KLINGER
trusted. worldwide.

# PRODUCTS

## for Pulp & Paper Plants



www.klinger-international.com

# KLINGER GROUP
## Visionary by Tradition



## KLINGER is the world's leading manufacturer and provider of sealing and fluid control solutions.

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 form 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 around 2,900 people worldwide with total annual sales of around 686 million euros.

### € 686 MIO. ANNUAL SALES
686 million euros in revenue generated by the KLINGER Group per year.

### 2,900 EMPLOYEES
Our global workforce is 2,900 people strong.

### 80 MARKETS
The 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 at home all over the world.

### 93 LOCATIONS
With a presence in more than 90 locations worldwide, KLINGER is an international enterprise.



# PLANT VIEW

## Chemical pulping process

The first phase in the pulping process is the debarking of wood logs in a woodyard. The wood is then cut into chips which are fed to the cooking towers, digesters, and are cooked with chemicals at a temperature of 160 °C. The result of the digestion process is unbleached pulp and black liquor. The pulp will be refined in the washing, screening and bleaching stages into the fine end product. The black liquor goes through an evaporation process where the solid content is increased up to 90 %. Dry black liquor is burned in the recovery boiler and after recausticizing returned to the digestion process.

## WOODYARD

In the woodyard, the wood material is ground into chips, which are fed into the next process phase, digestion. If the wood comes to the mill as round logs directly from the forest, the wood is run through the debarking drum, where the bark is removed and the logs are washed with water. Wood material can also come to the site as sawdust or in prechipped form from another location, but it has to be small enough for the cooking process.

## COOKING

In the ccoking process, the wood chips are fed into the digester together with a chemical, white liquor. The chips and the white liquor then cooked in steam at a temperature of 160 °C to separate the fibers from the lignin and other extractive materials. After cooking, the pulp enters a pressure vessel where the remaining steam and volatile compounds are removed. The cooking liquor has turned dark and has collected lignin and other impurities. The black liquor is returned to the chemical recovery cycle for evaporation.

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## WASHING, SCREENING AND BLEACHING

The brown stock is washed with water to remove residues of cooking liquor and other impurities. After this it is screened to remove undigested wooden particles like knots from raw pulp (brown stock). In the bleaching step, the rest of the lignine and other coloring impurities are removed from the stock to achieve white or light-colored pulp for paper or cardboard manufacturing. Bleaching is normally done as a multistage process with different stages of removing different impurities from the pulp. These stages normally use chlorine gas and dioxide, sodium hypochlorite, hydrogen peroxide and oxygen, which requires special products.

## EVAPORATION

The evaporation process increases the dry solid content of the black liquor from 15 % to 90 % dry solid content as a burning black liquor. During evaporation, the moisture content of the black liquor decreases and at the same time volatile compounds are released. Volatile compounds are burned in a boiler to avoid unnecessary fugitive emissions from the plant. When the dry solid content is approximately 80 to 90 %, the black liquor is burned in the recovery boiler where all organic residues from wood cooking are converted into energy.

## RECOVERY BOILER

After evaporation, concentrated cooking chemicals are fed into the recovery boiler. The black liquor burns and generates steam and electricity for other processes. After burning, the black liquor turns into green liquor, which then turns into white liquor after causticizing and is returned to the start of the bleaching process.

## WHITE LIQUOR PLANT

In the causticizing process, the green liquor from the recovery boiler is treated with burnt lime which converts the sodium carbonate from the green liquor into sodium hydroxide. The formed white liquor is fed into the cooking process, and the next cycle in the recycling process of the chemicals starts.

# BALLOSTAR BALL VALVES KHA

## THE NEW KHA – THE MULTI-TALENTED PRODUCT FOR MANY APPLICATIONS

In this context, the Ballostar KHA offers a more stable bolting of the body with shorter bolts for greater mechanical stability with regard to thermal expansion.

A wide range of types due to the modular construction system characterises these 3-piece ball valves. Three kinds of connections, six types of sealing elements and three stuffing box designs ensure that Ballostar KHA ball valves are suitable for many different operating conditions and applications.





### FIRE SAFETY

Ball valves can be used for fire safe applications at any given time as the basic design is already certified per default.

### IMPROVED CORROSION PROTECTION

KLINGER Advanced Corrosion Protection is a newly developed, special coating process with galvanic coating ensuring improved protection against corrosion.

### SERIAL ANTISTATIC

The Ballostar KHA series features antistatic components as standard in accordance with ISO 7121 and EN 1983 respectively.

### TA-LUFT (VDI 2440)

The standard stuffing box meets the requirements of TA Luft (VDI 2440). Double sealing at the body division by means of the KLINGERSIL C-4430 soft gasket protects against external leakages and meets the highest helium emission testing requirements. Also available in EN 15848.

### OXYGEN DESIGN

Due to the fact that increased concentrations of oxygen lead to greater fire and explosion hazards, a valve must also meet certain prerequisites with regard to oxygen.



## BALLOSTAR BALL VALVE KHE

### BENEFITS / PROPERTIES

2-piece body, flanged ball valve optimized for the process industry. Due to the 2-piece body construction, 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 in 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



## BALL VALVE KHD

### BENEFITS / PROPERTIES

KHD series ball valves for general applications, e.g. different materials for water, air and for most standard process media such as pulp and other non-burning gases and liquids. As standard with lockable handle. Ball valves come with RPTFE seats, full bore, 3-piece, with weld thread ends or with flanges.

### SPECIFICATIONS

Available in materials CF8M and carbon-steel. Valve meets standards for pressure classes PN50 and ANSI Class 300. Standard sizes are DN10–DN100 (3/8”–4”) but up to DN600 (24”) optionally available.



## BALL VALVE KHD

### BENEFITS / PROPERTIES

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

### SPECIFICATIONS

Available in material CF8M. Pressure classes in EN standard is PN10-40 and in ANSI, Class 150 and 300 Standard sizes are DN25–300 (1”–12”) but up to DN600 (24”) optionally available.



## PISTON VALVE KVN

### BENEFITS / PROPERTIES

KVN series piston valve with hand wheel for flow media such as steam, water and standard gases. Piston valves can be used as control or shutoff valves. The piston valve has a unique graphite seat system which allows its use in contaminated media substituting globe valves, for example. Valve connection with weld ends, threads and flanges.

### SPECIFICATIONS

Fire-Safe. Valve for oxygen service. Valve on the basis of TA Luft. Emission testing ISO 15848. Valve materials stainless steel, carbon-steel and cast iron with pressure class PN16-63 and ANSI Class 150 and 300.



## BUTTERFLY VALVE KKD

### BENEFITS / PROPERTIES

KKD series butterfly valves are suitable for different substances. Flow medias such as steam, water and standard gases can be controlled or valves can be used as closing valve in different process applications. Fitted with handle or manual gear. Butterfly valves come with metal or PTFE seat and are installed between flanges.

### SPECIFICATIONS

Valve materials CF8M (carbon-steel available) and pressure classes in EN standard are PN10-40 and ANSI Class 150 and 300. Standard sizes are DN80–DN600 (3”–24”) but up to DN1,200 (48”) optionally available.



## BUTTERFLY VALVE KKD

### BENEFITS / PROPERTIES

KKD series butterfly valve with EPDM lining 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 manual gear.

### SPECIFICATIONS

Valve materials cast iron (carbon-steel also available) body and pressure classes in EN standard are PN10-25 and ANSI Class 150. Different lining materials EPDM, PTFE, NBR, Viton and Hypalon. Standard sizes are DN50–DN600 (2”–24”) but up to DN1,000 (20”) optionally available.



## CHECK VALVE KRC

### BENEFITS / PROPERTIES

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

### SPECIFICATIONS

Valve material CF8M with pressure classes PN10-40 and ANSI Class 150 and 300. (Special materials AISI317 and SMO also available for bleaching application) Standard sizes are DN50–DN600 (2”–24”) but up to DN1,000 (20”) optionally available.



## CHECK VALVE KRG

### BENEFITS / PROPERTIES

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

### SPECIFICATIONS

Valve material CF8M with pressure classes PN10-40 and ANSI Class 150 and 300. Standard sizes are DN10–DN100 (3/8”–4”).



## CHECK VALVE KRD

### BENEFITS / PROPERTIES

KRD series check valves suitable for different substances such as steam, water, air and for most standard process medias such as pulp, but also for burning gases and liquids. Check valves are swing type with metal seat, flanges or weld ends.

### SPECIFICATIONS

Valve materials carbon-steel and CF8M and pressure classes in EN standard are PN10-40 and ANSI Class 150 and 300. Higher pressure classes are available by request. Standard sizes are DN80–DN600 (3”–24”) but up to DN900 (36”) optionally available.



## BALL VALVE KHY

### BENEFITS / PROPERTIES

KHY series ball valves with lockable handle for chemically demanding applications such as chlorine dioxides and acids used in e.g. pulp bleeching processes. Ball valves come with FEP lining and seats, full bore, 2- or 3-piece design, with flanges.

### SPECIFICATIONS

Valve material carbon-steel (CF8M available) with PTFE, FEP or PFA lining. Pressure class for valves are PN10-25 and ANSI Class 150 (Class 300 flange drillings are also available). Standard sizes are DN15–DN300 (1/2”–12”).



## BUTTERFLY VALVE KKY

### BENEFITS / PROPERTIES

KKY series butterfly valves for chemically demanding applications such as chlorine dioxides and acids used in e.g. pulp bleeching processes. Butterfly valves can be used as control or shut-off valve. Fitted with handle or with manual gear. Valves come with PTFE lining and are installed between flanges.

### SPECIFICATIONS

Valve material carbon-steel (CF8M available) with PTFE, FEP or PFA lining. Pressure class for valves are PN10-25 and ANSI Class 150 (Class 300 flange drillings also available). Standard sizes are DN80–DN600 (3”–24”).



## CHECK VALVE KRY

### BENEFITS / PROPERTIES

KRY series check valves for chemically demanding applications such as chlorine dioxides and acids used in e.g. pulp bleeching processes. Check valves come with FEP lining and seats, with flanges.

### SPECIFICATIONS

Valve material carbon-steel (CF8M available) with PTFE, FEP or PFA lining. Pressure class for valves are PN10-25 and ANSI Class 150 (Class 300 flange drillings also available). Standard sizes are DN15–DN300 (1/2”–12”).



## SLIDE GATE VALVE KSD

### BENEFITS / PROPERTIES

KSD series gate valve with handle or with manual gear suitable for different substances. Flow medias such as pulp stock and dispersion waters. Gate valves come with metal seat, EPDM or PTFE seat and are installed between flanges.

### SPECIFICATIONS

Valve material CF8M (carbon-steel also available) and pressure classes in EN standard are PN10-25 and ANSI Class 150. Standard sizes are DN50–DN600 (2”–24”) but up to DN1,200 (48”) optionally available.



## GATE VALVE KSD

### BENEFITS / PROPERTIES

KSD series gate valve with hand wheel for flow medias such as steam, water and standard gases. Gate valves come with metal seat and are installed with flanges, weld ends or threaded ends.

### SPECIFICATIONS

Valve materials carbon-steel and CF8M, and pressure classes in ANSI Class 800. Higher pressure classes are available by request. Standard sizes are DN10–DN50 (3/8”–2”).



## GATE VALVE KSD

### BENEFITS / PROPERTIES

KSD series gate valve with hand wheel or with manual gear for flow media such as steam, water and standard gases. Gate valves have a metal seat and are installed with flanges or with butt weld ends.

### SPECIFICATIONS

Valve materials carbon-steel and CF8M, and pressure classes in EN standard are PN10-40 and ANSI Class 150 and 300. Higher pressure classes are available by request. Standard sizes are DN80–DN600 (3”–24”) but up to DN1,200 (48”) optionally available.



## GLOBE VALVE KAD

### BENEFITS / PROPERTIES

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–DN400 (2”–16”).



## GLOBE VALVE KAD

### BENEFITS / PROPERTIES

KAD series globe valve with hand wheel for flow medias such as steam, water and and standard gases. Globe valves have a metal seat and are installed with flanges or weld/threaded ends.

### SPECIFICATIONS

Valve materials carbon-steel and CF8M, and pressure class is ANSI Class 800. Higher pressure classes are available by request. Standard sizes are DN10–DN50 (3/8”–2”).



## PLUG VALVE KPZ

### BENEFITS / PROPERTIES

KPZ series plug valves are suitable for different demanding medias such as black liquor and other substances which require a valve with no gap between body and obturator. Fitted with handle or manual gear. Plug valves come with RPTFE sleeve, reduced bore, with flanges or weld/threaded ends.

### SPECIFICATIONS

Valve materials Duplex, CF8M and carbon-steel (Hastelloy also available) and valves in pressure classes ANSI Class 150–600. (Drillings for PN ratings available) Standard sizes are DN15–DN500 (1/2”–20”) but up to DN700 (28”) optionally available.



## VALVES WITH SPECIAL CONNECTIONS

### BENEFITS / PROPERTIES

Special connection valves have a significantly smaller gap between the obturator and the wall of the pipe or the vessel. This reduces the possibility of a clocking effect and all drains will work as planned. These special ends can be fitted to many valves but three-piece ball valves will gain most benefits from the design.

### SPECIFICATIONS

The material of the valve and special flange can be selected freely according to customer needs. Different valve and pipe connection sizes do not restrict the connection, but valve size has to be a couple of sizes smaller than the pipe (e.g. DN50 valve connecting to DN150 pipe)



## FLANGE TRANSMITTER VALVE

### BENEFITS / PROPERTIES

The flange transmitter valve is manufactured as a one-piece ball valve with special bolts and flange, which has a flushing connection and closing valve. This valve is used as a root valve between the vessel and process instruments, for example a pressure indicator. Different materials can be chosen according to customer requirements.

### SPECIFICATIONS

Most common size is DN80, different sizes upon request. Flushing with water and/or steam available.



## SAMPLING VALVE

### BENEFITS / PROPERTIES

KLINGER provides many types of sampling valves. Piston type manual sampling valves, ball valves with spring closing action and with different collecting systems.

### SPECIFICATIONS

Valves made of stainless steel, duplex or PTFE-lined according to customers needs. Valves can also be equipped with flushing ports.



## SIGHT FLOW INDICATOR

### BENEFITS / PROPERTIES

Sight flow indicators are added to the process line to see if there is a flow in the pipeline. For gaseous materials, the flow is normally shown by a spinner behind the glass.

### SPECIFICATIONS

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



## STRAINER

### BENEFITS / PROPERTIES

The purpose of a strainer is to remove solid particles from the fluid. The size of enter the process, 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 is the world's leading manufacturer and provider of industrial gaskets and valves.



## SAFETY VALVE

### BENEFITS / PROPERTIES

Safety valves secure the process, process vessels and pipes from high pressure peaks. Safety valves can be divided into two categories: capacitive safety valves, which are always calculated for a specific process or a part thereof, and expansion safety valves where the valve's maximum flow is given in the opening pressure.

### SPECIFICATIONS

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



## STEAM TRAP

### BENEFITS / PROPERTIES

Steam traps are part of the process to remove condensate water from the steam system. The function of the steam trap is either mechanical (inverted steam trap bucket, float) or operated by temperature/pressure-ratio (thermodynamic, thermic). When the steam trap is working together with the heat exchanger, trap capacity has to be calculated according to the capacity of the exchanger.

### SPECIFICATIONS

Materials for steam traps are cast iron, carbon-steel and stainless steel. Cast iron is quite common as it has better heat transfer abilities. As a result, the traps perform better. Sizes are usually from DN15–DN50 but bigger steam traps are also available for high-capacity heat exchangers.



## PRESSURE REDUCING VALVE

### BENEFITS / PROPERTIES

Pressure reducing valves lower the inlet pressure to the outlet pressure. Basic model reduces the pressure evenly by using spring force. When the inlet pressure varies, the outlet pressure also varies. By adding a pressure connection from the downstream side to the actuator of the reducer, it is possible to stabilize the downstream pressure at a constant.

### SPECIFICATIONS

Normal materials for pressure reducing valves are carbon-steel and stainless steel. Flow medias are normally gaseous or fluids which do not contain coarse material. Pressure reducing valves are always calculated according to process requirements.

# CONTROL & ON/OFF VALVES

## BALL VALVE WITH ACTUATOR



### SELECTION

Both pneumatic and electric actuators can be used for the automation of ball valves. The determination of the torque needed by the customer saves investment and follow-up costs. Even though the selection of the actuator can be made according to valve maximum torque tolerance, it is highly recommended that the actuator is selected according to actual needs. In this context, the necessary pressure differential determines the torque of the required actuator. Ball valves operation degrees are 0-90.

### CONTROL

As a control valve, a standard ball valve acts more like a throttling valve. If there is a possibility to use V-port ball or segment ball design inside the valve, then ball valves turn out to be very good and sharp control valves, whose control characteristics can be adjusted exactly to customer needs within the process.





## SEGMENTED BALL CONTROL VALVES

### SELECTION

Segmented ball control valves are normally controlled with pneumatic actuators because of control response time. Segmented ball valves are the most common type to control liquids and fluids which contain solid materials, but can be used also for different gases like steam and air. Operation type is quarter-turn movement.

### CONTROL

Segmented ball valves usually are one-step control valves. If the noise level is too high, the valve can be equipped with a noise reduction obturator, suitable for most gases and non-fibrous liquids. The control area is wide and linear with segmented ball valves, and can be modified specifically on the closing side with a differently shaped obturator.



## BUTTERFLY VALVE WITH ACTUATOR

### SELECTION

Both pneumatic and electric actuators can be used for the automation of butterfly valves. Actuator should be selected in accordance with the needed torque values and the required operation times. Valves operate from 0–90 degrees.

### CONTROL

As a control valve standard, a butterfly valve is preferably applicable in standard control ranges from 10–80 degrees from closed position. There are also special designs available for reducing the cavitation phenomena and to modify control abilities especially in low-pressure stream control.



## SLIDE GATE VALVE WITH ACTUATOR

### SELECTION

Both pneumatic and electric actuators can be used for the automation of slide gate valves. Actuator should be selected in accordance with the needed torque values and which kind of operation times are required. Operation type is linear movement.

### CONTROL

Standard gate valves are not suitable in control applications, but there are also special ports for controlling the fluid and special materials for resisting corrosion of the slide.





## GLOBE CONTROL VALVES

### SELECTION

Globe control valves are normally controlled with pneumatic or even hydraulic actuators because of the control response time. Globe control valves are the most common type to control steam and gas media, but can be used for most fluids. Operation type is linear movement.

### CONTROL

Globe control valves can be one-step control valves, but several pressure reducing points can additionally be installed inside the valve. This enables higher reduction without increasing cavitation and the noise level.



## PNEUMATIC ACTUATORS

### BENEFITS / PROPERTIES

Pneumatic actuators are the most common actuators for quarter-turn valves to open/closed or control actuators. Actuators can be only with pneumatic operation (DA) or another direction is build to operate with spring force (SR). it is also possible to operate 180 degrees and with hydraulic oil.

### SPECIFICATIONS

Normal pressure in the actuator feed (air) is 4.5–6 barG. There are special products for ATEX zones and also products for different reliability levels (SIL) according to customer specifications. Some manufacturers also produce actuators in material 316 if high chemical resistance is required.



## ELECTRIC ACTUATORS

### BENEFITS / PROPERTIES

Electric actuators come in quarter-turn or multi-turn designs, and operation time is slower than for pneumatic actuators. Biggest advantage compared to pneumatic actuators is strength. Bigger valves require a large amount of force to operate and electric actuators combined with gear units can provide these high forces.

### SPECIFICATIONS

Most actuators use electric power. Since there are different standards for electric power in different countries, the standard has to be known before selecting the actuator for the valve. Products are available for ATEX zones and the most common data transfer protocols are supported by actuators from different suppliers.



## POSITIONERS

### BENEFITS / PROPERTIES

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

### SPECIFICATIONS

Normal pressure for positioners (air) is 4.5–8 barG. There are special products for ATEX zones and also products for different reliability levels (SIL) according to customer specifications. Customers receive position information. In addition, the positioner is able to communicate with the automation system via several protocols.



## LIMIT SWITCHES

### BENEFITS / PROPERTIES

When valves are moving only to open and closed positions without controlling fluids in the middle position, 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 are operating with mechanical or inductive sensors. There are special products for ATEX zones and also products for different reliability levels (SIL) according to customer specifications.



## SOLENOID VALVES

### BENEFITS / PROPERTIES

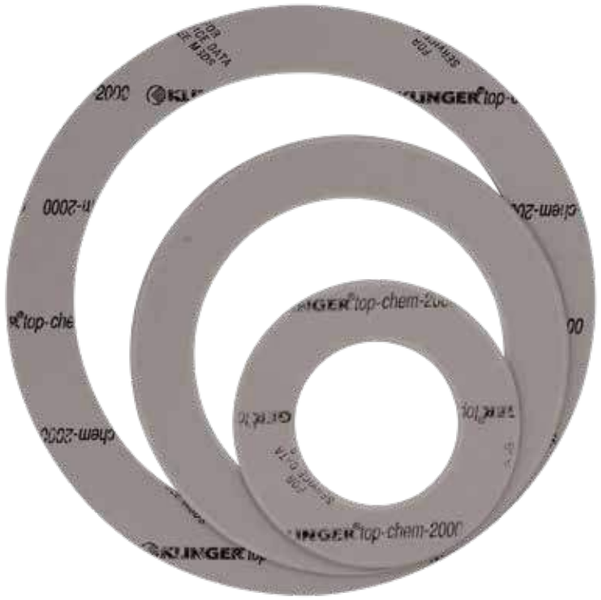
The positioner moves the actuator to the valve position that corresponds to the setpoint.The valve actuator can be driven by a device that feeds the pneumatic air into actuator to move the valve into open or closed position. Special features can be used to move the valve also in the middle positions to gain some control functions.

### SPECIFICATIONS

Normal pressure for solenoid valves (air) is 4.5–8 barG. There are special products for ATEX zones products for different reliability levels (SIL) according to customer specifications.

# GASKETS

## TOPCHEM 2000



### BENEFITS / PROPERTIES

- The perfect universal gasket for heavy-duty applications
- Handles high temperatures in combination with high pressure up to 260 °C
- The only PTFE gasket with API 6FA fire-safe certificate
- Excellent for all types of aggressive media
- FDA conformity for Food & Pharma
- Retained resilience = retorquing not required
- No aging
- No coldflow
- Extreme gas tightness

### SPECIFICATIONS

Modified PTFE.
Dimensions, standard sheet
Size: 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.



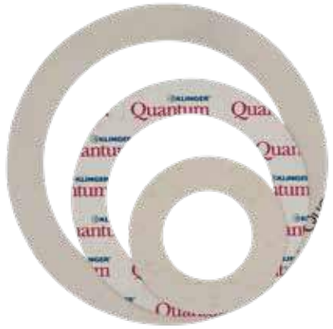
## TOPCHEM 2003

### BENEFITS / PROPERTIES

- Suitable for low temperature and large sealing surfaces
- Excellent for all types of aggressive media
- FDA conformity for Food & Pharma
- Retained resilience = retorquing not required
- No aging
- Excellent adaption to poor flange surfaces
- High gas tightness at low torque

### SPECIFICATIONS

Modified PTFE. Dimensions, standard sheet Size: 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.



## QUANTUM

### BENEFITS / PROPERTIES

Quantum is the first fiber-reinforced gasket material in the world that is exclusively HNBR-bound. 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.

### SPECIFICATIONS

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




## 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 load
- Adapts perfectly to worn and non-parallel flange surfaces
- FDA conformity for Food and Pharma applications
- Excellent for non-metallic plastics and glass flanges
- Suitable for large flange diameters

### SPECIFICATIONS

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



## PSM-AS

### BENEFITS / PROPERTIES

- Handles 450 °C in combination with high pressure in continuous operation
- Suitable for worn flange surfaces
- Excellent in steam applications
- Does not stick on the flange
- Contains no adhesive
- Perforated steel insert which is very resistant to exhaust

Also available as TA Luft-approved in type TSM

### SPECIFICATIONS

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



## 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, standard sheet
Size: 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



## 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, 3 x A self-releasing surfaces.

Dimensions, standard sheet
Size: 1,200 x 1,000 mm, thickness: 1.0 mm, 2.0 mm, 3.0 mm. Tolerances: 1.3 mm thick: ±5 %, 2.0 mm thick: ± 10 %, 3.0 mm thick: ±10 %, length: ±5 %, width: ±5 %. Also available as ring seal gaskets in DIN, ANSI, and user-defined dimensions.



## MAXIFLEX

### BENEFITS / PROPERTIES

- Highly suitable 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 and metal materials to choose from, standard is graphite

### SPECIFICATIONS

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



## 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 and fiberglass-bound with NBR, 3 x A self-releasing surfaces.

Dimensions, standard paper
Size: 1,500 x 2,000 mm, Thickness: 0.5 mm, 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm, 4.0 mm, 5.0 mm. Tolerances: thickness ±10 %, length ±50 mm, width ±50 mm. Also available as ring seal gaskets in DIN, ANSI, and user-defined dimensions.



## KGS GII

### BENEFITS / PROPERTIES

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

### SPECIFICATIONS

Elastomer with steel core. Available elastomers: NR, NBR, EPDM, CSM, FKM, available in DIN dimensions between DN15–DN2,000 and pressure classes between PN6-40.

# COMPRESSION PACKINGS



## TOPLINE 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 alkalies in kraft pulping
» Low friction
» Used in stuffing boxes of pumps and as end rings in high-temperature and pressure valves
» Typical applications within the pulp industry are digesters
» Excellent for feed water pumps

### SPECIFICATIONS

Pure filament carbon fiber impregnated with graphite and other lubricants.

Dimensions, 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. ±0.8 for all others.



## TOPLINE K4259

### 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 speed
» Suitable for mild chemicals or steam
» Does not hydrolyze
» Typical applications in the pulp industry are digesters
» Excellent for pulp, potash, mining and other slurries

### SPECIFICATIONS

Special composite with silicone break-in lubricant.

Dimensions, 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. ±0.8 for all others.



## TOPLINE K1140 GFO®

### BENEFITS / PROPERTIES

» Max. operating temperature: 285 °C
» Max. peripheral speed: 22 m/s
» pH 0–14
» Braided structure: interlock
» Good resilience
» Good thermal conductivity
» Low friction
» Pump packing
» Extremely good chemical resistance
» An excellent universal mill compression packing

### SPECIFICATIONS

Graphited GFO fiber yarn with silicone and PTFE lubricants.

Dimensions, 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, ±0.8 for all others.



## TOPLINE K4257

### BENEFITS / PROPERTIES

» Max. operating temperature: 260 °C
» Max. peripheral speed: 20 m/s
» pH 1–14
» Braided structure: interlock
» Resistant to elevated temperatures and steam
» Resistant to elevated speeds
» No damaging of shafts or sleeves under normal conditions
» Exceptional resilience
» Excellent resistance to high vibration/high velocity
» Typical applications in the pulp industry are digesters
» Developed specifically for wood pulp refiners

### SPECIFICATIONS

Special proprietary fiber blend.

Dimensions, standard package: 8 m/roll
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. ±0.8 for all others.



## TOPLINE K3222 W

### BENEFITS / PROPERTIES

» Min. operating temperature: -200 °C
» Max. operating temperature: 430 °C, suitable for high temperatures, depending on oxygen
» Max. static pressure: 280 bar
» Max. peripheral speed: 20 m/s
» pH 0–14
» Mainly used as valve gaskets
» Can also be used in low temperatures
» Permanent resilience
» Extremely dense, properly compressed
» Can be seen as a universal gasket for valves

### SPECIFICATIONS

Pure graphite gasket with Inconel wire. Dimensions, 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. ±0.8 for all others.



## TOPLINE K54

### BENEFITS / PROPERTIES

» Max. operating temperature: 260 °C (K54S up to 280 °C)
» Max. static pressure: 200 bar
» Max. periphery speed: 10 m/s (5 m/s for K54S)
» pH 0–14
» Suitable for aggressive media
» Pure, non-polluting gasket for foods and pharmaceuticals
» K54H – designed for pumps
» K54S – universal gasket

### SPECIFICATIONS

Pure PTFE gasket.

Dimensions, 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. ±0.8 for all others.



## TOPLINE K10

### BENEFITS / PROPERTIES

» Min. operating temperature: -100 °C
» Max. operating temperature: 260 °C
» Max. static pressure: 100 bar
» Max. peripheral speed: 10 m/s
» pH 2–12
» Cost-effective braid for basic applications
» Pumps and valves in less demanding operations
» PTFE-based lubrication for low friction
» Typical gasket in water and sanitation applications
» Easy to cut and handle
» Pure braiding

### SPECIFICATIONS

Synthetic fiber gasket.

Dimensions, 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. ±0.8 for all others.



## K35 GRAPHITE RINGS

### BENEFITS / PROPERTIES

» Suitable for high to very high temperatures, depending on the oxygen content.
» Also used in low temperatures.
» Mainly used as a valve compression packing.
» Permanent resilience.
» Extremely dense, properly compressed.
» Suitable also for pumps
» pH 0–14

### SPECIFICATIONS

Compression molded graphite rings, pure graphite. Purity: 98 % alt. 99.85 %. Density according to customer request. Dimensions, Supplied in user-defined dimensions.



# EXPANSION JOINTS

## EXTERNALLY PRESSURIZED DB TYPE

### BENEFITS / PROPERTIES

Externally pressurized expansion joints are an excellent answer for large axial displacement needs and pressure is high, and if you would like to avoid U-loops or be in control of your maintenance costs.



### SPECIFICATIONS

» Size: DN25–DN1,000
» Design pressure: up to 40 barG
» Design temperature: up to 400 °C
» Bellows material: AISI 304, 316, 321
» Flange material:
carbon-steel, stainless steel
» Extreme gas tightness



## KB TYPE

### BENEFITS / PROPERTIES

Weld end expansion joints are equipped with carbon-steel or stainless steel pipe connections. Even though they can absorb movements in any direction, this type is mainly used for axial movements. If lateral movement is required, a universal type may be more suitable. These types of expansion joints can be supplied with limit liners, covers, rods, hinges or gimbals.

### SPECIFICATIONS

» Size: DN25–DN1,000 (for other sizes – check with us)
» 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

Fixed flange expansion joints are equipped with welded carbon-steel or stainless steel flanges (EN, ASME or as requested). They absorb mainly axial movements with possibility of some lateral movements. Even though they can absorb movements in any direction, this type is mainly used for axial movements. If lateral movement is required, a universal type may be more suitable. These types of expansion joints can be supplied with limit rod, liners, covers, rods, hinges or gimbals.

### SPECIFICATIONS

» Size: DN25–DN1,000 (for other sizes – check with us)
» Design pressure: up to 16 barG
» Design temperature: up to 400 °C
» Bellows material: AISI 304, 316, 321 or nickel alloys
» Fange material: CS, SS, Custom
» Quick connection



## DF TYPE (FLOATING FLANGE)

### BENEFITS / PROPERTIES

Floating flange expansion joints are equipped with carbon-steel or stainless steel flanges (EN, ASME or as requested). They absorb mainly axial movements with possibility of some lateral movements. Even though they can absorb movements in any direction, this type is mainly used for axial movements. If lateral movement is required, a universal type may be more suitable. Available for exhaust gas, liquid media and steam. Bellows are calculated following latest EJMA standards. Also, floating flange type expansion joints may have double bellows which are designed for absorbing greater lateral movements.

### SPECIFICATIONS

» Size: DN25–DN1,000 (for other sizes – check with us)
» Design pressure: up to 16 barG
» Design temperature: up to 400 °C
» Bellows material: AISI 304, 316, 321 or nickel alloys
» Fange material: CS, SS, Custom
» Quick connection



## CENTRAL HEATING SYSTEM TYPE EXPANSION JOINT

### BENEFITS / PROPERTIES

Prevents deformations in pipes and noise resulting from thermal stresses. Minimum/maximum limits and pretension are observed easily with the help of limiting pin. Internal sleeve prevents pressure losses and misalignments while external cover prevents external damages. Internal sleeve (liner) also prevents “whistling” noise due to flow. Heat and ventilation systems, water pipes etc. in large buildings, hospitals and similar constructions.

### SPECIFICATIONS

» Size: DN15–DN100
» Design pressure: up to 16 barG
» Design temperature: up to 400 °C
» Bellows material: AISI 304, 316, 321
» Balanced material: carbon-steel, stainless steel
» Quick connection



## VIBRATION ABSORBERS

### BENEFITS / PROPERTIES

Metal expansion joints can also be used to absorb vibration 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. While vibration absorbers are mostly used with flanged connections, they can also be supplied with weld connections. A very typical accessory with this type of expansion joint is a limit rod/tie-rod to restrain pressure thrust of bellows or limit excessive design movements. 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–DN500
» Design pressure: up to 16 barG
» Design temperature: up to 400 °C

Bellows materials: AISI 304, 316L, 321
Flange materials: carbon-steel, stainless steel



## RECTANGULAR 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 mostly designed for very low pressure applications such as ducts, exhaust systems, ventilation systems etc. Rectangular metal expansion joints are designed and used in gas turbine exhaust systems, turbine and condenser connections, etc. i.e. 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 corner U-shape) in accordance with required operating conditions.

### SPECIFICATIONS

» Size: custom
» Design pressure: up to 1 barG
» Design temperature: up to 850 °C
» Minimum reaction forces

Bellow materials: CS, AISI 304, 316L, 321
Hardware materials: CS, AISI 304, 316L, 321



## SEISMIC EXPANSION JOINTS WITH RODS

### BENEFITS / PROPERTIES

Metal expansion joints can also be used to absorb movements in piping systems due to earthquakes, ground settlements or landslides. These events can cause large movements in piping systems and cause critical piping systems to fail. Seismic expansion joints are an excellent choice for such applications. They are designed to absorb large axial and lateral movements.

### SPECIFICATIONS

» Size: DN32–250
» Design pressure: up to 16 barG
» Design temperature: up to 400 °C
» Bellows material: AISI 304, 316, 321
» Flange and hardware material: carbon-steel, stainless steel

# INSTRUMENTATION

## REFLEX GAUGES



### BENEFITS / PROPERTIES

Water, liquids and steam.

### SPECIFICATIONS

- Good light/dark contrast gives a clear reading
- Can be delivered with both left- and right-handed controls
- Display can be rotated by 360 degrees
- Pressure class indicates up to 250 bar
- Design temperature: up to 400 °C



## TRANSPARENT GAUGE

### BENEFITS / PROPERTIES

Water, liquids and steam.

### SPECIFICATIONS

- Supplied with original KLINGER borosilicate glass "extra tempered"
- Resistant to high temperatures
- Display can be rotated by 360 degrees
- Pressure class indicates up to 180 bar
- Design temperature: up to 400 °C



## VORTEX FLOW METER LUGB

### BENEFITS / PROPERTIES

LUGB is a vortex flow meter used for liquid, gas and steam measurement. Delivered either with flanges or as wafer. For steam and gas measurement, a model with integrated pressure and temperature sensors is available. In this version, the transmitter includes necessary software algorithms for compensation with most common media.

### SPECIFICATIONS

- Dimensions: DN15–DN300
- Process connections: flange or wafer
- Wetted parts: stainless steel (304 or 316)
- Sensor type: piezoceramic sensor
- Accuracy: liquid ±1 % of measurement value (Re ≥ 20,000)
- Gas/vapor: ±1.5 % of measured value (Re ≥ 20,000)
- Output signal: 4–20 mA, max. load 300 Ohm
- Scaled pulse output
- Communication RS485 (Modbus)



## CORIOLIS MASS FLOW METER U-MASS

### BENEFITS / PROPERTIES

U-Mass is a Coriolis mass flow meter that can be used for liquids and gases in a wide range of applications. The meter is supplied with a built-in or separate transmitter unit.

### SPECIFICATIONS

- Dimensions: DN01–DN250
- Process connection: flange or tri-clamp
- Wetted parts: stainless steel/Hastelloy C
- Measuring ranges: flow 0–20 kg/h to 0–1,800 t/h
- Density: -0.1 g/cm³–2.5 g/cm³
- Accuracy: better than ±0.2 %/option ±0.1 %
- Media temperature: -50 to +180 °C
- Media pressure: standard: 16 bar/option: up to 150 bar
- Output signal: current: 2 pcs analog 4–20 mA
- Scaled pulse/frequency: 0–10 kHz



## THERMAL MASS FLOW METER KLINGER STG-F AND STG-I

### BENEFITS / PROPERTIES

STG-F/I are thermal mass flow meters for pure dry gases. The measuring signal is direct mass flow, independent of pressure and temperature variations.

### SPECIFICATIONS

- Dimensions: DN10–DN4,000
- Process connections: flange or weld connection (hot tap as option)
- Wetted parts: stainless steel (304 or 316)
- Measuring range: 0.1–100 Nm/s
- Accuracy: ±1 %–2.5 % of measurement value
- Supply voltage: 24 VDC (±15 %) or 220 VAC
- Output signal: 4–20 mA max. load 500 Ohm
- Scaled pulse output
- 2 x relay NO, 10A / 220V / AC or 5A / 30V / DC
- Communication: RS485/HART



## TURBINE FLOW METER KLINGER LWGY

### BENEFITS / PROPERTIES

LWGY turbine flow meters are a series of turbine meters suitable for most pure liquids. The meter is made with wetted parts in stainless steel, except for the bearings which are of tungsten carbide.

### SPECIFICATIONS

- Dimensions: DN4–DN200
- Connection: thread or flange
- Measuring tube: stainless steel, Standard: 304/option: 316 L
- Rotor: stainless steel (13 % Cr, 2 % Mo)
- Bearings: tungsten carbide
- Output: pulse (frequency signal)
- 4–20 mA



## OVAL GEAR FLOW METER KLINGER LC

### BENEFITS / PROPERTIES

The oval gear meter is a flow meter type in which a predefined chamber is filled with liquid or emptied. The number of fillings / emptyings is counted as an expression of the amount that has passed through the meter.

### SPECIFICATIONS

- Dimensions: DN10–DN200
- Accuracy: better than 0.5 % (option: 0.2 %)
- Measuring tubes: cast iron, cast steel, stainless steel 304 or 316
- Display: mechanical or LCD
- Output (option): scaled pulse output
- 4–20 mA (2-wire)



## VA FLOW METER KLINGER SH250

### BENEFITS / PROPERTIES

For measuring flow in liquids or gas. The meter can be used for measuring non-conductive media in a typical measuring range of 10:1 – without any form of power supply.

### SPECIFICATIONS

- Dimensions: DN15–DN150
- Operating pressure: up to 40 bar
- Measuring tube: stainless steel 304 or 316
- Floats: stainless steel 304, 316 or PTFE
- Output (option): 1 or 2 alarm relays
- 4–20 mA (2-wire)



## HYDROSTATIC LEVEL MEASUREMENT KLINGER 451DP

### BENEFITS / PROPERTIES

Differential pressure measurement is widely used for level measurement in process tanks isolated from the surroundings, e.g. in the chemical and petrochemical industries. The transmitter is adapted to level measurement, using separating membranes, and mounted to the transmitter with capillary tubes that allow one membrane to be mounted at the bottom and one at the top of the tank.

### SPECIFICATIONS

- Measuring ranges: 0–60 mbar up to 0–100 bar (1 bar = 10 mHO)
- Accuracy: better than ±0.5 %
- Many materials and process connections
- Capillary tube: 2 pcs max. 10 m



## MAGNETIC INDUCTIVE FLOW METER

### BENEFITS / PROPERTIES

KLINGER LDG is a magnetic inductive flow meter for accurate measurement of liquids in all kinds of industrial plants, as well as in water, wastewater and cooling systems.

### SPECIFICATIONS

- Dimensions: DN06–DN2,200
- Output signal: 4–20 mA
- Scaled pulse output
- Status outputs
- Liner: hard rubber, PTFE or PPO
- Electrodes: SS 1.4571, Hastelloy C, tantalum or platinum-iridium alloy
- Communication: HART, Modbus RS485 or GPRS



## GUIDED RADAR 8701

### BENEFITS / PROPERTIES

Microwave radar for continuous level measurement in tanks/silos with liquids or solids.

### SPECIFICATIONS

- Wetted parts: stainless steel 304 or 316L
- Sensor: wire or rod
- Measuring range: up to 30 m
- Accuracy: better than ±5mm
- Output signal: 4–20 mA, 2 or 3-wire



## ULTRASONIC LEVEL TRANSMITTER ULM

### BENEFITS / PROPERTIES

Measurement of liquid levels in open tanks and basins. Can be delivered with separate transmitter.

### SPECIFICATIONS

- Sensor: PTFE or PVDF
- Measuring ranges: 0–5 m up to 0–30 m
- Accuracy: ±0.5 % of measured value
- Output signal: 4–20 mA, 2 or 3-wire



## ULTRASONIC FLOW METER DS116

### BENEFITS / PROPERTIES

DS116 is an ultrasonic flow meter for measuring liquids. The meter is clamped to the outside of the measuring tube.

### SPECIFICATIONS

- Dimension: for pipes DN25–DN1,200
- Measuring range: 0.01–5 m/s
- Accuracy: ±1 % FS
- Supply voltage: 10-36 DCV/max. 1 A (standard version)
- Output signal: scaled pulse
- Output current: 4–20 mA
- Status/alarm output (relay)
- Communication RS232 or RS485 (Modbus)



## PRESSURE GAUGE 208

### BENEFITS / PROPERTIES

Pressure gauge for monitoring all types of pressures in industrial applications. Supplied as standard with glycerin filling.

### SPECIFICATIONS

- Dimensions: Ø 63 mm, Ø 100 mm or Ø 160 mm, 1.4301 (AISI 304)
- Wetted parts: brass or stainless steel (AISI 316)
- Range: -1 bar–1,600 bar according to EN 837-1
- Connection: Thread at bottom or on back



## PRESSURE TRANSMITTER COMPACT 401

### BENEFITS / PROPERTIES

Compact transmitter for measuring pressure in all types of industries. Compact 401 transmitters are also available with local display and/or cooling neck for direct connection to processes with media temperatures of up to 350 °C.

### SPECIFICATIONS

- Enclosure: stainless steel 1.4301 (304)
- Wetted parts: stainless steel 1.4301 (304) or 1.4404 (316L)
- Ranges: 0–10 mbar to 0–1,000 bar (also vacuum)
- Connection: G½* B or M20 x 1,5
- Output: 4–20 mA/2-wire



## PRESSURE TRANSMITTER FIELD 401

### BENEFITS / PROPERTIES

Robust transmitter for measuring pressure in all types of industries. Field 401 is also supplied with a cooling neck for direct connection to processes with media temperatures of up to 350 °C.

### SPECIFICATIONS

- Enclosure: aluminum housing (painted)
- Wetted parts: stainless steel 1.4301 (304) or 1.4404 (316L)
- Ranges: 0–10 mbar to 0–1,000 bar (also vacuum)
- Connection: G½* B or M20 x 1.5
- Output: 4–20 mA m HART protocol



# PRODUCT OVERVIEW

## Product and process mapping – Pulp & Paper

KLINGER trusted. worldwide.

| PROCESS STEP | EQUIPMENT | COMPRESSION PACKINGS | GASKETS | PIPELINE MEDIA VALVES | VALVES | EXPANSION JOINTS | INSTRUMENTATION |
|---|---|---|---|---|---|---|---|
| Woodyard | Debarking pump | TopLine K4259 | Graphite Laminate PSM-AS | Compressed air<br>Circulation water<br>Mill water (mech./chem. treated) | Ball valves<br>**KHA, KHE, KHD**<br>Butterfly valves<br>**KKD, KKQ**<br>Check valves<br>**KRC, KRG, KRD** | Fixed, floating and weld ends for metallic expansion joints with adjustment and/or customization prior to installation<br>Vibration absorber | **Flow measurement**<br>Magnetic flow, ultrasonic, variable area, thermal mass<br>**Pressure**<br>Gauges, transmitters |
| | Flume pump | | | | | | |
| Cooking | Low-pressure feeder | TopLine K3400 | Graphite Laminate PSM-AS (for mild caustic service) | Compressed air<br>Odorous gases<br>Concentrated sulfuric acid<br>Sodium bisulfate solution<br>Oxygen<br>**Liquors:** white, black, cooking<br>Sodium hydroxide (NaOH)<br>Brown stock filtrate<br>Hydrogen peroxide<br>Reject<br>**Steams:** LP LP steam, MP steam, flash steam, exhaust vapors<br>**Condensates:** LP condensate, MP condensate, secondary condensate, kraft mill foul condensate<br>**Waters:** mill water (mech./chem. threated), cooling water, demineralized water, warm water, hot water, sealing water, white water<br>Knots suspension | Ball valves<br>**KHA, KHE, KHD**<br>Butterfly valves<br>**KKD, KKQ**<br>Check valves<br>**KRC, KRG, KRD**<br>Isolation valves (Gate, globe)<br>**KSD, KAD, KVN**<br>Plug valve<br>**KPZ** | Fixed, floating and weld ends for metallic expansion joints with adjustment and/or customization prior to installation<br>Vibration absorber<br>Fabric expansion joints for fans | **Flow measurement**<br>Magnetic flow, vortex, ultrasonic, Coriolis, turbine, oval gear, variable area, thermal mass and dP<br>**Pressure**<br>Gauges, transmitters<br>**Level**<br>Transparent gauges, reflex gauges, magnetic gauges, hydrostatic, ultrasonic, guided radar |
| | Metering valve | TopLine K3222 W | | | | | |
| | Steaming valve | | | | | | |
| | Chemical valve | | TopChem 2000 (for concentrated liquors up to 260 °C) | | | | |
| | High-pressure feeder | TopLine K3400 | | | | | |
| | Inlet device | | | | | | |
| | Liquor circulation pump | | | | | | |
| | B.L. injection pump | | | | | | |
| | Cold blow pump | | | | | | |
| | Displacement digester system | | | | | | |
| Washing, Screening and Bleaching | Black tank agitator | TopLine K4259 | Graphite Laminate PSM-AS | Compressed air<br>Odorous gases<br>Oxygen<br>Sodium hydroxide (NaOH)<br>**Liquors:** black, white, oxidized white liquor<br>Unbleached stock<br>Brown stock filtrate<br>Defoaming agent<br>Hydrogen peroxide<br>Pulp, peroxide stage<br>Reject<br>Semibleached stock (low Cl)<br>Talc slurry<br>**Chlorine dioxide:** water, pulp, filtrate (require PTFE-lined or titanium valves)<br>Concentrated sulfuric acid<br>Sodium bisulfate solution<br>**Steams:** LP steam, MP steam, exhaust vapors<br>**Condensates:** LP condensate, MP condensate, secondary condensate, kraft mill foul condensate<br>**Waters:** mill water (mech./chem. threated), cooling water, demineralized water, warm water, hot water, sealing water, white water<br>Knots suspension | Ball valves<br>**KHA, KHE, KHD**<br>Butterfly valves<br>**KKD, KKQ**<br>Check valves<br>**KRC, KRG, KRD**<br>Isolation valves (Gate, globe)<br>**KSD, KAD, KVN**<br>Plug valve<br>**KPZ**<br>Lined valves for chlorine dioxide<br>**KHY, KKY, KRY** | Fixed, floating and weld ends for metallic expansion joints with adjustment and/or customization prior to installation<br>Vibration absorber<br>Fabric expansion joints for fans | **Flow measurement**<br>Magnetic flow, vortex, ultrasonic, Coriolis, turbine, oval gear, variable area, thermal mass and dP<br>**Pressure**<br>Gauges, transmitters<br>**Level**<br>Transparent gauges, reflex gauges, magnetic gauges, hydrostatic, ultrasonic, guided radar |
| | Thick stock pump | TopLine K3400 | TopChem 2003 | | | | |
| | Pressure screen | TopLine K4259 | Graphite Laminate PSM-AS | | | | |
| | Stock pump | | | | | | |
| | Hot water pump | TopLine K3400 | | | | | |
| | Kamyr washer/drumwashers | TopLine K54H | TopChem 2003 | | | | |
| | Thickener | TopLine K4259 | Graphite Laminate PSM-AS | | | | |
| | Stock pump | | | | | | |
| | Feed pump | | | | | | |
| | Chlorine injection pump | TopLine K1140 GFO® | TopChem 2003 | | | | |
| | Spent acid pump | TopLine K3400 | | | | | |
| | Brine pump | | | | | | |
| | Bleached stock washers | TopLine K4259 | Graphite Laminate PSM-AS | | | | |
| | Vertical hydrapulper | | | | | | |
| | | TopLine K10 | | | | | |
| | Horizontal hydrapulper | TopLine K4259 | | | | | |

# PRODUCT OVERVIEW

## Product and process mapping – Pulp & Paper

KLINGER trusted. worldwide.

| PROCESS STEP | EQUIPMENT | COMPRESSION PACKINGS | GASKETS | PIPELINE MEDIA VALVES | VALVES | EXPANSION JOINTS | INSTRUMENTATION |
|---|---|---|---|---|---|---|---|
| Evaporation | Weak black liquor feed pump | TopLine K3400 | **Maxiflex** (for high-pressure steam above 260 °C) | Compressed air<br>Odorous gases<br>**Black Liquors:** firing black liquor, heavy black liquor, intermediate black liquor, weak black liquor<br>Sodium sulphate<br>Defoaming agent<br>Methanol<br>**Steams:** flash steam, LP steam, MP steam, alkaline flash vapor, secondary vapor<br>**Condensates:** foul condensate, LP condensate, MP condensate, secondary condensate, alkaline condensate<br>**Waters:** mill water (mech/chem threaded), cooling water, hot water, sealing water, potable water | Ball valves<br>**KHA, KHE, KHD**<br>Butterfly valves<br>**KKD, KKQ**<br>Check valves<br>**KRC, KRG, KRD**<br>Isolation valves (Gate, globe)<br>**KSD, KAD, KVN**<br>Plug valve<br>**KPZ**<br>Ball valves<br>**KHA** or Plug **KPZ** with duplex material for black liquor over 80 % solid content | Rubber expansion joints, metallic for hottest temperature >120 °C and externally pressurized for condensate lines<br>Fixed, floating and weld ends for metallic expansion joints with adjustment and/or customization prior to installation<br>Vibration absorber<br>Special vacuum expansion joints with O-ring-faced flange<br>Special customized design. Not on website. | **Flow measurement**<br>Magnetic flow, vortex, ultrasonic, Coriolis, turbine, oval gear, variable area, thermal mass and dP<br>**Pressure**<br>Gauges, transmitters<br>**Level**<br>Transparent gauges, reflex gauges, magnetic gauges, hydrostatic, ultrasonic, guided radar |
| | | | | | | | |
| | Vacuum pump | TopLine K3400 | **TopChem 2000** (for concentrated liquors up to 260 °C) | | | | |
| | Concentrated black liquor pump | | **Graphite Laminate PSM-AS** (for mild caustic service) | | | | |
| | Tall oil pump | | | | | | |
| Recovery Boiler | Nozzle pump | TopLine K3400 | **Graphite Laminate PSM-AS** | Compressed air<br>Odorous gases<br>Incondensable gases<br>Flue gas<br>Petroleum natural gas<br>Boiler drainage<br>**Feed waters:** low, medium and high pressure<br>**Waters:** boiler water, scrubbing water, firefighting water, demineralized water, potable water, cooling water, sealing water, sewage water<br>Oxygen scavenger<br>Hydrazine<br>**Liquors:** weak white liquor, weak black liquor, heavy black liquor, diluted green liquor, raw green liquor<br>Heavy fuel oil<br>**Steams:** sootblowing steam, low-pressure steam, medium-pressure steam<br>**Condensates:** low-pressure condensate, medium-pressure condensate, foul condensate | Ball valves<br>**KHA, KHE, KHD**<br>Butterfly valves<br>**KKD, KKQ**<br>Check valves<br>**KRC, KRG, KRD**<br>Isolation valves (Gate, globe)<br>**KSD, KAD, KVN**<br>Plug valve<br>**KPZ**<br>Ball valves<br>**KHA** or Plug **KPZ** with duplex material for black liquor over 80 % solid content<br>Green liquor requires metal-seated ball valve with scraping seats because of crystallizing behavior | Fixed, floating and weld ends for metallic expansion joints with adjustment and/or customization prior to installation<br>Vibration absorber<br>Fabric expansion joints for fans | **Flow measurement**<br>Magnetic flow, vortex, ultrasonic, Coriolis, turbine, oval gear, variable area, thermal mass and dP<br>**Pressure**<br>Gauges, transmitters<br>**Level**<br>Transparent gauges, reflex gauges, magnetic gauges, hydrostatic, ultrasonic, guided radar |
| | Salt cake injection | TopLine K3400 | | | | | |
| | Soot blowers | K35 Graphite Rings | | | | | |
| | Recycle pumps | TopLine K3400 | | | | | |
| Recausticizing | Green and white liquor | TopLine K3400 | **Graphite Laminate PSM-AS** | Compressed air<br>Odorous gases<br>Formic acid<br>Natural gas<br>Flue gas<br>Propane<br>**Liquors:** green liquor, white liquor, weak white liquor<br>**Limes:** lime mud, lime milk, lime mud filtrate<br>Polymer<br>Sodium hydroxide (NaOH)<br>Diesel oil<br>Heavy fuel oil<br>Methanol<br>**Steams:** LP steam, MP steam<br>**Condensates:** alkaline condensate, foul condensate, secondary condensate<br>**Waters:** cooling water, demineralized water, warm water, hot water, sealing water, firefighting water, potable water, sewage water | Ball valves<br>**KHA, KHE, KHD**<br>Butterfly valves<br>**KKD, KKQ**<br>Check valves<br>**KRC, KRG, KRD**<br>Isolation valves (Gate, globe)<br>**KSD, KAD, KVN**<br>Plug valve<br>**KPZ**<br>Green liquor requires metal-seated ball valve with scraping seats because of crystallizing behavior | Metal and rubber expansion joints and fabric for fans and exterrnally pressurized for steam lines<br>Fixed, floating and weld ends for metallic expansion joints with adjustment and/or customization prior to installation<br>Vibration absorber<br>Fabric expansion joints for fans | **Flow measurement**<br>Magnetic flow, vortex, ultrasonic, Coriolis, turbine, oval gear, variable area, thermal mass and dP<br>**Pressure**<br>Gauges, transmitters<br>**Level**<br>Transparent gauges, reflex gauges, magnetic gauges, hydrostatic, ultrasonic, guided radar |

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