600 people worldwide with total annual sales of around 635 million euros.

635 MIO. ANNUAL SALES

635 million euros in revenue generated by the KLINGER Group per year.

2,600 EMPLOYEES

Our global workforce is 2,600 people strong.

80 COUNTRIES

KLINGER Group has already exported to 80 countries and counting.

18 PRODUCTION SITES

The KLINGER Group manufactures gaskets, valves, instrumentation, expansion joints and hoses in almost 20 countries.

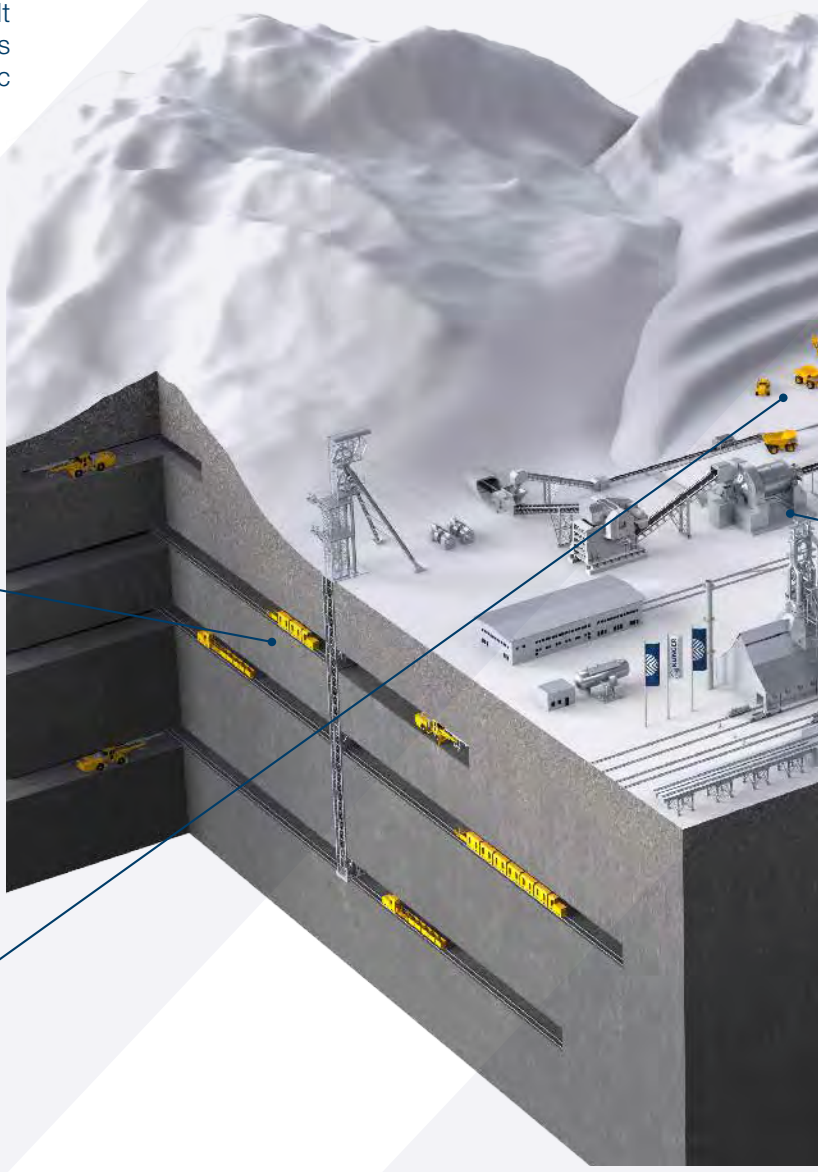
60 COUNTRIES

The KLINGER Group subsidiaries and representatives are located globally.

PLANT VIEW

Mining process stages

Mine design is a crucial aspect of the mining process, encompassing the planning and development of a mine to extract and process mineral deposits efficiently and safely. It involves a comprehensive approach that considers various factors, including geological data, mining methods, economic feasibility, and environmental sustainability.



ORE EXTRACTION

Removing the rock containing minerals (ore) from the ground.

SHAFT/UNDERGROUND MINING

A method of extracting minerals from an ore deposit that is located deep underground. This method involves digging into the earth to create a network of shafts and tunnels that allows miners to access the ore. Underground mining is typically used for deep deposits of minerals that are not economically feasible to extract using surface mining methods.

SURFACE/OPEN-PIT/ OPEN-CAST MINING

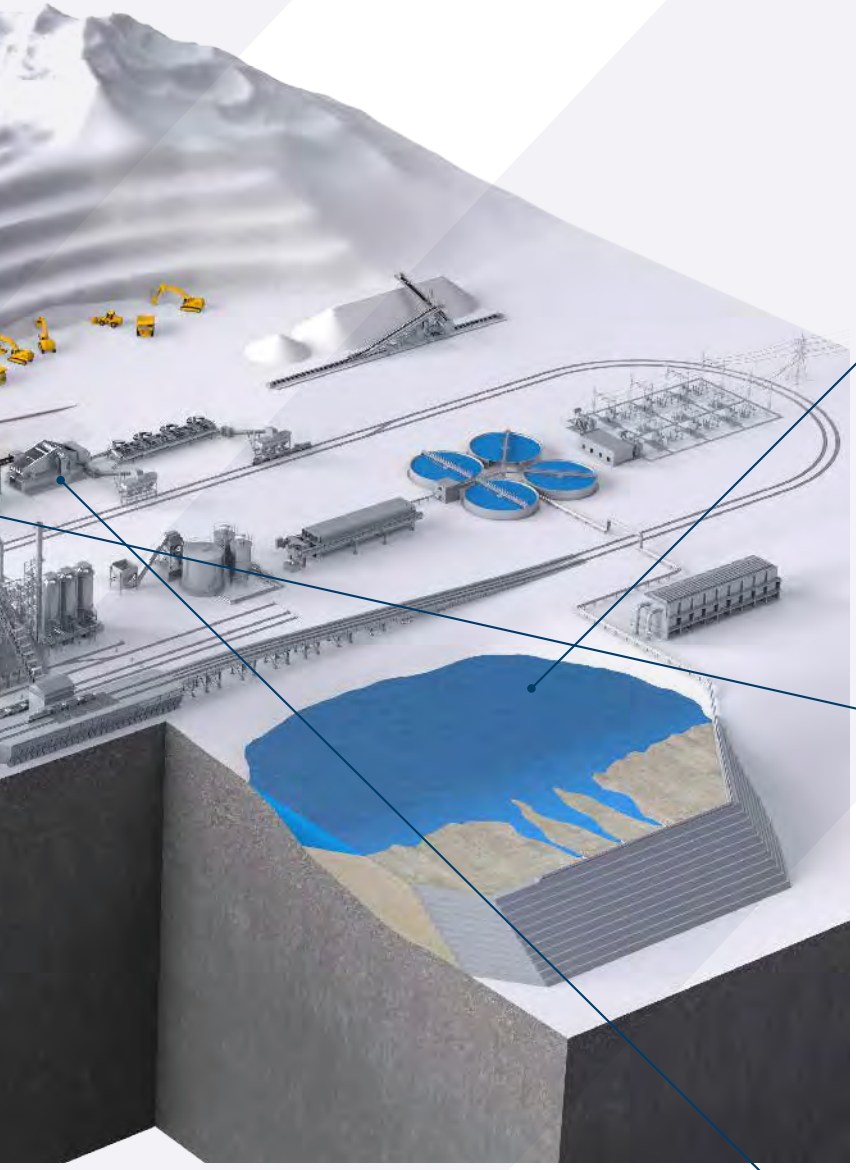
A method of extracting minerals from an ore deposit that is located near the surface of the earth. This method involves removing the overburden, which is the layer of rock and soil that lies above the ore deposit. Once the overburden is removed, the ore can be excavated using large machinery, such as excavators and trucks. Surface mining is typically used for shallow deposits of minerals that are not economically feasible to extract using underground mining methods.

ALLUVIAL/PLACER MINING

A method of extracting minerals from loose sediments, such as sand and gravel, that have been deposited by rivers and streams. This method involves using water to wash away the lighter sediments and concentrate the heavier minerals, such as gold. Alluvial mining is a relatively simple and inexpensive method of extracting minerals, but it is only effective for recovering minerals that are dense and have a high specific gravity.

IN-SITU RECOVERY/ SOLUTION MINING

A method of extracting minerals by dissolving them in a solution. This method is typically used for minerals that are soluble in water, such as copper and uranium. In-situ recovery involves drilling wells into the ore deposit and injecting a solution that dissolves the minerals. The solution is then pumped to the surface, where the minerals are recovered from the solution. In-situ mining is a relatively environmentally friendly method of extracting minerals, as it does not require the removal of large amounts of overburden or waste rock.



DEWATERING MANAGEMENT

The operation and maintenance of systems that remove groundwater or surface water.

COMMINUTION

Crushing and grinding the mined ore into fine particles to liberate the valuable minerals. The reduced particle size assists in removing the minerals or materials from the ore, allowing easier separation from waste materials.

CRUSHING

Crushing is the process of breaking down the raw ore into smaller pieces to increase its surface area, which facilitates the separation of valuable minerals from the waste rock. Crushing equipment ranges from jaw crushers to impact crushers, depending on the size and hardness of the ore.

GRINDING

Grinding is the process of further pulverizing the crushed ore into a fine powder. Finer particles have a larger surface area, making it easier to separate the valuable minerals from the waste rock using various concentration techniques. Grinding equipment includes ball mills and rod mills.

SCREENING

Screening is the process of separating ore particles of different sizes. It involves passing the crushed ore through a series of screens with progressively smaller openings. This allows the valuable minerals to be separated from the waste rock based on their sizes.

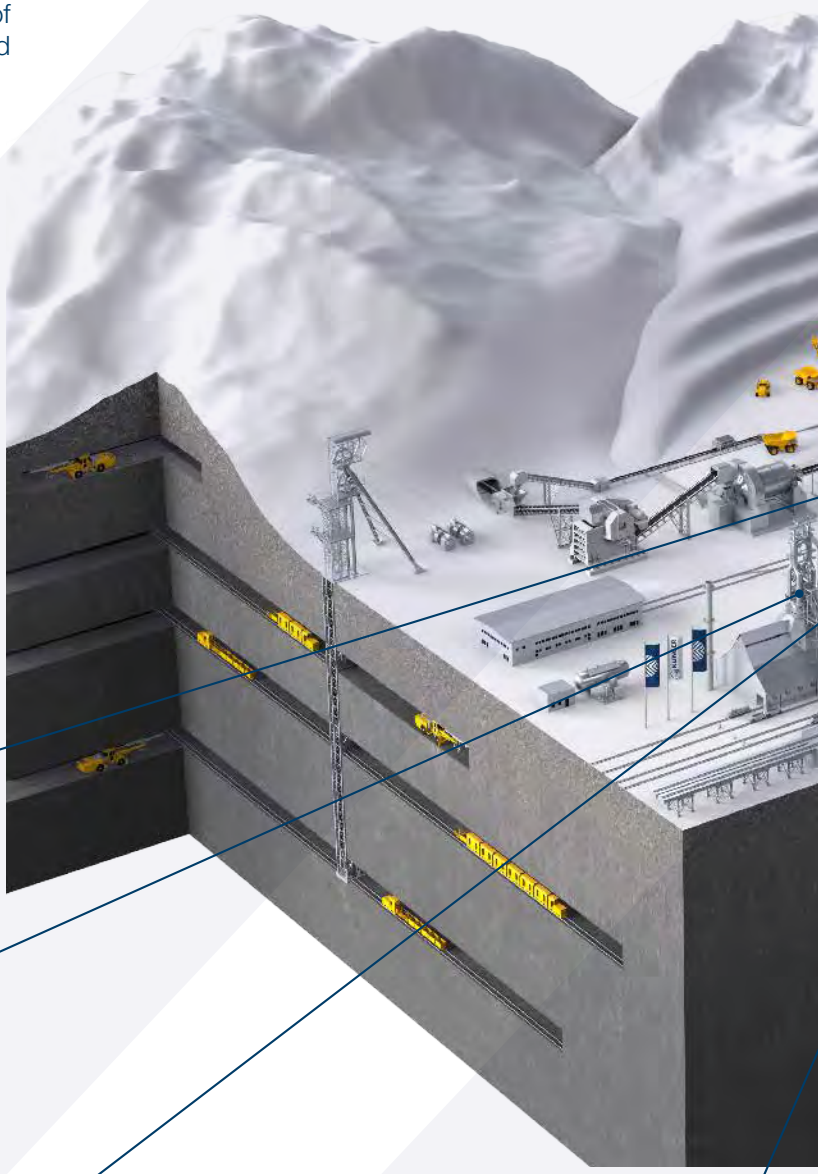
WASHING

Washing is the process of removing fine particles, known as slimes, from the crushed ore. This is often necessary to prevent slimes from interfering with subsequent processing steps. Washing is typically done using water jets or hydrocyclones.

PLANT VIEW

Mining process stages

Mineral processing increases the concentration of mineral- or metal-bearing ore by separating it from waste materials, thereby reducing the cost and increasing the speed of recovery and purification. The desired metals are extracted from the concentrates.



CONCENTRATION

Concentration is a crucial stage in the mining process where valuable minerals are separated from waste rock (gangue) to form a concentrated product with significantly higher mineral content. This enhances the efficiency and economic viability of further processing steps like refining and purification.

GRAVITY SEPARATION

This method uses the difference in density between the valuable minerals and the gangue to separate them.

FROTH FLOTATION SEPARATION

This method uses the difference in the surface properties of the valuable minerals and the gangue to separate them.

SMELTING

Smelting is a high-temperature process that involves melting and fusing a mineral to extract the desired metal. It typically involves heating the mineral in a furnace or reactor at high temperatures. The molten metal is then separated from the slag, which is the non-metallic waste material.

LEACHING

This technique uses a chemical solution to dissolve the valuable minerals from the ore. The ore is placed in a tank with the chemical solution, and the valuable minerals are dissolved into the solution. The solution is then separated from the ore, and the valuable minerals are recovered from the solution.

MAGNETIC SEPARATION

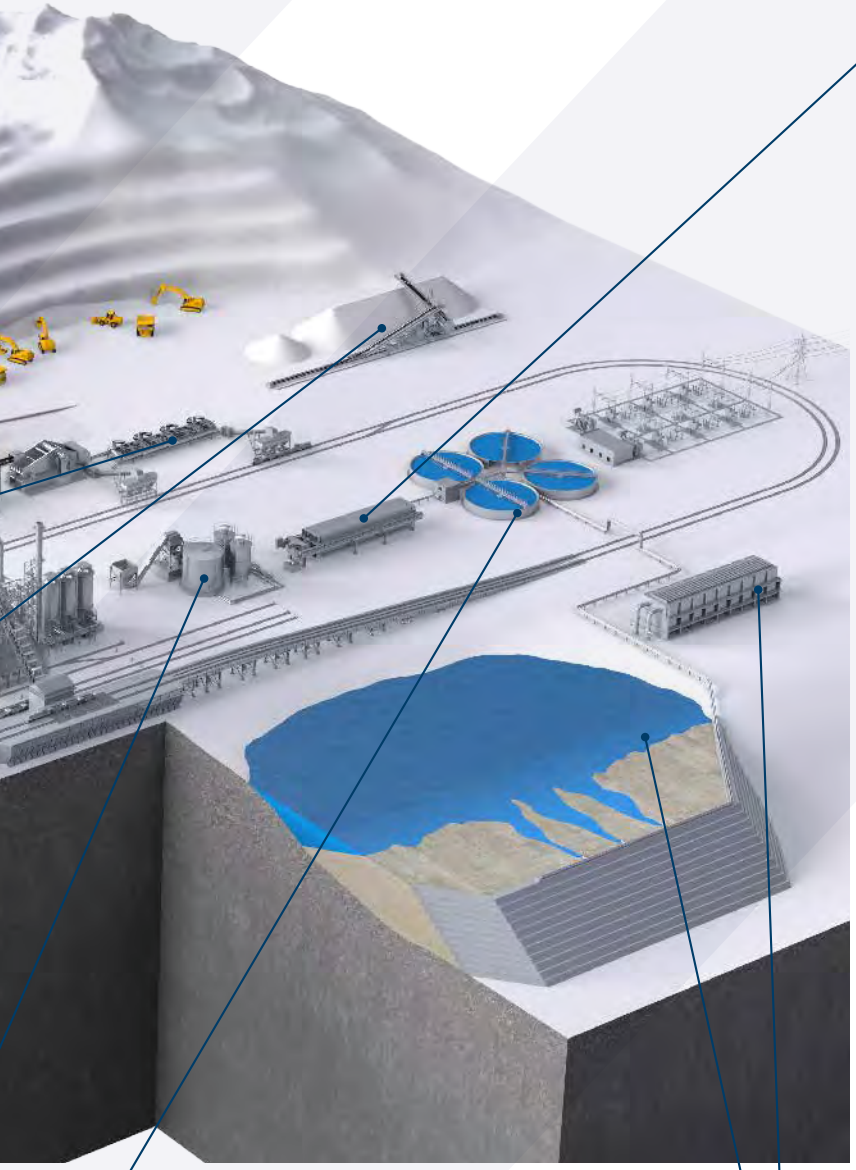
This technique uses the magnetic properties of the valuable minerals to separate them from the gangue.

DIGESTION

Digestion is a leaching process that involves dissolving a mineral in a chemical solution to extract the desired metal. It typically involves mixing the mineral with a solvent and heating the mixture to a specific temperature. The dissolved metal is then separated from the solution using methods such as precipitation or solvent extraction.

THICKENING

A process in mining that utilizes sedimentation to separate solids from liquids. A slurry of ore and water is fed into a thickener, where the solids settle to form a thickened slurry at the bottom of the tank. The clear liquid, or overflow, is then separated from the thickened slurry and recycled back into the process.



FILTRATION

A process in mining that further dewaters the thickened slurry from the thickening stage to produce a cake or filter cake. The thickened slurry is fed into a filter press or vacuum filter, where the solids are retained on the filter medium while the water passes through. The filter cake is then discharged from the filter and the remaining water is recycled back into the process.

REFINING AND PURIFICATION

Refining and purification are the final stages of the mining process where valuable minerals, commonly referred to as concentrates, are further processed to remove any remaining impurities. This involves various methods depending on the specific mineral and desired grade.

LIQUATION

The liquation method is used for metals with a low melting point. The feedstock is heated to a point slightly above the metal's melting point. This metal then flows out of the feedstock, leaving the impurities behind.

DISTILLATION

The distillation method is used for metals with low boiling points, such as mercury and zinc. The impure metal is boiled, leaving the impurities behind. These metal fumes are then condensed, resulting in a metal of very high purity.

VAPOR PHASE

The vapor phase method is used when the impure metal can be converted into a volatile compound (gas) in the presence of a reagent. This volatile compound is broken down to yield high-purity metals.

ZONE REFINING

Zone refining is used to produce high-purity metals. It is based on the principle that when an impure metal in a molten state is allowed to cool, only the metal crystalizes while the impurities remain liquid.

CHROMATOGRAPHIC REFINING

Chromatographic refining is the separation of a mixture of chemicals into its individual components. This mixture is dissolved in either a liquid or gas solvent before processing.

TAILINGS MANAGEMENT

The removal, storage or disposal of leftover/waste materials from the processing of mined ore.

ELECTROLYTIC REFINING

Electrolytic refining is a process of purifying metals using electrolysis. The impure metal is used as an anode and is connected to the positive terminal of a DC current. This metal is then dissolved in a solution and deposited on the cathode, thereby purifying the metal.

VALVES

KNIFE GATE VALVE

Slurry knife gate valve with natural rubber, EPDM or polyurethane sleeves, ductile iron body, 304SS gate, EPDM packing, semi-lugged, wafer body, drilled and tapped to suit PN10 raised-face flanges.

Handwheel-operated from DN50 to DN200, and gearbox-operated from DN250.

Backing plates and splash guards with open-end design. Blanking plates to enable flushing are optionally available.

SPECIFICATIONS

» Suitable for up to 10 bar (dependent on size)
» Maximum temperature: 75 °C
» Size range: DN50 to DN600
» Pressure rating: PN10 and ASME Class 150

High reliability, long life cycle, and low total cost of ownership.

BUTTERFLY VALVE

BENEFITS / PROPERTIES

Stainless steel or cast-iron butterfly valve. Flanged, lugged and wafer-type end connections. EPDM, NBR, PTFE or or metal seats. Pinless disc with lockable hand lever. Can be gearbox-operated.

SPECIFICATIONS

- Suitable for up to 16 bar
- Maximum temperature: 80 °C to 100 °C (dependent on liner)
- Size range: DN50 to DN600
- Conforms to EN 593 specifications
- Pressure rating: EN 1092, PN16, ASME Class 150 and Class 300

GLOBE VALVE

BENEFITS / PROPERTIES

Ideal for use in high-pressure and high-temperature boiler and steam applications. Available in various body materials to suit your application, including ductile iron, WCB, CF8M and F5. End connection designs include flanged, wafer, socket weld and butt weld.

SPECIFICATIONS

- Pressure range: From PN10 to PN40 and ASME Class 150 to Class 800
- Size: DN8 to DN600
- Tested according to EN 12266 / API 598

PRESSURE-REDUCING VALVE

BENEFITS / PROPERTIES

Pressure-reducing valve available in brass, cast iron, ductile iron, and stainless steel. Bolted ends BSP and flanged.

SPECIFICATIONS

- Temperature range: Min. 0 °C to max. 65 °C
- Size range: DN15 to DN400
- Suitable for 10 to 63 bar

CHECK VALVE

BENEFITS / PROPERTIES

A check valve is a unidirectional sensing valve also known as a non-return or one-way valve and prevents reverse flow of media. Check valves are available as swing, piston, double-door, disco, ball and tilted-disco types. The choice of check valve type is dependent on the application. Body material includes ductile iron, forged steel, stainless-steel, and various others.

SPECIFICATIONS

- Available sizes: DN8 to DN600
- Pressure rating: PN10 – PN32 and Class 150 – Class 800
- Temperature rating: Dependent on valve type

FOOT VALVE

BENEFITS / PROPERTIES

Cast iron, ductile iron, stainless-steel and various other body materials with mesh strainer coupled with the appropriate check valve. Bolted BSP and flanged according to EN 1092.

SPECIFICATIONS

- Size range: DN25 to DN300
- Maximum pressure rating: PN16
- Maximum temperature rating: 80 °C

PLUG VALVE

BENEFITS / PROPERTIES

Valve body available in ductile iron, cast iron, CF8M and other materials on request. The plug is available in carbon steel, stainless-steel and other materials depending on application requirements. The plug may also be fully encapsulated with a PTFE liner. These valves boast a zero-body cavity design.

SPECIFICATIONS

- Available sizes: DN8 – DN250
- Pressure rating: PN10 – PN50 and ANSI Class 150 – Class 800
- Temperature rating: Dependent on valve design

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

DIAPHRAGM VALVE

BENEFITS / PROPERTIES

Diaphragm valves consist of three parts. A body with two or more ports, a flexible diaphragm and a seat where the flow may be isolated or throttled.

A saddle (A) seat also called a full port ball or straight-through valve is used for isolation whereas a weir (KB) seat is used for control or throttling. Bodies can be manufactured from cast iron, ductile iron, stainless steel, and others on request. Body linings and diaphragms can be manufactured from EPDM, NBR and PTFE-lined elastomer. Other linings and diaphragms are optionally available. These valves are supplied with flanged end connections.

SPECIFICATIONS

- Available sizes: DN15 – DN350
- Pressure rating: PN6 – PN16 and ANSI Class 125 – Class 150
- Temperature rating dependent on materials used

PINCH VALVE

BENEFITS / PROPERTIES

Pinch valves are an economical solution for slurry applications where the media may be isolated, controlled or throttled by pinching an elastic tube or hose. This tube or hose is either open or enclosed within the valve housing and located between moving cams that are operated either manually or remotely by means of an actuator. Various valve body or hose designs are available to suit the plant’s requirements depending on the application.

SPECIFICATIONS

- Available sizes: DN15 – DN300
- Pressure rating: Up to PN40 dependent on valve type and size
- Temperature rating dependent on materials used

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) / Double block and bleed (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

GASKETS

KLINGER TOPCHEM 2003

KEY FEATURES

» Mechanically stabilized with glass microspheres
» Excellent chemical resistance to acids and alkalis
» Good creep and stress relaxation values
» High compression values
» Ideal for cryogenic service
» Good mechanical strength

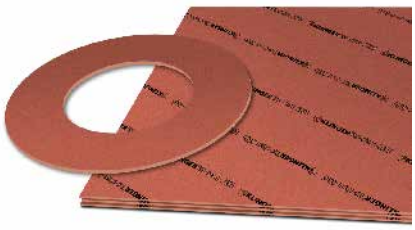
BENEFITS

A fantastic, chemically resistant general-purpose material. Maintains bolt load for extended periods of time when compared to virgin grades. Can withstand moderate assembly stresses. Ideal for use with liquified gases. Forgiving of worn / pitted / damaged / misaligned seal faces.

SPECIFICATIONS

Pressure: Up to 62 bar at 0 °C*
Temperature: Up to 200 °C at atmospheric pressure*

*Maximum pressure and maximum temperature should not be used in conjunction.
PTFE based materials should not be used with alkali metals at elevated temperatures.



KLINGER TOPCHEM 2000

KEY FEATURES

» Mechanically stabilized with silicon carbide
» Excellent chemical resistance to acids and alkalis
» Excellent creep and relaxation values
» Ideal for cryogenic service
» Excellent mechanical strength

BENEFITS

A fantastic, chemically resistant general-purpose sealing material. Maintains bolt load for extended periods of time. Can withstand high assembly stresses. Ideal for use with liquified gases.

SPECIFICATIONS

Pressure: Up to 62 bar*
Temperature: Up to 250 °C*

*Maximum pressures and temperatures should not be used in conjunction.
PTFE based materials should not be used with alkali metals at elevated temperatures.

KLINGER TOPCHEM 2005

KEY FEATURES

» Mechanically stabilized with silica
» Excellent chemical resistance to acids
» Excellent creep and stress relaxation values
» Ideal for cryogenic service
» Good mechanical and dielectric strength

BENEFITS

A fantastic, alkali-resistant sealing material. Maintains bolt load for extended periods of time. Can withstand high assembly stresses. Ideal for use with liquified gases. Ideal gasket for use in flange insulation kits.

SPECIFICATIONS

Pressure: Up to 62 bar at O °C*
Temperature: Up to 250 °C at 40 bar*

*Maximum pressures and temperatures should not be used in conjunction.

KLINGER TOPCHEM 2006

KEY FEATURES

» Mechanically stabilized with barium sulfate
» Excellent chemical resistance to alkalis
» Excellent creep and stress relaxation values
» Ideal for cryogenic service
» Good mechanical strength

BENEFITS

A fantastic alkali resistant sealing material. Maintains bolt load for extended periods of time. Can withstand high assembly stresses. Ideal for use with liquified gases.

SPECIFICATIONS

Pressure: Up to 62 bar at O °C*
Temperature: Up to 250 °C at 40 bar*

*Maximum pressures and temperatures should not be used in conjunction.
PTFE based materials should not be used with alkali metals at elevated temperatures.

KLINGER MAXIFLEX SPIRAL WOUND

KEY FEATURES

- A semi-metallic gasket with excellent creep / stress relaxation and recovery values
- May be manufactured from various materials to suit your application
- A heavy duty and high integrity gasket
- Designed and manufactured as a self-centering gasket

BENEFITS

Suitable for high pressure and high temperature applications. Due to its excellent recovery, it will maintain a tight seal in aggressive cyclic applications. A very versatile gasket as chemical and temperature resistance is dependent on the materials of construction. Due to its low creep values, it will maintain the applied bolt load for an extended period.

SPECIFICATIONS

Standards: ASME B16.20, EN 1514-2, ISO 7005
Pressure: Up to 400 bar*
Temperature: Up to 900 °C*

*The above pressures and temperature are dependent on the overall design and material selection.

MONEL SPIRAL WOUND GASKETS

KEY FEATURES

- A semi-metallic gasket with excellent creep/stress relaxation and recovery values
- Manufactured from Monel / carbon steel and your choice of PTFE or graphite fillers
- A heavy duty and high integrity gasket
- Designed and manufactured as a self-centering gasket

BENEFITS

Suitable for high pressure and high temperature applications. Due to its excellent recovery, it will maintain a tight seal in aggressive cyclic applications. Has superior chemical resistance to HF / hydrofluoric acid. Due to its low creep values, it will maintain the applied bolt load for an extended period.

SPECIFICATIONS

Standards: ASME B16.20, EN 1514-2, ISO 7005
Pressure: Up to 400 bar*
Temperature: PTFE filled: 180 °C * Graphite filled: 400 °C*

*The above pressures and temperatures are dependent on the overall design and material selection.

KLINGERSIL C-4324

KEY FEATURES

- An economy grade material
- Low seating stress
- Ideal for lower performance applications

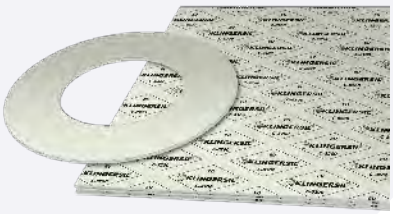
BENEFITS

Reliable service at reduced cost. Seals at low bolt load and is suitable for most flat face flange applications. Easy to cut on site and is available in large sheet sizes.

SPECIFICATIONS

Pressure: Up to 60 bar*
Temperature: 150 °C*

*Maximum pressures and temperatures should not be used in conjunction with each other.



KLINGERSIL C-8200

KEY FEATURES

- An economy acid-resistant grade gasket sheeting
- Manufactured from a glass fibre with a Hyperlon binder

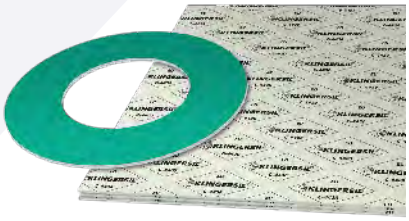
BENEFITS

Chemically resistant to most acids excluding Nitric acid. Easy to cut on site and is available in large sheet sizes. Suitable for use with Sulphuric acid at 96 % concentration.

SPECIFICATIONS

Pressure: Up to 60 bar*
Temperature: 100 °C*

*Maximum pressures and temperatures should not be used in conjunction.



KLINGERSIL C-4430

KEY FEATURES

- Excellent dielectric strength
- Good stress relaxation values
- Excellent fluid swell / percentage thickness increase values
- Good gas permeability/tightness values

BENEFITS

Ideal gasket for use in flange insulation kits. Maintains bolt load for an extended period. An ideal gasket for use in oils and fuels. A good gasket for sealing vacuums and gases.

SPECIFICATIONS

Pressure: Up to 60 bar*
Temperature: 250 °C*

*Maximum pressures and temperatures should not be used in conjunction. Maximum recommended temperature in steam applications is 180 °C.

MILAM PSS

KEY FEATURES

- Ultra-high heat resistance
- Manufactured from aluminosilicate / mica phlogopite
- Good stress relaxation values
- Good compressibility and recovery

BENEFITS

Maintains bolt load for extended periods of time. Forgiving of flange seal face damage. Tolerant of cyclic service. Effectively seals gases at elevated temperatures.

SPECIFICATIONS

Pressure: Up to 5 bar at 900 °C*, up to 17 bar at 600 °C*
Temperature: 900 °C at 5 bar*, 600 °C at 17 bar*

*Maximum pressures and temperatures based on 2.0mm thick material.

EPDM

KEY FEATURES

- Good chemical resistance
- Good heat resistance
- Good resistance to ozone and ultraviolet (UV) radiation
- Tear resistant

BENEFITS

A good general-purpose sealing material. Resistant to aging and can be used outdoors where it is subject to weathering. Ideal for use as trims, skirting, and for flat-faced flanges. Easy to cut on site.

SPECIFICATIONS

Pressure: Up to 10 bar*
Temperature: Up to 120 °C when cured with Sulfur*
Up to 150 °C when cured with Hydrogen Peroxide*

*Maximum pressures and temperatures should not be used in conjunction.

ENVELOPE GASKETS

KEY FEATURES

- Excellent resistance to acids and alkalis
- Excellent creep and stress relaxation values (dependent on filler selection)
- An inexpensive chemically resistant gasket
- Excellent mechanical strength

BENEFITS

A fantastic, chemically resistant general-purpose gasket. Maintains bolt load for extended periods of time. Can withstand high assembly stresses. Can be manufactured in a variety of thicknesses to suit your application.

SPECIFICATIONS

Pressure: Up to 40 bar*
Temperature: Up to 180 °C*

*The above pressures and temperature are dependent on the overall design and material selection.

RUBBER INSERTION

KEY FEATURES

- An inexpensive gasket mostly used in water applications
- Good compressability
- Tear resistant

BENEFITS

A good general-purpose sealing material for water applications. Seals at low bolt load. Ideal for use on flat-faced flanges. Easy to cut on site.

SPECIFICATIONS

Pressure: Up to 10 bar*
Temperature: Up to 80 °C*

*Maximum pressures and temperatures should not be used in conjunction.

RUBBER-STEEL GASKET

KEY FEATURES

- Good chemical resistance
- Good heat resistance
- Excellent pressure resistance
- Excellent compressive strength due to the steel center ring

BENEFITS

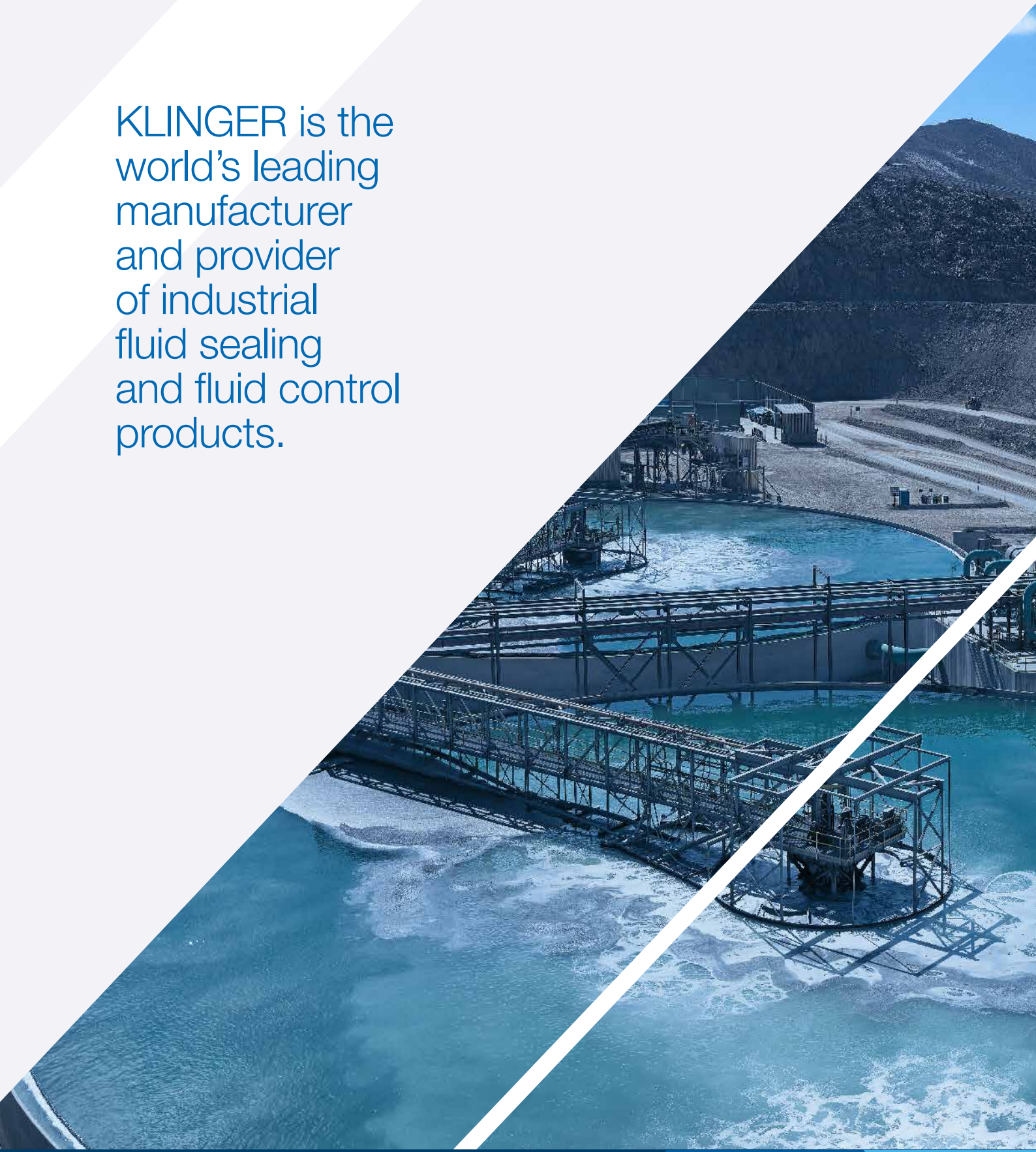
A good general-purpose high-pressure gasket. Can withstand high applied bolt loads. Seals at low bolt loads. Creates an effective seal on soft seal faces. Ideal for use in high-pressure HDPE piping.

SPECIFICATIONS

Pressure: Up to 40 bar*
Temperature: Up to 85 °C*

*Maximum pressures and temperatures should not be used in conjunction.

KLINGER is the world's leading manufacturer and provider of industrial fluid sealing and fluid control products.



GLAND PACKING

K7302DL

Manufactured from various high-strength modified aramid yarns result in a packing with high lubrication retention ability resulting in low shaft or sleeve wear. Ideal for use in high-pressure and high-speed pumping applications. KLINGER Style K7302DL is the market-leading slurry packing. Also available with a PTFE lubricant. Exclusive to KLINGER.

SPECIFICATIONS

» Temperature: 260 °C*
» pH Range: 2 – 12*
» Pressure: 36 bar*
» Surface speed: 16 m/s*
» Services: Rotary, reciprocating and valves

*Maximum values – temperature, pressure, pH and speed should not be combined in any one application without careful consideration. Common sense balancing of limiting factors is always advised.

K25

BENEFITS / PROPERTIES

KLINGER K25 is an aramid fibre packing impregnated with a PTFE dispersion. It is recommended for use in media containing suspended solid abrasive particles. For use in pumps, mixers, valves, and knife gates. Ideal for heavy-duty slurry applications in the pulp & paper, agriculture, and mining industries.

SPECIFICATIONS

» Temperature: 260 °C*
» pH range: 2 – 12*
» Pressure: 30 bar*
» Surface speed: 15 m/s*
» Services: Rotary, reciprocating, static and valves

*Maximum values – temperature, pressure, pH and speed should not be combined in any one application without careful consideration. Common sense balancing of limiting factors is always advised.

K4313

BENEFITS / PROPERTIES

KLINGER K4313 is a unique cross-braided packing that is made from a combination of PTFE with a graphite inclusion and aramid corners. The strong aramid corner posts resist extrusion from the stuffing box while ensuring that unwanted solids are kept out.

SPECIFICATIONS

» Temperature: 260 °C*
» pH range: 2 – 12*
» Pressure: 40 bar*
» Surface speed: 20 m/s*
» Services: Rotary, reciprocating and static

*Maximum values – temperature, pressure, pH and speed should not be combined in any one application without careful consideration. Common sense balancing of limiting factors is always advised.

K20

BENEFITS / PROPERTIES

KLINGER Style K20 has the ability to handle a wide range of chemicals as well as light-duty slurry applications. Style K20 is manufactured from glass and acrylic yarns and lubricated with our proprietary Doulon® lubricant, providing excellent heat transfer and lubricating properties for an extended service life and low shaft wear.

SPECIFICATIONS

» Temperature: 175 °C*
» pH range: 4 – 10*
» Pressure: 15 bar*
» Surface speed: 12 m/s*
» Services: Rotary, reciprocating, static and valves

*Maximum values – temperature, pressure, pH and speed should not be combined in any one application without careful consideration. Common sense balancing of limiting factors is always advised.

K54H/F

BENEFITS / PROPERTIES

KLINGER K54H is an excellent PTFE packing for plant-wide use especially when a clean, non-contaminating packing is required with a very high degree of chemical resistance. Can be used in virtually all media including strong acids and alkalis. K54F is suitable for use in valves in oxygen service up to 20 bar pressure.

SPECIFICATIONS

- Temperature: 260 °C*
- pH range: 0 – 14*
- Pressure: 20 bar*
- Surface speed: 20 m/s*
- Services: Rotary, reciprocating, static and valves

*Maximum values – temperature, pressure, pH and speed should not be combined in any one application without careful consideration. Common sense balancing of limiting factors is always advised.

K7301

BENEFITS / PROPERTIES

KLINGER K7301 is a dry general-purpose seal used to seal doors and covers on boilers, ovens and furnaces, and as rotary kiln seals, brickwork bumper seals and electrode seals in arc furnaces. Available in round, square or rectangular cross-sections, from 3 mm up to 200 mm.

SPECIFICATIONS

- Temperature: 700 °C*
- pH range: 3 – 9*
- Pressure: 5 bar*
- Services: Static sealing only

*Maximum values – temperature, pressure, pH and speed should not be combined in any one application without careful consideration. Common sense balancing of limiting factors is always advised.

Control of fluid loss is essential to the succesful operation of mechanical equipment used in fluid handling.

LONG BARREL COUPLING

BENEFITS

Unifit long barrel couplings are specifically designed for connecting GRP and HDPE pipe. Barrel lengths are specified to cater to HDPE thermal expansion & contraction upon installation.

SPECIFICATIONS

» Pressure: Up to PN64
» Available sizes: DN40 to DN3000
Suitable for most common pipe materials

KLINGER
pipe products
– connecting
innovation.

DISMANTLING JOINT

BENEFITS / PROPERTIES

Dismantling joints are designed to provide greater versatility for the designer at the planning stage and the contractor at the installation and maintenance stage of flanged piping systems. Dismantling joints are predominantly used in pump stations and valve chambers.

SPECIFICATIONS

» Pressure: Up to PN64
» Available sizes: DN40 to DN3000
» Available in any flange drilling

FLANGE ADAPTOR

BENEFITS / PROPERTIES

Unifit flange adaptors are used for joining flanged pipeline components to plain-ended pipes and have wide sealing tolerances that can suit various flange drillings.

SPECIFICATIONS

» Pressure: Up to PN64
» Available sizes: DN40 to DN3000
» Available in any flange drilling and suitable for most common pipe materials

ULTRA REPAIR CLAMP

BENEFITS / PROPERTIES

The Ultra range comprises clamps, saddles and tees. It represents a comprehensive range of stainless-steel products for tapping and repairing pipes permanently and easily. They meet a wide variety of needs. It is important to note that clamps and tapping products in this range are not intended for joining pipes.

SPECIFICATIONS

» Pressure: Up to 16 bar
» Available sizes: DN15 to DN1200
» Suitable for most common pipe materials

G-FLEX STAINLESS-STEEL REPAIR COUPLING

BENEFITS / PROPERTIES

The G-Flex repair coupling is the ideal solution for all situations where permanent repair of a pressure pipe is required. Simply open up the coupling, wrap it around the pipe and tighten the bolts. The pipe is repaired within minutes, thereby avoiding costly downtime. Manufactured from stainless steel, the G-Flex repair coupling exhibits excellent corrosion resistance.

SPECIFICATIONS

» Pressure: Up to 30 bar
» Available sizes: DN20 to DN3000
» Suitable for most common pipe materials

POLYGRIP COUPLING

BENEFITS / PROPERTIES

The PolyGrip range was created to offer a straightforward and efficient method for mechanically joining PVC and HDPE pipes, specifically for end restraint capability. The range also includes flange adaptors and harnesses, all designed to provide support and secure pipe connections, preventing both pipe collapse and pipe end pullout.

SPECIFICATIONS

» Pressure: Up to 16 bar
» Available sizes: DN63 to DN315
» To suit HDPE and PVC pipes

BUFFALO SADDLE

BENEFITS / PROPERTIES

Buffalo Saddles are designed to offer the installer a universal saddles that will accommodate almost all rigid pipe diameters of a specific pipe outside diameter (OD).

SPECIFICATIONS

» Pressure: Up to 16 bar
» Available sizes: DN50 to DN600
» Outlet: DN20 BSP to DN100 BSP, DN50 to DN100 flanged
» Suitable for most common pipe materials

EXPANSION JOINTS

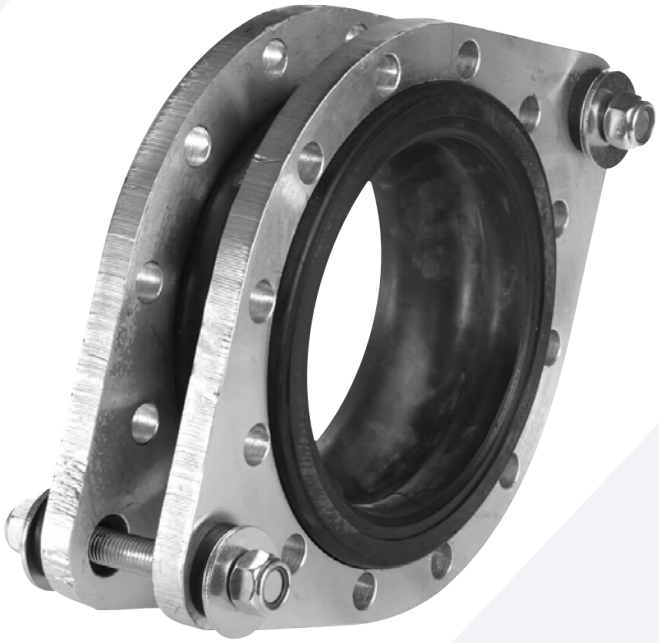
RUBBER BELLOWS

BENEFITS

Rubber expansion joints are flexible units that are manufactured from natural or synthetic elastomers. Rubber expansion joints are the perfect solution for pipe systems to absorb movements, vibrations or noise, resulting in in a significantly prolonged service life of the piping and connected equipment.

A good solution for vibration, noise and misalignment challenges. Flanges are available in electrogalvanized carbon steel, stainless steel or plant-specific materials.

Rubber bellows are available with limit rods to provide a safe, reliable, durable and maintenance free solution. The flexible element may be manufactured from various elastomeric materials to suit the required temperature, chemical and corrosion resistance of the application.



These types of expansion joints find safe application in many industries.

SPECIFICATIONS

Pressure: Up to 16 bar*
Temperature: Dependent on the materials of construction

*Maximum pressures and temperatures should not be used in conjunction.

STAINLESS STEEL BELLOWS

KEY FEATURES

Metal expansion joints consist of a flexible bellow element with various end connections, such as flanges, butt welds or threaded ends to allow connection to the adjacent piping or equipment.

Metal expansion joints are manufactured from relatively thin-walled tubing to form a flexible bellow element.

BENEFITS

Metal expansion joints provide a high integrity, high pressure, high temperature and maintenance-free flexible joint within the piping system. This reduces stresses caused by thermal expansion and contraction by absorbing pipework and equipment movement.

As stainless steel bellows are compact, it may be used in areas of the plant where space may be limited.

SPECIFICATIONS

KLINGER manufactures and supplies a wide variety of expansion joints from DN80 to DN6000, including specially designed and customer-specified systems.

Pressure: Up to 150 bar*
Temperature: Up to 900 °C*

*Maximum pressures and temperatures should not be used in conjunction.

Expansion joint designs are in accordance with the latest edition of international design codes such as EJMA (Expansion Joint Manufacturers Association), ASME VIII Appendix 26, ASME B31.3.

FABRIC EXPANSION JOINTS

KEY FEATURES

Fabric expansion joints are flexible connectors designed to provide stress relief, reduce vibration and noise as well as sealing in ducting systems carrying gaseous media.

These joints are fabricated from a wide variety of materials, including polymers, synthetic elastomers, fabrics, insulation materials and fluoroplastics, to suit various applications.

BENEFITS

- Expansion or contraction of the duct due to thermal cycling
- Isolation of components to minimize the effects of vibration or noise
- Movement of components during process operations
- May be manufactured by combining various layers of engineering fabrics to suit the pressure, temperature and movement of the application.

SPECIFICATIONS

Pressure: Up to 50 KPa*
Temperature: Up to 900 °C*

*Maximum pressures and temperatures should not be used in conjunction.

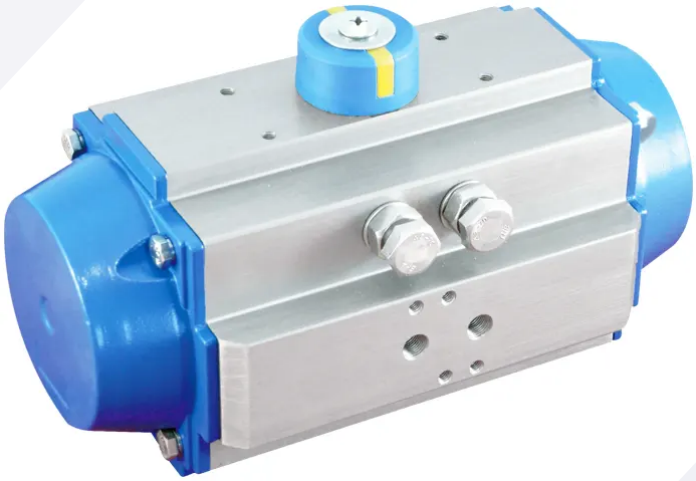
INSTRUMENTATION

ACTUATORS

BENEFITS / PROPERTIES

Actuators are used for the automation of industrial valves and are found throughout the mining industry. This allows for easy process control of the entire plant even over vast distances. Actuators may be pneumatically, hydraulically, or electrically controlled and are available in a single-acting and double-acting configuration.

Actuators either produce a rotary or linear motion and may be configured with the use of springs to fail open or fail closed. Actuators may be fitted with limit switches and position indicators.



PRODUCT OVERVIEW

Product and process mapping mining

PROCESS STEP	APPLICATIONS	VALVES	GASKETS
Shaft / underground mining	Dewatering slurry Cooling water Potable water Firewater Wastewater Ventilation/ducting	Butterfly valves Knife gate valves Globe valves Pressure-reducing valves Check valves Foot valves Plug valves Diaphragm valves Pinch valves Ball valves Piston valves	Spiral wound gaskets KLINGERSIL C-4430 KLINGERSIL C-4324 Rubber insertion
Surface / open-pit / open-cast mining	Dewatering slurry	Butterfly valves Knife gate valves Check valves Diaphragm valves Pinch valves Foot valves	KLINGERSIL C-4324 Rubber insertion Rubber-steel gaskets
Alluvial / placer mining	Dewatering slurry Feedstock slurry	Butterfly valves Knife gate valves Check valves Diaphragm valves Pinch valves Foot valves	KLINGERSIL C-4430 KLINGERSIL C-4324 Rubber insertion Rubber-steel gaskets
In-situ / solution mining	Feedstock slurry Chemicals handling	Butterfly valves Knife gate valves Check valves Diaphragm valves Pinch valves Foot valves Plug valves Pressure-reducing valves	Spiral wound gaskets KLINGERSIL C-8200 KLINGERSIL C-4324 TopChem 2000 TopChem 2003 TopChem 2005 Envelope gaskets Rubber-steel gaskets
Comminution	Feedstock slurry	Butterfly valves Knife gate valves	KLINGERSIL C-4324 Rubber insertion Rubber-steel gaskets

GLAND PACKING	EXPANSION JOINTS	INSTRUMENTATION	PIPE PRODUCTS
K7302DL K25 K4313 K20 K54	Rubber bellows Stainless steel bellows Fabric compensators	Actuators	Dismantling joints Flange adaptors G-Flex repair coupling Ultra repair clamps Buffalo saddles
K7302DL K25 K4313 K20 K54	Rubber bellows	Actuators	Dismantling joints Flange adaptors G-Flex repair coupling Ultra repair clamps PolyGrip couplings Long barrel couplings
K7302DL K25 K4313 K20 K54	Rubber bellows	Actuators	Dismantling joints Flange adaptors G-Flex repair coupling Ultra repair clamps PolyGrip couplings Long barrel couplings
K7302DL K25 K4313 K20 K54	Rubber bellows Stainless steel bellows	Actuators	Dismantling joints Flange adaptors G-Flex repair coupling Ultra repair clamps PolyGrip couplings Long barrel couplings
K7302DL K25 K4313 K20 K54	Rubber bellows	Actuators	Long barrel couplings PolyGrip couplings

PRODUCT OVERVIEW

Product and process mapping mining

PROCESS STEP	APPLICATIONS	VALVES	GASKETS
Particle concentration / mineral extraction (gravity, froth / flotation, magnetic)	**Feedstock slurry**	Butterfly valves Knife gate valves Diaphragm valves Pinch valves	KLINGERSIL C-4324 Rubber insertion Rubber-steel gaskets
Smelting	**High temperature**	Butterfly valves Knife gate valves	Milam PSS
Leaching and digestion	**Feedstock slurry**	Butterfly valves Knife gate valves Globe valves Plug valves Diaphragm valves Pinch valves	TopChem 2000 TopChem 2003 TopChem 2005 TopChem 2006 Envelope gaskets KLINGERSIL C-8200 Monel spiral wound gaskets
	Chemicals		
Thickening and filtration	**Feedstock slurry**	Butterfly valves Knife gate valves Diaphragm valves Pinch valves Piston valves	KLINGERSIL C-4324 Rubber insertion Rubber-steel gaskets
	Flocculents		
Liquation and distillation	**High temperature**	Butterfly valves Knife gate valves	Milam PSS
Vapor phase, zone refining, chromatographic refining	**Feedstock slurry**	Butterfly valves Knife gate valves Globe valves Plug valves Ball valves	Milam PSS TopChem 2000 TopChem 2003 TopChem 2005 TopChem 2006 Envelope gaskets KLINGERSIL C-8200 Monel spiral wound gaskets
	Chemicals		
	High temperature		

GLAND PACKING	EXPANSION JOINTS	INSTRUMENTATION	PIPE PRODUCTS
K7302DL K25 K4313 K20 K54	Rubber bellows	Actuators	Long barrel couplings PolyGrip couplings Flange adaptors G-Flex repair coupling Ultra repair clamps
K54 K7301	Stainless steel bellows	Actuators	
K54		Actuators	
K7302DL K25 K4313 K20 K54	Rubber bellows	Actuators	Long barrel couplings PolyGrip couplings Dismantling joints Flange adaptors G-Flex repair coupling Ultra repair clamps
K7301		Actuators	
K7301		Actuators	

PRODUCT OVERVIEW

Product and process mapping mining

PROCESS STEP	APPLICATIONS	VALVES	GASKETS
Electrolytic refining	Non-aggressive chemicals	Ball valves Plug valves Piston valves	EPDM KLINGERSIL C-4324 KLINGERSIL C-4243 Rubber-steel gaskets
Tailings management	Dewatering slurry	Butterfly valves Knife gate valves Diaphragm valves Pinch valves Check valves Foot valves	KLINGERSIL C-4324 KLINGERSIL C-4243 Rubber insertion Rubber-steel gaskets
	Tailings		

GLAND PACKING	EXPANSION JOINTS	INSTRUMENTATION	PIPE PRODUCTS
K54	Rubber bellows	Actuators	Long barrel couplings PolyGrip couplings Dismantling joints Flange adaptors G-Flex repair coupling Ultra repair clamps Buffalo saddles
K7302DL K25 K4313 K20 K54	Rubber bellows	Actuators	Long barrel couplings PolyGrip couplings Dismantling joints Flange adaptors G-Flex repair coupling Ultra repair clamps Buffalo saddles


KLINGER GROUP
Visionary by Tradition

KLINGER
The Netherlands

KLINGER The Netherlands
Nikkelstraat 2
3067 GR Rotterdam
info@klinger.nl
T +31 (0)10 455 75 55

KLINGER Service Center Limburg
Business Park Stein 208A
6181 MB Elsloo
limburg@klinger.nl
T +31 (0)46 7600 600

www.klinger.nl