KLINGER Denmark

SOLUTIONS

for the Pharmaceutical Industry

www.klinger.dk

KLINGER GROUP

Visionary by Tradition

KLINGER®
trusted. worldwide.

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

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

686 MIO. ANNUAL SALES

Are generated by the KLINGER Group per year.

2,900 EMPLOYEES

Our global workforce amounts to 2,900 persons worldwide.

80 MARKETS

KLINGER Group has already exported to 80 countries and counting.

18 PRODUCTION SITES

The KLINGER Group manufactures gaskets, valves, measuring instruments, expansion joints and hoses.

60 COUNTRIES

Are home to a KLINGER Group subsidiary or representative.

PLANT VIEW

Pharmaceutical processes – clinical

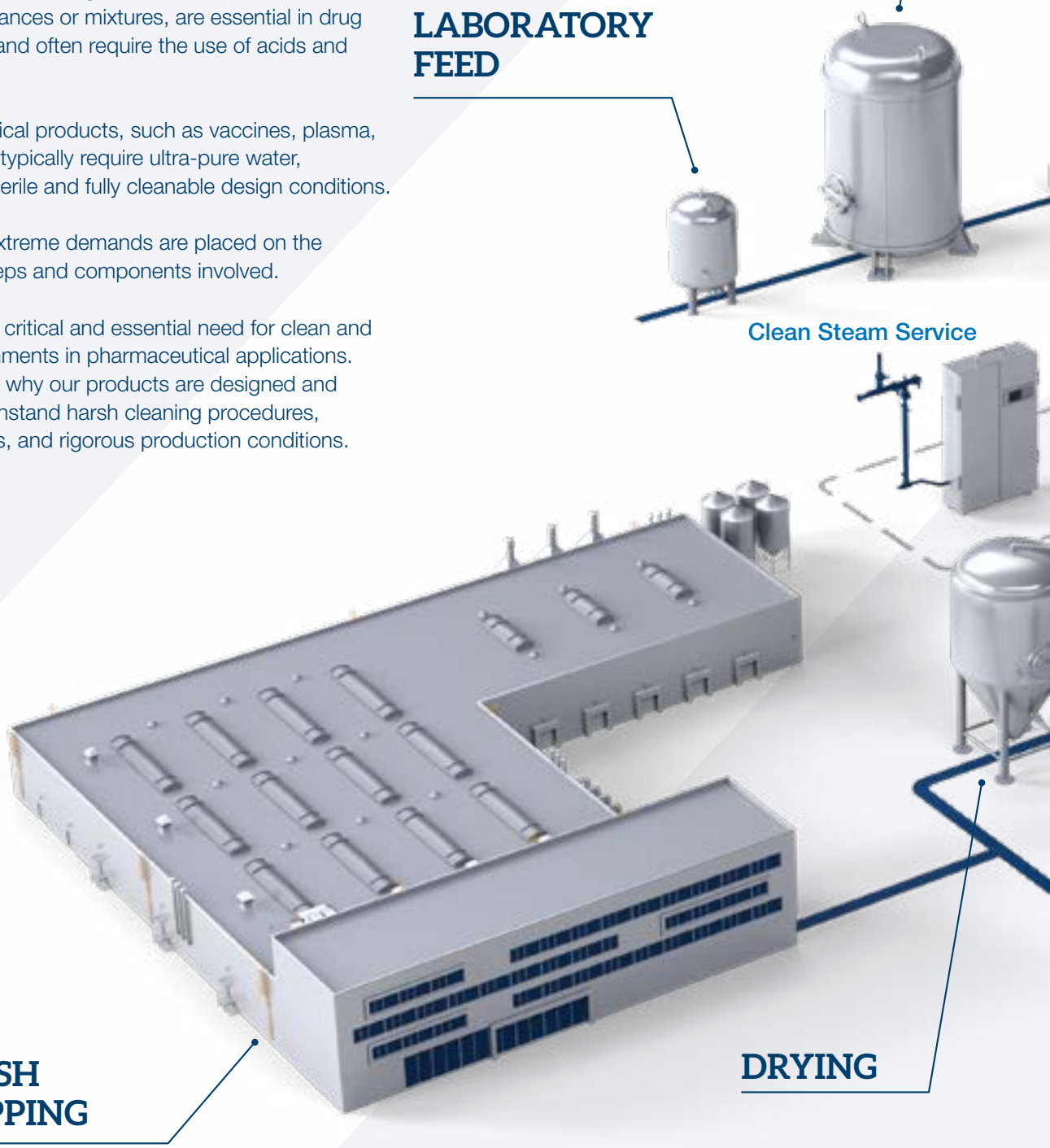
KLINGER Denmark, together with our own supply chains and our key partners like Saunders® and LABOM, provides the pharmaceutical industry with products that meet all the requirements of the industry, such as aseptic design preventing any contaminations, optimizing the yield of the value ingredients, minimizing the product loss by proven records for long time in-between maintenance.

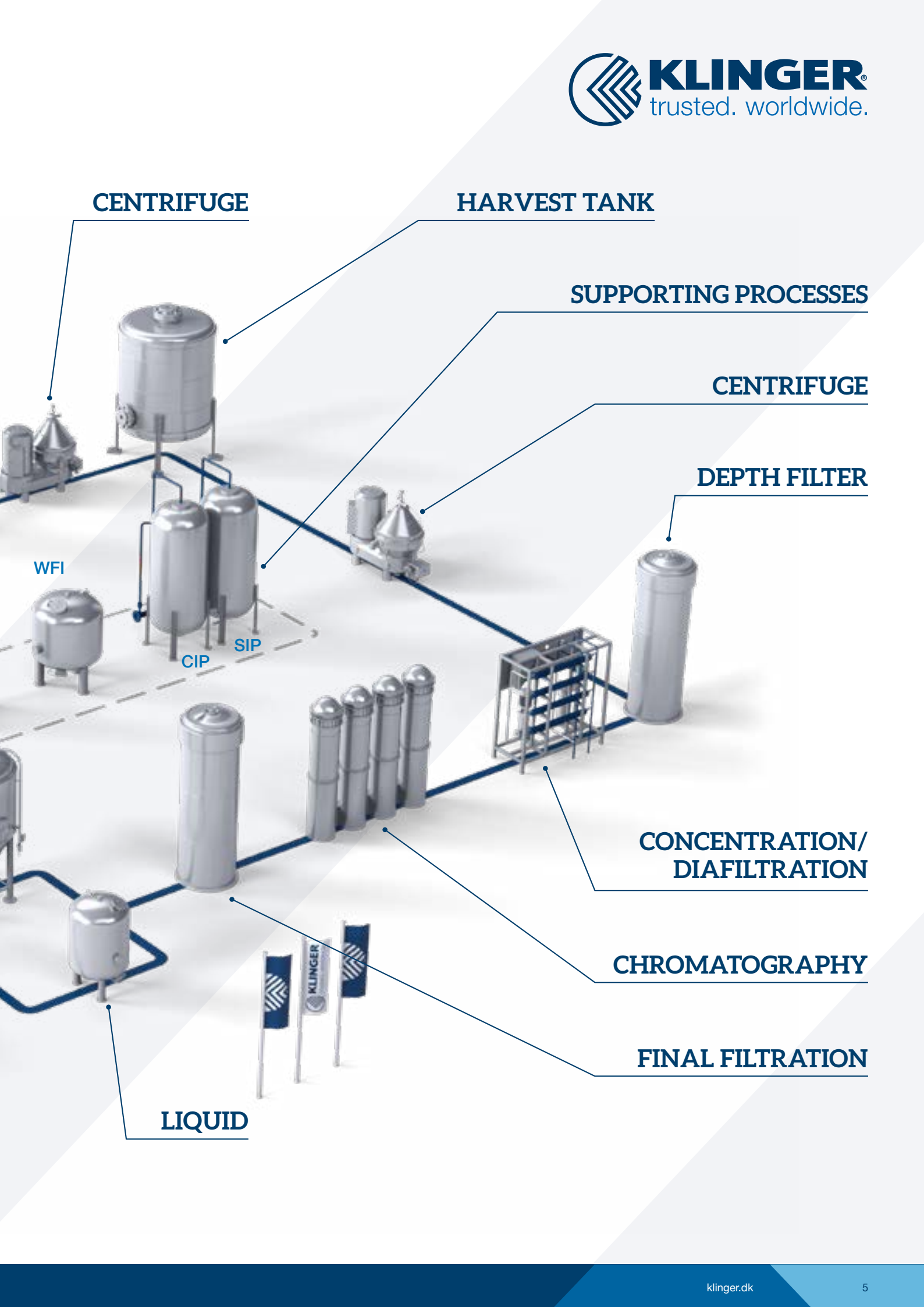
» Active Pharmaceutical Ingredients (APIs), whether as individual substances or mixtures, are essential in drug manufacturing and often require the use of acids and solvents.

» BioPharmaceutical products, such as vaccines, plasma, and injectables typically require ultra-pure water, fermentation, sterile and fully cleanable design conditions.

For both areas, extreme demands are placed on the manufacturing steps and components involved.

We recognize the critical and essential need for clean and controlled environments in pharmaceutical applications. This is the reason why our products are designed and engineered to withstand harsh cleaning procedures, high temperatures, and rigorous production conditions.




CENTRIFUGE
HARVEST TANK
SUPPORTING PROCESSES
CENTRIFUGE
DEPTH FILTER
WFI
SIP
CIP
CONCENTRATION/
DIAFILTRATION
CHROMATOGRAPHY
FINAL FILTRATION
LIQUID

PRODUCT OVERVIEW

Product and process mapping – clinical

SEGMENTS	EQUIPMENT	MEDIA	VALVES
Clinical	**Inoculum laboratory feed** **Bioreactor/ Fermentation**	**Base for fermentation: Liquids, bacteria.**	Saunders® Aseptic diaphragm valves AFP 2-way, TBV, Bio Block. Saunders® Diaphragms ER Resilience EPDM and EX Endurance modified PTFE. Saunders® Actuators S360 and P345. Saunders® Sensors I-VUE and S-VUE.
	Centrifuge **Harvest tank** **Depth filter** **Concentration/ Diafiltration** **Chromatography** **Final Filtration** **Liquid**	**Fragmentation of media.**	Saunders® Aseptic diaphragm valves AFP 2-way, TBV, Bio Block. Saunders® Diaphragms ER Resilience EPDM and EX Endurance modified PTFE. Saunders® Actuators S360 and P345. Saunders® Sensors I-VUE and S-VUE. Ball valves. Inductive switches NBN and NCN.
	Drying	**Final raw ingredients.**	KLINGER Sanitary Butterfly Valve SBV. Ball valves. Inductive switches NBN and NCN.
	Fill, finish and shipping	**Final product.**	
Supporting processes	**CIP** **SIP**	**Cleaning fluids and steam.**	Saunders® Aseptic diaphragm valves AFP 2-way, TBV, Bio Block. Saunders® Diaphragms ER Resilience EPDM and EX Endurance modified PTFE. Saunders® Actuators S360 and P345. Saunders® Sensors I-VUE and S-VUE. Ball valves. Inductive switches NBN and NCN.
	Water for injection	**Water.**	Saunders® Aseptic diaphragm valves AFP 2-way, TBV, Bio Block. Saunders® Diaphragms ER Resilience EPDM and EX Endurance modified PTFE. Saunders® Actuators S360 and P345. Saunders® Sensors I-VUE and S-VUE.
	Clean steam	**Steam.**	Saunders® Aseptic diaphragm valves AFP 2-way, TBV, Bio Block. Saunders® Diaphragms ER Resilience EPDM and EX Endurance modified PTFE. Saunders® Actuators S360 and P345. Saunders® Sensors I-VUE and S-VUE. Armstrong Clean Steam Surveyer QM®-3.

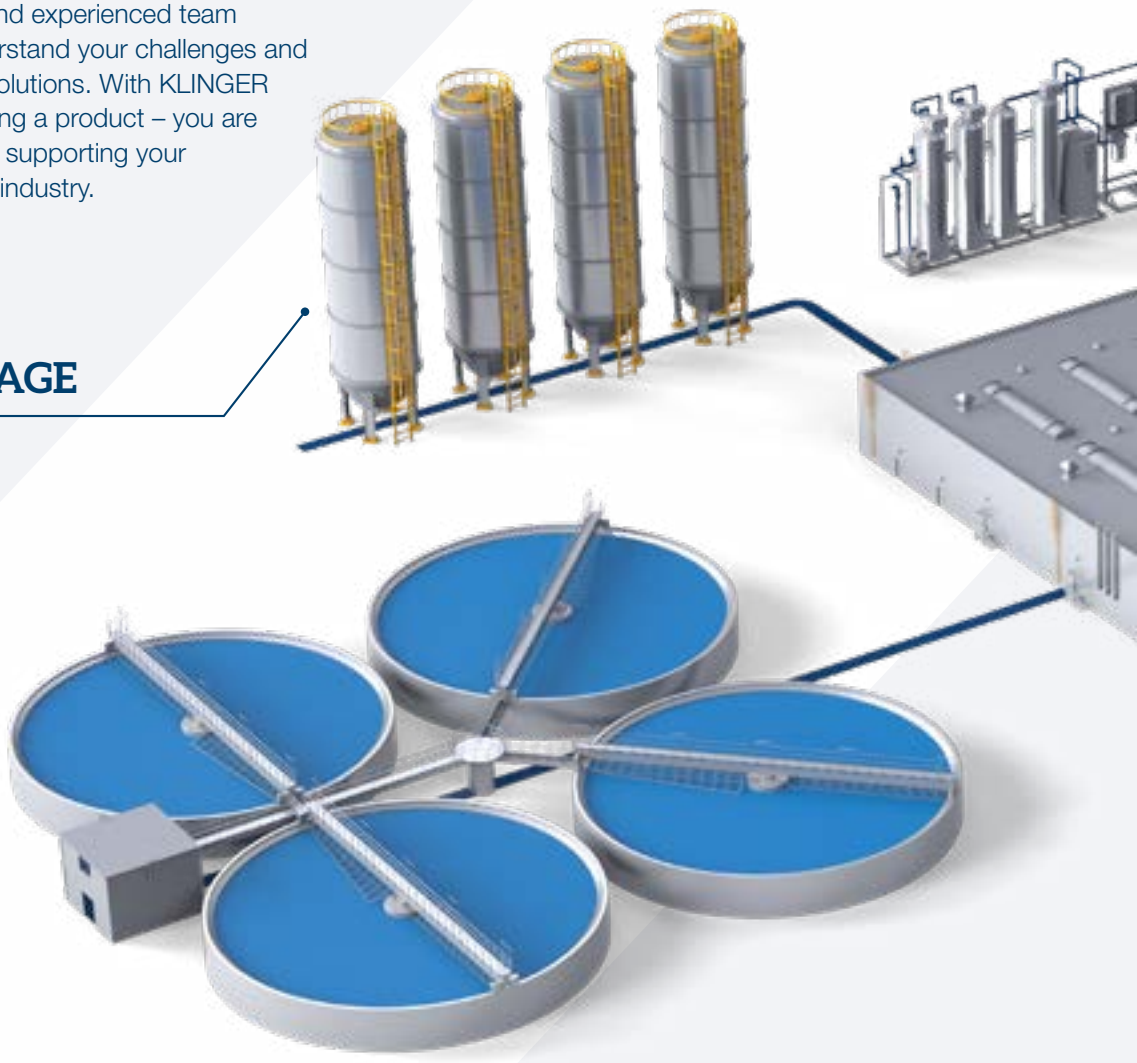
GASKETS	INSTRUMENTATION	EXPANSION JOINTS & HOSES
KLINGER® Top-Chem 2000, 2003, 2005 and 2006. KLINGER® Soft-Chem and Quantum. EPDM Rubber sheet, white. NBR Rubber sheet, white. Viton Rubber sheet FPM/FKM.	Labom BH8100/BH8200, CV4110, GA2730, GA2610, GA3110, HP1110, MZ2300, MK1000.	KLINGER metal hoses with a PTFE core.
KLINGER® Top-Chem 2000, 2003, 2005 and 2006. KLINGER® Soft-Chem and Quantum. EPDM Rubber sheet, white. NBR Rubber sheet, white. Viton Rubber sheet FPM/FKM, white.	Labom BH8100/BH8200, CV4110, GA2730, GA2610, GA3110, HP1110, MZ2300, MK1000. KLINGER Magnetic Flowmeter and Ultrasonic Flowmeter.	KLINGER metal hoses with a PTFE core.
	Labom BH8100/BH8200, CV4110, GA2730, GA2610, GA3110, HP1110, MZ2300, MK1000.	KLINGER metal hoses with a PTFE core.
KLINGER® Top-Chem 2000, 2003, 2005 and 2006. KLINGER® Soft-Chem and Quantum. EPDM Rubber sheet, white. NBR Rubber sheet, white. Viton Rubber sheet FPM/FKM, white.	KLINGER GF Gear Flowmeter. Labom BH8100/BH8200, CV4110, GA2730, GA2610, GA3110, HP1110, MZ2300, MK1000.	KLINGER metal hoses with a PTFE core.
KLINGER® Top-Chem 2000, 2003, 2005 and 2006. KLINGER® Soft-Chem and Quantum. EPDM Rubber sheet, white. NBR Rubber sheet, white. Viton Rubber sheet FPM/FKM, white.	KLINGER Magnetic Flowmeter, Ultrasonic Flowmeter and Vortex Flowmeter. Labom BH8100/BH8200, CV4110, GA2730, GA2610, GA3110, HP1110, MZ2300, MK1000, BC4200.	KLINGER PTFE expansion joints. KLINGER Type SF, Type KB, Type DF. KLINGER metal hoses and metal hoses with a PTFE core.
KLINGER® Top-Chem 2000, 2003, 2005 and 2006. KLINGER® Soft-Chem and Quantum. EPDM Rubber sheet, white. NBR Rubber sheet, white. Viton Rubber sheet FPM/FKM, white.	Labom BH8100/BH8200, CV4110, GA2730, GA2610, GA3110, HP1110, MZ2300, MK1000, BC4200.	KLINGER PTFE expansion joints. KLINGER Type SF, Type KB, Type DF. KLINGER metal hoses and metal hoses with a PTFE core.
KLINGER® Top-Chem 2000, 2003, 2005 and 2006. KLINGER® Soft-Chem and Quantum. EPDM Rubber sheet, white. NBR Rubber sheet, white. Viton Rubber sheet FPM/FKM, white.		KLINGER Type SF. KLINGER metal hoses.

PLANT VIEW

Pharmaceutical processes – utility

KLINGER Denmark provides a comprehensive range of utility products, backed by years of experience as a trusted supplier of valves, gaskets, compensators, and instruments for pressure, temperature, and level measurement. Our solutions for the utility sector in pharmaceutical processes help minimize operating and maintenance costs while ensuring a very long lifespan, delivering an optimal Total Cost of Ownership (TCO).

In addition to our extensive product selection, we specialize in crafting customized solutions to meet your unique requirements. Our dedicated and experienced team works closely with you to understand your challenges and to develop the most effective solutions. With KLINGER Denmark, you are not just getting a product – you are gaining a partner committed to supporting your success in the pharmaceutical industry.



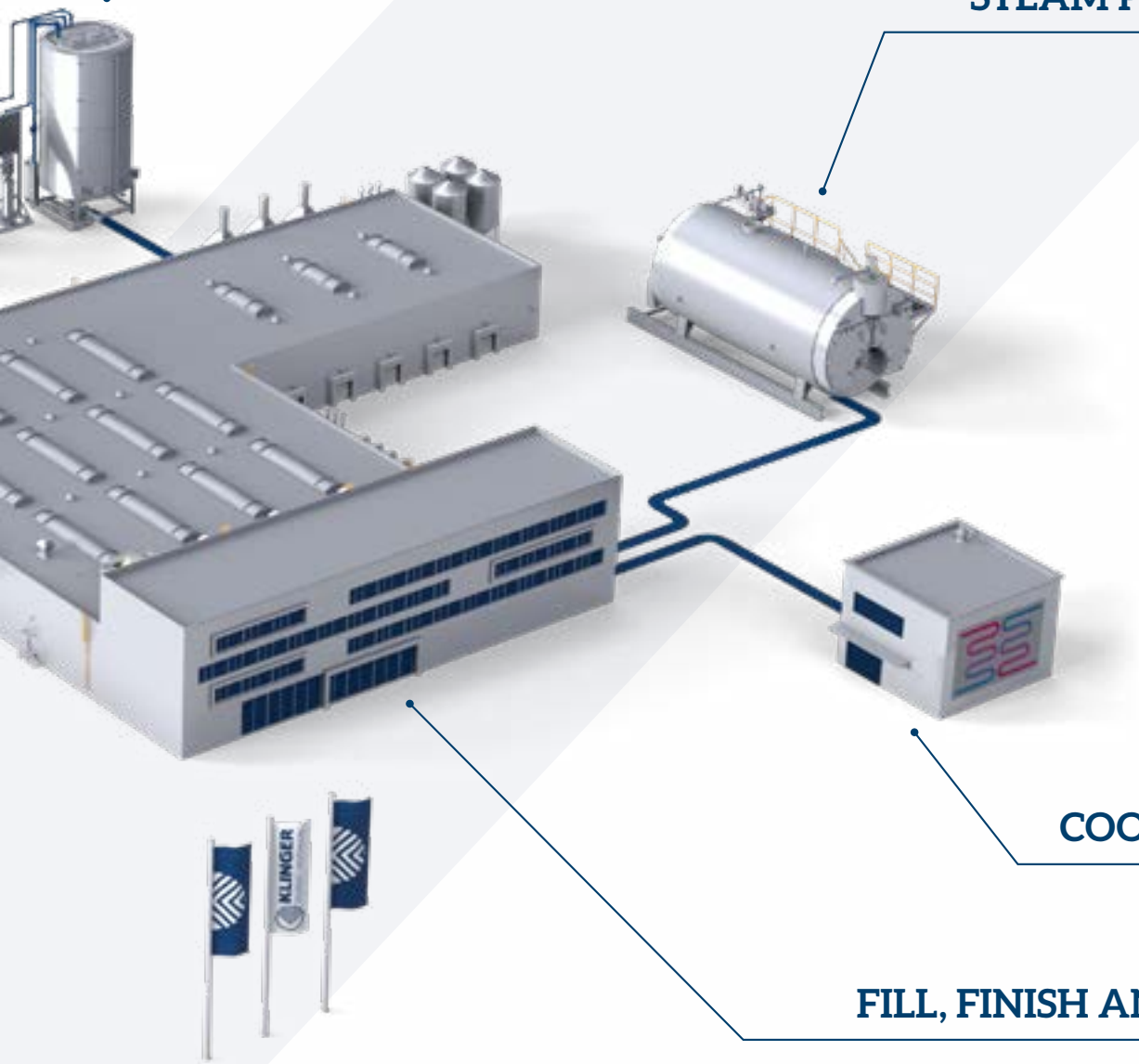
CHEMICAL STORAGE

INDUSTRIAL WASTEWATER TREATMENT

KLINGER
trusted. worldwide.

WATER PURIFICATION PLANT

STEAM PRODUCTION



CENTRAL COOLING PLANT

FILL, FINISH AND SHIPPING

PRODUCT OVERVIEW

Product and process mapping – utility

SEGMENTS	EQUIPMENT	MEDIA	VALVES
Utility	**Chemical storage**	**Acids and bases and other raw chemicals.**	Saunders® Diaphragm valves PFA lined, and rubber lined. KLINGER KHD-LB Ball Valve PFA lined. Ball valves.
	Water purification plant	**Raw water and demineralized ultra-pure water.**	Saunders® Aseptic diaphragm valve AFP 2-way. Saunders® Diaphragms ER Resilience EPDM and EX Endurance modified PTFE. Saunders® Actuators S345 and P360. Saunders® Sensors I-VUE and S-VUE. Double Check Valve. Ball valves. Inductive switches NBN and NCN.
	Steam production	**Condensate and steam.**	KLINGER KVN Piston Valve. KLINGER BALLOSTAR® KHA Ball Valve. Armstrong pressure reducing valve GP2000. Y-strainer. Check Valve 1P-NCH. Tilting Check Valve. Safety Valve – flanged and threaded. Armstrong steam trap.
	Central cooling plant	**Sea water and cooling water.**	KLINGER Butterfly Valves wafer 3530 and lugged 3533. Ball valves. Check Valve 1P-NCH. Y-strainer. Control Valve 2-ways and 3-ways. Tomoe Control Valve. KLINGER Segment Ball Valve SGF. Safety Valve – flanged and threaded. KLINGER Pneumatic Actuator AP and QTS electric.
	Industrial wastewater treatment	**Wastewater.**	KLINGER Butterfly Valves wafer 3530 and lugged 3533. Knife Gate Valve type A. KLINGER Ball Check Valve. Check Valve 1P-NCH.

GASKETS	INSTRUMENTATION	EXPANSION JOINTS & HOSES
KLINGER® KGS GII EPDM/NBR. KLINGER® Top-Chem 2000, 2003, 2005 and 2006. KLINGER® Soft-Chem.	Labom BH8100/BH8200, CV4110, GA2730, GA2610, GA3110, HP1110, MZ2300, MK1000.	KLINGER PTFE expansion joints. KLINGER Type SF, Type KB, Type DF. KLINGER metal hoses and metal hoses with a PTFE core.
KLINGER® KGS GII EPDM/NBR. KLINGER® Quantum. KLINGER® Gaja.	KLINGER Magnetic Flowmeter.	KLINGER PTFE expansion joints. KLINGER Type SF, Type KB, Type DF. KLINGER metal hoses and metal hoses with a PTFE core.
Maxiflex Graphite filled blades. KLINGERSIL® C-4430, C-4500 and C-4509. KLINGER® Graphite PSM.	KLINGER LUGB-G Vortex Flowmeter. KLINGER Transparent Level Gauge.	KLINGER Type SF and Type DF. KLINGER metal hoses.
KLINGER® KGS GII EPDM/NBR. KLINGER® Quantum.	Labom GA2730, BH8100/BH8200. KLINGER Gauge type 208. KLINGER BT Bimetal Thermometer.	KLINGER expansion joints Type T8.500 and F8.500 EPDM/NBR. KLINGER metal hoses.
KLINGER® KGS GII EPDM/NBR. KLINGER® Quantum. KLINGERSIL® C-4430.	KLINGER Magnetic Flowmeter.	KLINGER expansion joints Type T8.500 and F8.500 EPDM/NBR. KLINGER metal hoses.

SAUNDERS® ASEPTIC DIAPHRAGM VALVE

BENEFITS / PROPERTIES

Two-way valve body of forged acid-proof stainless steel by Saunders®. Zero dead leg design – self-draining design. Diaphragms for all purposes and in accordance with FDA and EN1935/2004. Application: Aseptic and sanitary installations within pharmaceutical and food industries. Wide range of manual bonnets and actuators.

SPECIFICATIONS

» Material: Forged acid-proof stainless steel - 316L (1.4435).
» Internal surface finish: Mirror finish Ra < 0.25 µm.
Satin finish Ra < 0.5 µm.
Vacublast Ra < 1.6 µm.
» External surface finish: Vacublast (glass-blown).
» Connection: Weld ends of all standards and Tri Clamps.
» Temperature: Max. 180°C.
» Pressure: Max. 16 bar for DN008-050.
Max. 10 bar for DN065-150.
Depending on diaphragm grade and actuator type (actual conditions).

SAUNDERS® ASEPTIC DIAPHRAGM VALVE, BIO BLOCK

BENEFITS / PROPERTIES

Saunders® Bio Block bodies are a unique platform of custom designs. These innovative Machined Block solutions are determined by process, space constraints, system design, piping challenges, orientation requirements or regulatory issues. We work closely with our customers to design and develop fast track menus of Bio Block solutions to meet the unique challenges of life science applications. Very suitable for the pharmaceutical industry.

SPECIFICATIONS

- Material: Forged acid-proof stainless steel - 316L (1.4435).
- Connection: Weld ends in all standards and Tri Clamps.
- Temperature: Depending on diaphragm type.
- Options: Available in AL6XN, Hastelloy, Titanium, etc. Surface available in many variations.
- Operation: Fully compatible with manual bonnets, EC, ECX, ES and S360 actuators along with the full program of diaphragms.

SAUNDERS® ASEPTIC DIAPHRAGM VALVE TBV

BENEFITS / PROPERTIES

Saunders® Aseptic diaphragm valve TBV ensures safe and sterile shut-off solutions for sensitive environments. It has no welds or dead-leg and reduces risk of contamination. Very suitable for the pharmaceutical industry. Application: WFI tanks, fermenters and bioreactors.

SPECIFICATIONS

- Material: Forged acid-proof stainless steel - 316L (1.4435).
- Dimensions: DN015-100.
- Connection: Weld ends in all standards and Tri Clamps.
- Temperature: Depending on diaphragm type.
- Options: Available in AL6XN, Hastelloy, Titanium, etc. Available with samplings and vent valve. Many variations of surface.
- Operation: Fully compatible with manual bonnets, EC, ECX,ES and S360 actuators and with the full program of diaphragms.

SAUNDERS® DIAPHRAGM VALVE, HARD RUBBER LINED

BENEFITS / PROPERTIES

Saunders® Diaphragm Valve, hard rubber lined comes with 100% seal, clearly identifiable open/shut indication and is for all purposes. Application: Brine, acid solutions (HCl) and deionized water.

SPECIFICATIONS

- Material: Cast iron w/ HRL lining.
- Pressure class: PN10/16.
- Diaphragm: Depending on fluid, grades in accordance with FDA requirements possible.
- Temperature: -10°C to 85°C.
- Pressure: 16 bar DN15-50. 10 bar DN65-150. DN150 7 bar w/ PTFE diaphragm.
- Face to face: EN558-1, Series 1 or 7 (BS5156).
- Connection: Flanged BS EN1092 PN 10/16.
- Options: Pneumatic or electric actuator. DIN face to face.

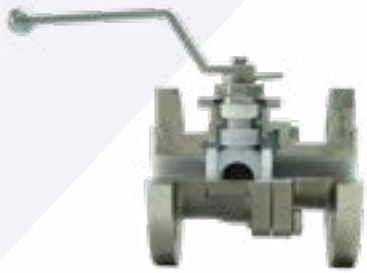
SAUNDERS® DIAPHRAGM VALVE, PFA LINED

BENEFITS / PROPERTIES

Saunders® PFA lined Valve demonstrates the highest chemical resistance of all Saunders® linings and is ideal for high purity applications. Saunders® Diaphragm Valve, PFA lined has 100% seal, clearly identifiable open/shut indication and is a diaphragm for all purposes. Applications: Strong acids, alkalis and salts.

SPECIFICATIONS

- Material: Ductile cast iron w/ PFA lining.
- Pressure class: PN10/16.
- Bonnet: Cast iron.
- Hand wheel: Cast iron / Steel.
- Diaphragm: PTFE/EPDM, PTFE/Butyl, PTFE /FKM.
- Temperature: -10°C to 175°C (depending on diaphragm).
- Pressure: 16 bar DN15-50. 10 bar DN65-150.
- Face to face: EN558-1, Series 1 or 7 (BS5156).
- Connection: Flanged BS EN1092 PN 10/16.



KLINGER KHD-LB BALL VALVE, PFA LINED

BENEFITS / PROPERTIES

KLINGER KHD-LB Ball Valve with PFA lining is suitable for high corrosive media such as sulfuric acid, hydrochloric acid, caustics, pharmaceutical applications. With these features, lined ball valves exhibit replacement to special-alloy valves in high corrosive applications. They are ideal for applications where chemical compatibility is important and where the tightest possible seal is essential.

SPECIFICATIONS

- Material: Steel or stainless steel w/ PFA lining.
- PFA in accordance with FDA requirements.
- Temperature: -20°C to 200°C.
- Dimensions: DN15 - DN 200.
- Pressure: PN16, options ANSI 150/300 lbs.
- Connection: Flanges EN1092.
- Face to face: EN558-1 series 1.

BALL VALVES

BENEFITS / PROPERTIES

Ball Valves offer in-line maintenance possibility, where combination of end connections offers great flexibility. This three-piece ball valve is composed of 3 separate pieces held together by bolts. A three-piece ball valve is preferred whenever regular cleaning is required. The ball valve ends can remain in the pipe, while the center section can be removed.

SPECIFICATIONS

- Material: Acid resistant stainless steel 1.4408/1.4404 (316/316L).
- Pressure class: PN63 (DN8-50), PN40 (DN65-100).
- Ball: Acid resistant stainless steel 1.4408 (316).
- Stem: Acid resistant stainless steel AISI 316.
- Seats: PTFE according to FDA CFR21§177.1550 and EC 1935-2004.
- Temperature: -30°C to 180°C. 3" - 4": -20°C to 180°C.

KLINGER SEGMENT BALL VALVE, SGF

BENEFITS / PROPERTIES

KLINGER Segment Ball Valve SGF is suitable for flow and pressure control. Wide control range 150:1and easy mounting of actuators due to ISO5211 flange. No build-up of material and impurities. Applications water, fluids, oil, and pulp.

SPECIFICATIONS

- Material: WCB steel / Acid resistant stainless steel CF8M (316).
- Pressure class: PN10, PN16 and 150lbs.
- Segment ball: Stainless steel CF8 (304) + Cr or Acid-resistant stainless steel CF8M (316).
- Stem / Bushing: Stainless steel 17-4PH/ Self lubricated PTFE/316-PTFE/304.
- Connection: Flanges acc. EN1092 / ANSI 16.5.
- Temperature: -29° to 180°C (+400°C metallic seat).
- Actuation: Elektric or pneumatic actuator.

KLINGER BALLOSTAR® KHA BALL VALVE

BENEFITS / PROPERTIES

KLINGER BALLOSTAR® KHA Ball Valve – the multi-talented product for many applications. A wide range of types due to the modular construction system characterizes these 3-piece ball valves. Three kinds of connections, six types of sealing elements and three stuffing box design ensure that KLINGER Ballostar® KHA ball valves are suitable for many different operating conditions. Fire-safe versions and V-port balls for control use available.

SPECIFICATIONS

- Material: Type VIII (M1): Steel 1.0619 Type XC (M2): Acid-resistant stainless steel: 1.4408 (AISI316).
- Pressure class: PN40 or PN16.
- Ball: Acid-resistant stainless steel 1.4571 (AISI316Ti).
- Spindle: Acid-resistant stainless steel, Anti-static.
- Seat element: Standard KFC (PTFE + 25% graphite) retained in stainless resilient element.
- Spindle gasket: Standard Labyrinth (PTFE/SS316).
- Connection: Flanges, threaded or butt weld ends.
- Temperature: -20°C to 300°C VIII (M1).
  -60°C to 300°C XC M2) +400°C w/ metal seats.

KLINGER BALL CHECK VALVE

BENEFITS / PROPERTIES

KLINGER Ball Check Valve offers horizontal or vertical mounting with upward flow direction, Full bore execution gives low pressure loss, has self-cleaning ball and has low noise level. Applications: Water and other liquids.

SPECIFICATIONS

- Material: Cast iron ≤ DN80.
- Ductile cast iron: ≥ DN100.
- Pressure class: PN10.
- Ball: Phenolic Resin ≤ DN80.
  Aluminum + elastomer (NBR) ≤ DN250.
  Cast iron + elastomer (NBR) ≥ DN300.
- Body sealing: Nitrile rubber (NBR).
- Seat: Nitrile rubber (NBR).
- Leakage rate: acc. ISO 5208.
- Counter-pressure: 0,3-0,5 bar for density.
- Temperature: 10°C to 70°C.
  Special balls for liquids with density differing from water. Viton sealing cap.
- Connection: Flanged EN1092.

TILTING CHECK VALVE

BENEFITS / PROPERTIES

Check Valve with a wafer tilting disc designed to close due to the weight of the disc without requiring spring or backpressure. Its tilting disc design enables exceptionally low opening pressure and allows full disc opening at a lower flow rate compared to other check valve types. Also available with damper/weight arm.

SPECIFICATIONS

- Dimensions: DN50-600 (max. PN64).
  DN700-1200 (max. PN25).
- Materials: Steel, acid resistant stainless steel, duplex, super duplex.
- Pressure class: PN10, 16, 25, 40 and 64, optional ANSI 150 lbs / PN6.
- Used for water, steam, oil and other fluids.
- For horizontal or vertical installation with upwards flow direction.

CHECK VALVE 1P-NCH

BENEFITS / PROPERTIES

Check Valve 1P-NCH comes in single and dual disc types. It is a spring load check valve in stainless steel. Universal mounting and can be used as a vacuum circuit breaker with very little pressure loss and low opening pressure. For flanges acc. to PN 6/10/16/25/40.

SPECIFICATIONS

- Type: 1P-NCH.
- Material: AISI 316.
- Pressure class: PN40.
- Disc, seat and spring: Stainless steel AISI 316.
- Face to face: EN558 series 49.
- Temperature: 140°C at 40 bar.
  260°C at 30 bar.
  400°C at 20 bar.

DOUBLE CHECK VALVE

BENEFITS / PROPERTIES

Check Valve is an effective backflow preventer and protects against pollution of drinking water. "Block and bleed" system, i.e., pressureless open chamber between the two non-return valves, if pressure vanishes. Application: water.

SPECIFICATIONS

- Type: Backflow preventer.
- Material: Cast iron, epoxy coated.
- Pressure class: PN10.
- Valve seats and disc inlet: DN65-100: Noryl (PPO); DN150: RG5.
- Drain valve: Noryl (PPO) outlet to be applied to drain.
- Temperature: 10°C to 65°C.
- Connection: Flanged EN1092 or threads.

KLINGER SANITARY BUTTERFLY VALVE SBV

BENEFITS / PROPERTIES

KLINGER Sanitary Butterfly Valve, SBV is suitable for the pharmaceutical industry with on/off in process pipes or for rough regulation. The sanitary butterfly valve SBV meets the requirements of the industry and is available with several operating options and with several connections. Furthermore, it is a compact and robust design.

SPECIFICATIONS

- Material: Stainless steel ASTM T304/T316L, 1.4301/1.4404.
- Size: ½" - 12", DN10 to DN300.
- Temperature: -10° to 130°C.
- Pressure class: Max. 10 bar.
- Liner: EPDM, FPM, HNBR.
- Connection: Weld (BW), Thread (TH), Clamp (C).
- Operation: Manual, pneumatic or electric.
- Approvals: DA according to 177.2600, 3-A hygienic design.

KLINGER BUTTERFLY VALVE WAFER

BENEFITS / PROPERTIES

Wafer w/ centering holes for PN10/16. Application: Liquids, gases or powdered media (depending on seat type). Double O-ring seal in stem, bottom bearing in bronze, bushing and top bearing in Delrin ensure long life. Short face to face and low weight. Exchangeable seat. Actuator flange ISO 5211 for easy mounting of pneumatic or electric actuator.

SPECIFICATIONS

- Material: Cast iron, ductile iron or acid resistent stainless steel bodies. (Not wetted part).
  Disc: Ductile, acid resistent stainless steel, bronze, and special grades like Hastelloy.
- Seat type: EPDM/EPT, NBR, Viton, silicone, and white EPDM acc. to FDA and EC1935.
- Pressure class: PN10 / PN16, 150 lbs JIS 5K/10K PN10 for dimension ≥ DN600.
- Temperature: -20°C to 140°C depending on seat material.

KLINGER BUTTERFLY VALVE LUGGED

BENEFITS / PROPERTIES

Application: Liquids, gases and powdery media (depending on seat type) Lugged type can be clamped on the end flange and ensures 100% centering and shut off. Double O-ring seal in the spindle, as well as the bottom bearing in the bronze bushing and the top bearing. Mounting flange ISO 5211 for easy mounting of pneumatic or electric actuator.

SPECIFICATIONS

- Material: Ductile iron or acid resistent stainless steel bodies. (Not wetted part).
  Disc: Ductile, acid resistent stainless steel, bronze, and special grades like Hastelloy.
- Seat type: EPDM/EPT, NBR, Viton, silicone, and white EPDM acc. to FDA and EC1935.
- Pressure class: PN10 / PN16, 150 lbs JIS 5K/10K PN10 for dimension ≥ DN600.
- Temperature: -20°C to 140°C depending on seat material.

TOMOE CONTROL VALVE 508V

BENEFITS / PROPERTIES

Tomoe Control Valve wafer type is for control of water, water/glycol, liquids and gases. Compact installation dimensions and low weight. Control Ratio 100:1. 100% tight shut-off – cosine-shaped seat with metal core. Documentation through advanced calculation program. Options (disc).

SPECIFICATIONS

- Material: Ductile cast iron (JIS FCD450), no media contact.
- Pressure class: PN10 / PN16.
- Dimensions: DN80 to DN600.
- Disc: DN80-200 stainless teel 316 (JIS SCS14) >DN200 stainless steel 304 (JIS SCS13).
- Stem: 316 stainless steel (SUS420J2 / SUS392J1).
- Seat: EPDM vulcanized on metal core.
- Max. work pressure: DN80-200: 16 bar.
  DN250-600: 10 bar.
- Temperature: EPDM: -10°C to 120°C.

CONTROL VALVE 2-WAYS AND 3-WAYS

BENEFITS / PROPERTIES

Globe Control Valves are often equipped with pneumatic or hydraulic actuators due to the fast response compared to electric actuators. The most used globe control valves are designed as single stage valves, but the sophisticated multi-stage control valves offer more accurate reductions without increasing cavitation and noise.

SPECIFICATIONS

- Valve function: 2- and 3-way.
- Housing material: Cast iron or stainless steel.
- Seat: NBR, EPDM or PTFE.
- Connection: Flange EN 1092-1.
- Temperature: Medium from -30ºC to 350ºC.
- Possible operation with Oxygen.
- Pressure ranges: PN15-25-40.

ARMSTRONG PRESSURE REDUCING VALVE GP2000

BENEFITS / PROPERTIES

The GP-2000 is a high-performance, externally piloted reducing valve for steam service with large-capacity requirements. With a 20:1 rangeability and high Cv. GP-2000 is reliable and accurate over a long, trouble-free service life. It is single-seated for dead-end service.

SPECIFICATIONS

- Material: Ductile iron.
- Connection: Flanges to EN1092 or ANSI, Female threads to BSPT or NPT.
- Max. inlet: 20 bar.
- Outlet 1-14 bar, option 0,2-1,5 bar or 0,07-0,2 bar
- Rangeability: 20:1.
- Temperature: Max. 230°C.

KLINGER KVN PISTON VALVE

BENEFITS / PROPERTIES

KLINGER KVN series piston valve with hand wheel for flow media 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 for example globe valves. Valve connection with welding ends, threads and flanges.

SPECIFICATIONS

- Material: Cast iron, cast steel and stainless steel.
- Pressure class: PN16, 40, 63.
- Hand wheel: Steel.
- Stem: Stainless steel.
- Piston: Stainless steel.
- Valve rings: KLINGER KX module.
- Temperature: -10°C to 427°C depending on pressure.

Y-STRAINERS

BENEFITS / PROPERTIES

Y-Strainers are devices for mechanically removing unwanted solids from liquid, gas or steam lines by means of a perforated or wire mesh straining element. They are used in pipelines to protect pumps, meters, control valves, steam traps, regulators and other process equipment. Application: Water, fluids, oil and gas.

SPECIFICATIONS

- Material: Cast iron, ductile iron, acid reistent stainless steel.
- Pressure class: PN16, PN25, PN 40, PN10 on request.
- Drain plug in cap.
- Filter: Stainless steel.
- Mesh size: (standard) - 1.0 mm ≤ DN50, - 1.25 mm DN65-80, - 1.6 mm DN100-200.
- Options: Other mesh sizes.

KNIFE GATE VALVE, TYPE A

BENEFITS / PROPERTIES

Knife Gate Valve, type A is suitable for applications such as wastewater and slurry. It has a very short face to face, long life and is uni-directional. Knife Gate Valves for bidirectional flow are in product line as well as square form types.

SPECIFICATIONS

- Material: Cast iron and stainless steel AISI316.
- Working pressure: PN10
- Gate: Stainless steel AISI 316.
- Seat: EPDM, NBR, Viton, silicone, also FDA versions.
- Stem: Stainless steel AISI 303.
- Hand wheel: Cast iron.
- Gasket: Standard synthetic PTFE/EPDM.
- Temperature: -10°C to 120°C.

SAFETY VALVE, FLANGED AND THREADED

BENEFITS / PROPERTIES

Safety Valve flanged and threaded is for steam, liquids, water and non-aggressive gases. Normal lift type and Full lift type with large capacity. Design/dimensions EN12516-1, EN4126-1/7. Inspection: EN4126-1/7, API 527, MSS SP-55 and tolerances: EN4126-1 and ASME UG-126.

SPECIFICATIONS

- Material: Steel, stainless steel and special alloys.
- Pressure class: PN16, 25, 40, 63, 100 and 400.
- Seat: Metal or soft seated (also to FDA requirements).
- Bonnet: Closed with or without lever.
- Connection: Flanged EN1092 or ANSI, threaded BSP or NPT, Tri-Clamps for hygiene.
- Temperature: Max. 350°C.

SAUNDERS® ACTUATOR S360

BENEFITS / PROPERTIES

The Saunders® Piston Actuator S360 permits remote operation of the valve, either as an alternative to manual operation or as an integral part of a control system. The S360 is a compact, lightweight, piston-type pneumatic actuator which has been developed to deliver superior performance for sterile Bio-pharm applications.

SPECIFICATIONS

» Material: Polished 316 stainless steel.
» Sizes: DN015-50.
» Air connection: 1/8" BSP, stainless steel.
» Operating air: Operated using compressor air.
» Operating pressure: Max. 6 bar.
» Temperature: 0° to 100°C (autoclave max. 150°C).
» Options: Spring open and double acting.

SAUNDERS® ACTUATOR P345

BENEFITS / PROPERTIES

Saunders® pneumatic actuator P345, designed to reduce operating pressure requirements to 4.5 bar, which in turn can reduce your carbon footprint and energy cost by 11%. The lightweight piston type pneumatic actuator has been developed to deliver sustainable performance for pharmaceutical industry.

SPECIFICATIONS

» Material actuator housing: Polymide.
» Material bonnet: Stainless steel.
» Size range: DN8 (0.25") – DN50 (2.00").
» Closure performance:
Elastomer Diaphragm – 10 bar (145 PSI®).
PTFE Diaphragm – 8 bar (116 PSI®).
» Temperature range: -10°C to 100°C.

KLINGER PNEUMATIC ACTUATOR AP

BENEFITS / PROPERTIES

KLINGER Pneumatic Actuator, AP offers easy mounting of solenoid valve, limit switches / proximity switches, positioner and other accessories. All connections are standardized. Very strong and corrosion resistant surface with adjustable stroke length and fine polished inner cylinder surface (Ra o,4-0,6) for minimal friction provide extended lifetime. 100% function and leakage tested. Min. 1.000.000 operations guaranteed.

SPECIFICATIONS

- Material: Anodized aluminum or stainless steel (316).
- Shaft: Nickel-plated carbon steel (ENP) or stainless steel (316).
- Covers: Polyester painted aluminum or stainless steel (316).
- Control media: Dry or lubricated filtered air, inert gas, light hydraulic oil.
- Supply pressure: 1 to 10 bar. 6 bar for full spring package.
- Temperature: -20°C to 80°C, optional +150°C and minus 40°C.
- Actuator flange: ISO 5211.
- Version with adjustable end stop type RE.

KLINGER ELECTRIC ACTUATOR QTS

BENEFITS / PROPERTIES

KLINGER Electric Actuator QTS has quarter turn with mounting flange according to ISO 5211, visual position indicator, robust powder-coated aluminum body, CE, CSA and RoHS and self-locked gear in high alloy steel. Suitable for following applications: ball valves, butterfly valves, plug valves and 3-way valves.

SPECIFICATIONS

- Material: Powder-coated aluminum.
- Voltage: 24/110/230VAC 50/60Hz, 3x400VAC 50/60Hz or 24VDC.
- Enclosure rating: IP67. NEMA4X.
- Operating Mode: VDEO530 S2 (30% on/off) / S4 (50% control).
- Mechanical stop: 2 pcs. + 2 pcs. volt adjustable.
- Emergency hand wheel: Standard.
- Motor protection: Standard thermocouple.
- Ambient temperature: -30°C to 65°C (w/ heater).

SAUNDERS®
EX ENDURANCE DIAPHRAGM

The Saunders® EX Endurance Diaphragm has a unique material combination and delivers exceptional performance. The diaphragm is designed to last at least three times longer than traditional PTFE/EPDM diaphragms, enhancing production efficiency and minimizing downtime.

Upgrade your existing operations with Saunders® EX Endurance Diaphragm, engineered for exceptional durability and sustainability. Its universal compatibility allows seamless integration with your existing diaphragm bodies and weirs, regardless of the manufacturer, making it a versatile and cost-effective solution.

In addition, this diaphragm supports a more sustainable and environmentally friendly approach to pharmaceutical processes by dramatically decreasing plastic waste.

SAUNDERS® EX ENDURANCE DIAPHRAGM

BENEFITS / PROPERTIES

Saunders® EX Endurance Diaphragm performs exceptionally well in applications exposed to prolonged sterilization regimes or higher temperatures up to 175°C. Ideal for steam supply, steam distribution, sterile barriers, steam condensate and block-and-bleed applications. The diaphragm is a two-part membrane consisting of a modified PTFE front (TFM) and a reinforced silicone support membrane.

SPECIFICATIONS

- Dimensions: DN008 to DN100 (0.25"- 4").
- Construction: Modified PTFE (TFM) backing silicone.
- Maximum constant temperature: 175°C.
- Maximum periodic temperature: 175°C.
- Minimum temperature: -20°C.
- Approvals: FDA 21CFR Part 177. USP class VL <87>, <88> (3rd party test). ASME BPE part SG. Certified Animal Derived Component Free (ADCF). Full traceability in terms of EN 10204 1.3.

SAUNDERS® ER RESILIENCE EPDM DIAPHRAGM

BENEFITS / PROPERTIES

Improved surface roughness to ensure the purity of the process (ASME BPE). Up to 40% better back suspension compared to typical EPDM diaphragm reduces the need for tension and ensures better sealing. Excellent resistance to typical bio-pharm process media. Very suitable for the bioprocess industry such as buffers, CIP, SIP, protein solutions and other products. Saunders ER diaphragm is produced by a special EPDM connection.

SPECIFICATIONS

- Material: Organic peroxide cured.
- Dimensions: DN008 to DN150 (0,25" - 6").
- Temperature, fluid media: 40°C to 110°C.
- Temperature, steam sterilization: Max. 150°C (max. 180 minutes per cycle).
- Approvals: FDA 21CFR del 177.2600. USP class VL <87>, <88> (3. part testet). ASME BPE del SG. Certified ADCF (Animal Derived Component Free). Full traceability acc. to EN 10204 1.3.

INDUCTIVE SWITCH NCN3-F25-N4-V1

BENEFITS / PROPERTIES

Namur limit switch. Limit switch indication for automatic and manual shut-off valves with a 90° rotation. Compact design and robust and mechanically strong solution. Direct and simple mounting on the actuator (NAMUR VDI/VDE 3845). Angular and straight plug with clear visual yellow position indicator on the puck.

SPECIFICATIONS

- Material: PBT thermoplastic.
- Protection degree: IP67.
- Double Namur Sensor, 2 wire.
- Assured operating distance: 0,1 to 2,43 mm.
- Connection: For connector M12 x 1 (4-pole).
- Operating voltage: 8V.
- Operating current: 1mA.
- Operating temperature: -25°C to 100°C.
- Switching state: LED, yellow.
- ATEX: 1G, 2G, 3G, 3D.
- Safe area: Model NBN3-F25-E8-V1.

SAUNDERS® I-VUE SENSOR

BENEFITS / PROPERTIES

Compact sensor technology designed for pharmaceutical plant. Direct mounting on S360. High reliability and accuracy of less than 0,2 mm. Simple installation; automatic calibration in less than 3 minutes. Monitoring valve cycle counts and end point tolerance limits. Low maintenance costs.

SPECIFICATIONS

- Material: Polycarbonate w/ stainless steel connection. IP67 and NEMA 4X ensclosure.
- Dimensions: DN008 - 100.
- Temperature: 0°C to 70°C.
- Sensor technology: 5 electromagnetic coils.
- Accuracy: <0,2mm DN008-100.
- Positions indication: Green LED lights for open. Red LED light for closed. Yellow visual position indicator on top.
- Feedback: 24V DC point-to-point. AS-i (2.0, 2.1 and 3.0). DeviceNet.
- Programming: Magnetic key or control panel.

SAUNDERS® S-VUE PRO INTELLIGENT SENSOR

BENEFITS / PROPERTIES

Enhanced version of I-VUE, but a valve monitor with additional intelligent functionality. Fully configured using Bluetooth or magnetic buttons and with no external mechanical keys that can break and no internal adjustments that require dismantling the casing. The automatic calibration feature, without opening the enclosure, reduces the time it takes to set up the monitor.

SPECIFICATIONS

- Body material: Aluminum, Stainless steel.
- Tightness class: IP-67.
- Communication: IO-Link, ASi (A5, A32), DeviceNet, and ProfiNet Network.
- ATEX: Zone 1 and 2 approved.
- Sensor technology: 5 electromagnetic coils.
- Dimensions: DN008 - 100.
- Positions indication: Digital display + LED red/green/yellow indicators.
- Smart configuration:
  Via Bluetooth: Settings, calibration, display alarms.
  Magnetic key: Settings, Calibration.

ARMSTRONG STEAM TRAP

BENEFITS / PROPERTIES

A Steam Trap is part of the process of removing condensate water from the steam system. The functional principle of the steam trap is either mechanical, thermostatic, or thermodynamic. We can supply all types and also other equipment such as condensate pumps, steam trap stations, and sanitary traps. Armstrong inverted traps have the longest lifetime of all traps. We can assist you in sizing the traps.

SPECIFICATIONS

- Materials: Cast iron, Ductile iron, Stainless steel, Steel.
- Connections: Flanges EN1092/ANSI, Threaded to BSPT/NPT, Socket weld.
- Size: DN15 - 80.
- Capacity: up to 94.000 kg/h.
- Pressure: up to 102 bar.

ARMSTRONG CLEAN STEAM SURVEYER

BENEFITS / PROPERTIES

Steam QM®-3 is an intelligent solution that allows pharmaceutical manufacturers, hospitals, and other healthcare facilities concerned with steam quality to easily and efficiently measure the quality of steam used for sterile applications. Steam QM®-3 has an automatic steam quality monitor that determines and communicates steam moisture content, the amount of superheat present, and the concentration of non-condensable gases in steam.

SPECIFICATIONS

- Clean steam norm: EN-285.
- Dryness fraction: 85-100%.
- Amount of superheat present: 0°C to 70°C.
- Voltage: 115 and 230 VAC ±10%.
- NCG content: 0-15%.
- Steam operating pressure range: 7 - 60 psig (1/2 - 4 barg).

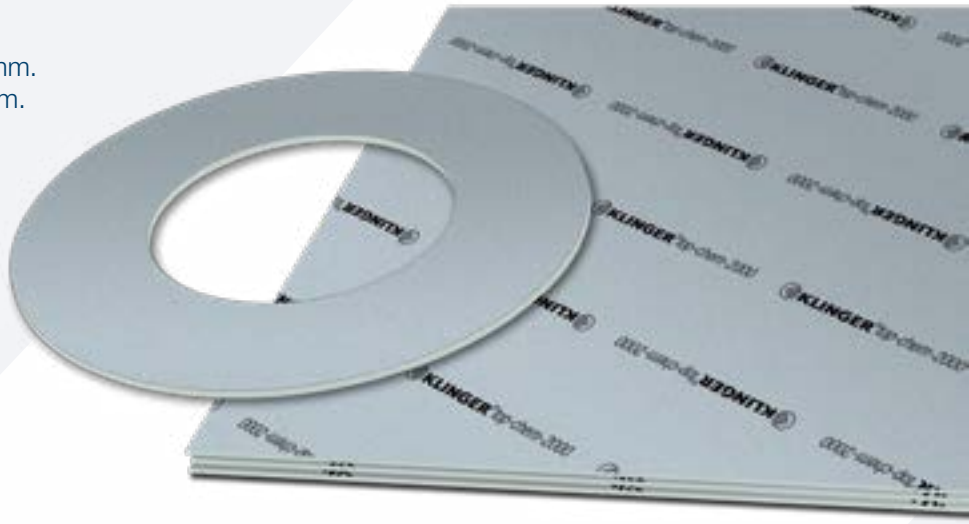
KLINGER® TOP-CHEM 2000

BENEFITS / PROPERTIES

The perfect universal gasket for heavy-duty applications. Manage high temperatures in combination with high pressure up to 260°C. The only PTFE gasket with a fire-safe certificate API 6FA. Excellent for all types of aggressive media. FDA conformity for Food & Pharma. Retained resilience = retorque is not necessary. No aging. No cold flow. Extremely gas tight.

SPECIFICATIONS

» Modified PTFE.
» Sheet size: 1500 x 1500 mm.
» Thickness: 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm.
» Tolerances: Length ± 50 mm, width ± 50 mm.
» Can be supplied as rings in DIN, ANSI, and customized dimensions.
» Approvals: DIN-DVGW, DVGW H2-ready (ZP 5123), DIN 16421 (W 270), KTW-BWGL, WRAS, TA-Luft (Clean air), Fire-safe acc. to DIN EN ISO 10497, FDA compliant (PTFE), Regulation (EU) No. 1935/2004 (incl.10/2011), DNV, VDI 2200 blowout.



KLINGER® TOP-CHEM 2003

BENEFITS / PROPERTIES

Suitable for low temperature and large sealing surfaces. Excellent for all type of aggressive media. FDA conformity for Food & Pharma. Retained resilience = retorque is not necessary. No aging. Excellent adaption to bad flange surfaces. High gas tightness at low torque.

SPECIFICATIONS

» Modified PTFE.
» Sheet size: 1500 x 1500 mm.
» Thickness: 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm.
» Tolerances: Length ± 50 mm, Width ± 50 mm.
» Can be supplied as rings in DIN, ANSI, and customized dimensions.
» Approvals: BAM, DIN-DVGW, DIN-DVGW W 270, DNV GL, TA-Luft, KTW + FDA, EU 1935/2004.

KLINGER® SOFT-CHEM EXPANDED PTFE

BENEFITS / PROPERTIES

KLINGER® Soft-Chem expanded PTFE is virtually all media or where there is little bolt force. High compressibility. Chemical resistance as ePTFE. Supplied in sheets as well as die-cut gaskets on request. Delivery on rolls.

SPECIFICATIONS

» Type: Expanded PTFE.
» Color: White, both sides.
» Compressibility ASTM F36A: 60%.
» Springback ASTM F36A: 12%.
» Pressure stability ASTM F38B (1.5 mm): 35% (100°C).
» Density DIN 28090: <0.01 mg/SXM.
» Density: 0.85g/cm^3.
» Approvals: FDA, TA-Luft.

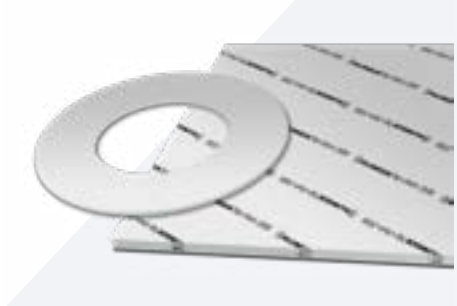
KLINGER® TOP-CHEM 2005

BENEFITS / PROPERTIES

Suitable for many applications in the chemical industry - particularly strong acids. An economical alternative to top-chem-2000, when requirements are less extensive. Excellent sealing property at low to medium temperature, and pressure. Supplied in sheets as well as die-cut gaskets on request.

SPECIFICATIONS

- Material: Modified PTFE.
- Color: Red brown both sides.
- Compressibility ASTM F36A: 7%.
- Springback ASTM F36A: 35%.
- Pressure stability DIN 52 913 (1.5 mm): 25 N/mm² (150°C/30MPa).
- Gas leakage DIN 3535 / 6: <0.2 ml / min.
- Density: 2.0 g/cm³.
- Approvals: DIN DVGW, TA-Luft, KTW + FDA, German Lloyd.



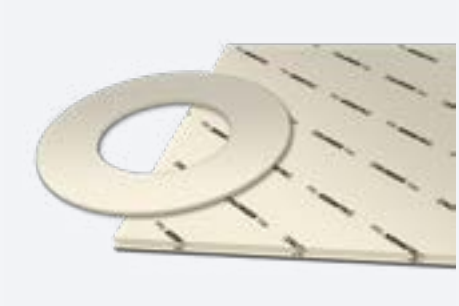
KLINGER® TOP-CHEM 2006

BENEFITS / PROPERTIES

KLINGER® Top-Chem 2006 is suitable for many applications in the chemical industry, incl. strong alkalis. It is an economical alternative to top-chem-2000, where requirements are less extensive. Excellent sealing property at low to medium temperature, and pressure. Free of pigments and therefore particularly suitable for food and pharmaceutical industry. Supplied in sheets as well as die-cut gaskets on request.

SPECIFICATIONS

- Material: Modified PTFE.
- Color: Light brown both sides.
- Compressibility ASTM F36A: 4%.
- Springback ASTM F36A: 40%.
- Pressure stability DIN 52 913 (1.5 mm): 18 N/mm² (150°C/30MPa).
- Gas leakage DIN 3535 / 6: <0.1 ml/min.
- Density: 2.9 g/cm³.
- Approvals: DIN DVGW, BAM, KTW + FDA, German Lloyd.



KLINGER® GAJA

BENEFITS / PROPERTIES

KLINGER® Gaja is the first gasket where the raw materials have been selected with a primary focus on properties that meet high environmental standards. This innovative gasket is specifically tailored for companies prioritizing and working according to ESG principles. The gasket can be used in a rich variety of applications, such as water, oils, fuels, hydrocarbons, inert gases, and alcohol at a moderate temperature.

SPECIFICATIONS

- Sheet size: 2000 x 1500 mm.
- Thickness: 0.8 mm, 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm.
- Tolerance: Thickness acc. to DIN 28091-1, length ±50 mm, width ±50 mm.
- Other thicknesses, sizes and tolerances on request.
- Approvals: DIN DVGW, TA-Luft, DNV GL .

KLINGER® KGS GII EPDM/NBR

BENEFITS / PROPERTIES

KLINGER® KGS GII is a rubber-steel reinforced gasket. The patented design of KGS GII enables the gasket to withstand high media pressures. The German institute TÜV SÜD has pressure tested and approved KGS GII for pressures up to 100 bar. Suitable for applications with low bolt force, slightly damaged flange surfaces and non-parallel piping.

SPECIFICATIONS

- Material: EPDM steel reinforced / NBR steel reinforced.
- Pressure: 1-100 bar, norm 6-40 bar.
- Tolerance hardness: 70° +/- 5° Shore A. DIN 53505.
- Dimensions: Up to DN 2000.
- Approvals: EN681-1 WAL, W270, ACS, German Elastomer Guideline, WRAS(BS6920), TA-Luft, KIWA(option). (FDA on request).

KLINGERSIL® C-4430

BENEFITS / PROPERTIES

Universal gaskets for general use up to 250°C. Very good pressure stability. Very suitable for steam and hot water. Does not stick on the flange.

SPECIFICATIONS

- Material: Synthetic and fiberglass bound with NBR, 3xA self-release surfaces.
- Sheet size: 1500 x 2000 mm or 1000 x 1500 mm.
- Thickness: 0.25 mm, 0.5 mm, 0.8 mm, 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm.
- Tolerance: Thickness +/- 10%, length +/- 50 mm, width +/- 50 mm.
- Approvals: DIN-DVGW, DVGW H2-ready (ZP 5123), DIN 16421 (W 270), DIN 30653 (VP 401), KTW-BWGL, WRAS, TA-Luft (Clean air), DNV, SVGW, Fire-safe acc. to DIN EN ISO 10497 and ISO 19921, EU/1935:2004 on request.

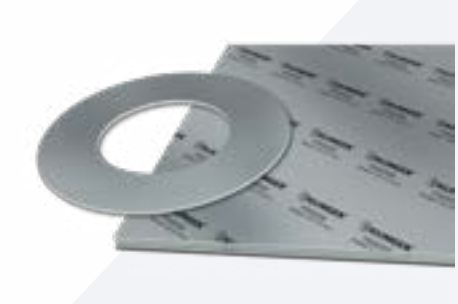
KLINGERSIL® C-4500

BENEFITS / PROPERTIES

Superior-performance gasket material designed especially for the chemical industry. Combining carbon fibers and special heat-resistant additives with an NBR bonding. Higher temperatures, alkaline media. Superheated steam are typical application scenarios where operators also profit from its resistance against oils, gases, salt solutions, fuels, alcohols, moderate organic and inorganic acids, hydrocarbons, lubricants and refrigerants.

SPECIFICATIONS

- Carbon fibers and special heat-resistant additives bonded with NBR.
- Resistant to creep and cold flow.
- Sheet size: 1000 x 1500 mm, 2000 x 1500 mm.
- Thickness: 0.5, 0.6, 0.8, 1.0, 1.5, 2.0, 2.5, 3.0 mm.
- Thickness according to DIN 28091-1, length: ± 50 mm, width: ± 50 mm.
- Approvals: BAM, DIN-DVGW, Elastomer-Guideline, ÖVGW Reg.No. G 2.143, DNV GL, TA-Luft, Fire-safe acc. to DIN EN ISO 10497.



KLINGERSIL® GRAPHITE LAMINATE PSM

BENEFITS / PROPERTIES

Manage 450°C in continuous operation in combination with high pressure. Suitable also 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

- Material: Graphite with perforated steel insert. AAA anti-stick surface.
- Purity: 98 % alt. 99.82 %.
- Density according to the customer's requests.
- Sheet size: 1000 x 1000 mm, 2000 x 1000 mm, 1500 x 1500 mm.
- Thickness: 0.6, 0.8, 1, 1.5, 2, 3, 4, 5 and 6mm.
- Tolerance: Thickness ± 5%, Length ± 5 mm, Width ± 5 mm.
- Can be supplied as rings in DIN, ANSI, and customized dimensions.
- Approvals: DIN-DVGW, Fire-safe acc. to DIN EN ISO 10497, German Lloyd, BAM.

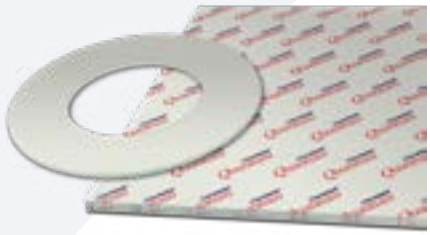
MAXIFLEX SPIRAL WOUND GASKET TYPE CR/CRIR

BENEFITS / PROPERTIES

Maxiflex is suitable in a wide range of industrial applications and in many media, including water, steam, oil, and many chemicals. Medium pressure seal for flanges "raised face" and "flat face". Excellent density sealing property even under varying temperatures and pressures. Easy handling and installation.

SPECIFICATIONS

- Type: CR/CRIR.
- Element: Graphite or PTFE / 316L.
- Outer ring: Epoxy coated Steel / stainless steel.
- Max. temperature: 450°C to 600°C.
- Max. pressure: 250 bar(g).



KLINGERSIL® QUANTUM

BENEFITS / PROPERTIES

KLINGER® Quantum with synthetic fiber in HNBR matrix, suitable for oils, water, steam, gases, salt solutions, fuels, alcohols, moderate organic and inorganic acids, hydrocarbons, lubricants, coolants. Unique, market leading fiber gasket material with high flexibility at high temperatures made from fibers and compounds of the highest quality. First gasket in the market where fibers and compounds only are bound by high temperature resistant HNBR via special developed production techniques.

SPECIFICATIONS

- Material: Synthetic fibers in HNBR matrix.
- Color: Off-white, both sides, with type printed on one side.
- Compressibility ASTM F36A: 10%.
- Springback ASTM F36A: Min. 60%.
- Pressure stability DIN 52913 (2 mm): 28 N/mm^2.
- Gas leakage DIN 3535/6: <0.02mg / S.M.
- Density: 1.7g/cm^3.
- Approvals: DVGW, Oxygen, TA-Luft, Fire-safe, FDA, EU/1935:2004.

VITON RUBBER SHEET FPM/FKM

BENEFITS / PROPERTIES

FKM/FPM rubber is known for its high resistance to chemicals, oils, acids, fuels and high temperatures. It is a chemically resistant material which is particularly suitable for aggressive media. This rubber is more expensive, but more economical in the long run. Due to its properties, durability and other performance parameters, especially on temperature, it's a more effective solution. It can withstand temperatures of up to 200°C (short-term 275°C). Has good compression set properties and is resistant to pressure and deformation, even at high temperatures.

SPECIFICATIONS

- Material: FPM/FKM.
- Size: From 0.5 to 10.0 mm, as well as die-cut gaskets on request.
- Color: White.
- Density 2.0 g/cm^3.
- Dimension tolerance: P2 DIN 7715/5.
- Temperature: -10°C to 200°C.
- Approvals: FDA EU/1935:2004 approved.
- On request, also available as blue food grade.

EPDM RUBBER SHEET

BENEFITS / PROPERTIES

Rubber sheet without inserts. Application: Water, glycol/water, acids, bases, food, and more. Available in sheets ranging from 0.5 to 20.0 mm (depending on hardness), also as customized gaskets and seals. Used as gaskets, sealing strips, edge protectors, and intermediate rubber. Excellent resistance to many organic fluids, including acid and alkali. VERY suitable for CIP. Not suitable for mineral oils and grease. Temp -30°C to 100°C.

SPECIFICATIONS

- Material type: EPDM 4660, sulfur cured.
- Color: White.
- Density: 1,15 g/m^3.
- Tensile strength: 45 MPa.
- Tolerance hardness: 60° +/-5° Shore A.
- Dimension tolerance: P2 DIN 7715/5.
- Temperature: -30°C to 100°C.
- Approvals: FDA - EU/1935/2004 on request.

NBR RUBBER SHEET

BENEFITS / PROPERTIES

NBR rubber sheets are available in sheets from 1.0 to 10.0 mm and as custom gaskets. Used as lists and gaskets with good resistance to mineral oils, grease, water, ethylene glycol. Not suitable for CIP.

SPECIFICATIONS

- Material type: NBR.
- Colour: White.
- Density: 1,32 g/cm^3.
- Tensile strength: 11 N/mm^2.
- Tolerance hardness: 60° +/- 5° Shore A.
- Temperature: -30°C to 80°C.
- Dimension tolerance: P2 DIN 7715/5.
- Approvals: US/FDA 21.CFR.177.2600. - EU/1935:2004 approved.

INSTRUMENTATION

LABOM CV4100 TRANSMITTER

BENEFITS / PROPERTIES

Labom CV4100 is hygienic and robust and suitable for diaphragm seal operation for relative and absolute pressure measurement. The V-line devices combine a very compact construction with the largest possible display. The intuitive 4-button operation assists the user with a dialog window on a high-resolution and well-illuminated dot-matrix display. Language can be set to English or German. A special quick setup feature simplifies fast installation and configuration of the devices.

SPECIFICATIONS

» Material case: Stainless steel, hygienic diaphragm seal.
» Material wetted parts: Stainless steel 316L.
» Ambient temperature: -40°C to 80°C.
» Accuracy: ≤ 0,1%.

LABOM MK1000 QUICK COUPLING DEVICE

BENEFITS / PROPERTIES

When it is necessary to replace or calibrate a measuring device, it usually calls for removal of the process connection. This not only interrupts the process, it also leaves the process open while this is done. This is often a time-consuming and costly procedure, especially for hygienic processes and those handling toxic or delicate substances, as is common in the pharmaceutical and chemical industries.

SPECIFICATIONS

» Material case: Stainless steel.
» Media temperature: -20°C to 160°C.
» Ambient temperature: -40°C to 80°C.
» Accuracy: ≤ 0,1 %.

LABOM MZ2300 CLAMP CONNECTION

BENEFITS / PROPERTIES

Labom MZ2300, inline unit ASEPT Connect for clamp connection per DIN 11864 is an alternative and a new way to mount standard transmitters for pressure and temperature measurements. The ASEPT Connect Inline unit allows installation of measuring instruments into pipes taking all requirements related to successful SIP and CIP procedures into account. The instrument connection is designed as Aseptic clamp connection per DIN11864-3.

SPECIFICATIONS

» Material case: Stainless steel 316L.
» Media temperature: -10°C to 140°C.
» Roughness: wetted parts Ra < 0.8 µm. external surfaces approx. 0.8 µm.

LABOM HP1110 THERMOWELL

BENEFITS / PROPERTIES

The HIT thermowell system guarantees hygienic and dead zone free invasive temperature measurement, especially for the requirements of the pharmaceutical/biotechnology industry. It can either be welded orbitally into a pipework system (seal free) or the connection can be made via industry standard process connections. Free of oil and grease (even for oxygen).

SPECIFICATIONS

- Material: Wetted parts stainless steel mat. no. 1.4435 (316L).
- Surface roughness: Ra ≤ 0.76 µm or 0.51 µm.
- Pipe standards: DIN 11866 series A / EN 10357 (DIN 11850), DIN 11866 series B / ISO1127, DIN 11866 series C / ASME BPE.
- Design: Straight pipe system.
- Measuring device connection: M12 x 1.
- Nominal pressure: Up to 25 bar.

LABOM GA3110 REFERENCE SENSOR

BENEFITS / PROPERTIES

The reference sensor is used for the in-process calibration of resistance thermometers. This requires a special measuring insert with test pipe. This makes it possible to calibrate the installed resistance thermometer without disassembling the measuring insert. Especially suitable for the pharmaceutical industry.

SPECIFICATIONS

- Material: Stainless steel mat. No. 1.4571 (316 Ti).
- Temperature range: -50°C to 400°C.
- Size measuring insert: Ø6 mm.
- Measuring resistor: Per DIN EN 60761
- Accuracy measuring resistor: Class A per EN 60751.

LABOM GA2730 THERMOMETER

BENEFITS / PROPERTIES

Labom GA2730 is a resistance thermometer MiniTherm and designed for the installation in a separate thermowell. Because of its compact design MiniTherm is suitable for use in a great number of technological processes, e.g. in the pharmaceutical industry.

SPECIFICATIONS

- Material case: Stainless steel
- Design: Measuring insert Ø3 mm, spring loaded and union nut M12x1
- Temperature accuracy: Class A
- Ambient temperature: -20°C to 80°C
- Range: -50°C to 200°C
- Media temperature: -50°C to 200°C.

LABOM GA2610 THERMOMETER

BENEFITS / PROPERTIES

The resistance thermometer in clamp-on technology is used for temperature sensing and process control, mainly for sterile applications in the food and pharmaceutical industries. The resistance thermometer can be quickly and easily fitted to all existing pipework. There are no changes necessary to the piping and no welding required. The resistance thermometer can be supplied with a built-in transmitter.

SPECIFICATIONS

- Material case: Stainless steel.
- Measuring resistor 1xPt100 or 2xPt100, class A.
- Temperature accuracy: Class A.
- Ambient temperature: -40°C to 80°C.
- Range: -40°C to 150°C
- Media temperature: -40°C to 150°C.

LABOM BH8100/BH8200 PRESSURE GAUGES

BENEFITS / PROPERTIES

The BH8 pressure gauges have been engineered to meet the highest hygiene requirements in the food, pharmaceutical and biotechnology sectors. It can be supplied with a wide variety of hygienic process connections. Its hygienic case design conforms to EHEDG recommendations, ensuring optimum cleaning capability, e.g. in autoclaves. Removing case parts (e.g. the vent valve) is not necessary.

SPECIFICATIONS

- Material case: Stainless steel.
- Material wetted parts: Stainless steel.
- Measuring range: -1 to 15 bar.
- Media temperature without liquid filling: 10°C to 140°C
- Media temperature with liquid filling: 10°C to 140°C.
- Ambient temperature without liquid filling: 10°C to 50°C.
- Ambient Temperature with liquid filling: -10°C to 50°C.
- Accuracy: Class 1,0 + 1,6.

LABOM BC4200 PRESSURE GAUGE

BENEFITS / PROPERTIES

The pressure gauge with flush mounted diaphragm is particularly suitable for hygienic process engineering. It is suitable for CIP and SIP cleaning and all wetted parts are made of stainless steel 1.4435 (316L) and are completely welded.

SPECIFICATIONS

- Material case: Stainless steel 316L.
- Material wetted parts: Stainless steel.
- Measuring range: -1 to 5 bar.
- Media temperature: -20°C to 150°C.
- Ambient temperature: -20°C to 70°C.
- Accuracy: Class 1,6, optional 1.0, 2%.
- Process connection: Hygienic diaphragm seal.

KLINGER US201 ULTRASONIC FLOWMETER

BENEFITS / PROPERTIES

KLINGER US201 is a wall-mount, clamp- on type ultrasonic flowmeter. It is easy to install and no need to cut off the pipe that saves you lots of troubles and cost. US201 has our unique calculate software to ensure the high accuracy and low velocity response. Suitable for the pharmaceutical industry, water treatment, pure water, chemical, etc. US201 can also be delivered as an energy meter, monitoring the energy use.

SPECIFICATIONS

- Dimensions: DN25 to DN1200.
- Transmitter: PC/ABS, IP65.
- Sensor type: Transducer encapsulated design.
- Accuracy: Liquid +/- 1% FS.
- Output signal: 4-20 mA Max load 750 Ohm, OCT (min. and max. frequency is adjustable).
- Scaled pulse output: 0-9999Hz.
- Communication: RS232 and RS485.

KLINGER LDG MAGNETIC FLOWMETER

BENEFITS / PROPERTIES

KLINGER LDG is a magnetic inductive flowmeter for accurate measurement of liquid in all kinds of industrial plants, as well as in water, wastewater and cooling systems. The program is primarily for application in water, wastewater, refrigeration and energy sector, but can also be used within many industrial tasks.

SPECIFICATIONS

- Dimensions: DN06 to DN2200.
- Process connection: Flange EN 1092-1, JIS B2220 or ANSI 16.5
- Output signal: 4-20 mA, Scaled pulse output, 2 x contact for alarm/status.
- Liner: Hard rubber, PTFE or PPO.
- Electrodes: SS 1,457, Hastelloy C, Tantalum or Platinum-Uridium.
- Communication: HART, Modbus RS485 or GPRS.

KLINGER LUGB-G VORTEX FLOWMETER

BENEFITS / PROPERTIES

KLINGER LUGB is a Vortex flowmeter used for liquid, gas and steam measurement. It will be delivered either with flanges or as wafer. For steam and gas measurement, a model with integrated pressure and temperature sensors is available.

SPECIFICATIONS

- Dimensions: DN15 to DN300.
- Process connections: Flange or wafer.
- Wetted parts: Stainless steel (304 or 316).
- Sensor type: Piezoceramic sensor.
- Accuracy: Liquid +/- 1% of measurement value (Re ≥ 2000).
- Gas / vapor: +/- 1,5% of measured value (Re ≥ 2000).
- Output signal: 4-20 mA max. load 300Ohm.
- Scaled pulse output.
- Communication RS485 (Modbus).

KLINGER GF GEAR FLOWMETER

BENEFITS / PROPERTIES

KLINGER's gear flowmeters are made with wetted parts in stainless steel, alternatively aluminum. The measuring principle means that it can be used for virtually all types of liquid - and the measurement result will be the same regardless of the viscosity of the liquid. For media with viscosity up to 10,000 Pa.s

SPECIFICATIONS

- Dimensions: DN4 to DN32 mm.
- Process connection: Thread cut or flange.
- Media affected parts: Aluminum or stainless steel.
- Mesurements: 0.6 - 50 l/h to 2.000 - 20.000 l/h.
- Pressure: Max. 150 bar (Aluminum), max. 400 bar (stainless steel).
- Accuracy: Liquid: ± 0.5% of measured value.

KLINGER BT BIMETAL THERMOMETER

BENEFITS / PROPERTIES

Temperature is the most measured parameter in modern process engineering, and local indicators (thermometers) are used in all types of installations. Thermometers can be constructed in different ways depending on need and price. For industrial use, the dial thermometer is most common, while the machine thermometer is most often seen in utility and supply tasks. At KLINGER, you will find both disc thermometers (bimetal and gaseous), as well as liquid-filled machine thermometers.

SPECIFICATIONS

- Dimensions: 80, 100, 125 and 150.
- Material case and ring: AISI 304 stainless steel, AISI 316 on request with option V61, with bayonet bezel.
- Connections: G½" or ½ NPT.
- Sensor insertion length: 75 - 500 mm, diameter ø6mm or Ø8 mm.
- Indication range: -50°C to 600°C.
- Protection degree according to EN 60529: IP 55 for dry exection, IP 67 (option V66 and V72).
- Temperatures: From 1/10 to 9/10.
- Accuracy according to EN 13190: Class 1.

KLINGER 208 PRESSURE GAUGE

BENEFITS / PROPERTIES

KLINGER gauge series 200, Ø100 with bourdon tube that can be used to measure pressure in almost every industry/ application. Our gauges are produced in EU and can be delivered with calibration certificate. Industrial design acc. to EN 837-1 with connection type lower or back and with/ without liquid filling.

SPECIFICATIONS

- Dimension: Ø100 mm.
- Dimension housing: Ø100 mm, 1.4301 (AISI 304).
- Process connection: G½" lower or back.
- Wetted parts: Stainless steel (AISI 316).
- Ranges: -1 o 1.600 bar(g).
- Accuracy class: 1.0.
- Ingress protection: IP 65 w. liquid filling and IP 54 wo. liquid filling.

KLINGER SIGHT GLASS

BENEFITS / PROPERTIES

KLINGER sight glasses are suitable for installation in almost any type of liquid. We manufacture our sight glasses in-house using either soda-lime glass or "extra hard" borosilicate glass, which is subsequently heat-treated. Our sight glasses have high mechanical strength and are exceptionally resistant to bases, acids, and boiler water (within operating limits). Our in-house glass testing laboratory conducts ongoing quality controls: glass purity, glass defects, measurement accuracy, etc. Suitable for furnaces, boilers and silos.

SPECIFICATIONS

- Type: Round standard glass, hardened, grounded and polished.
- Material: Sodium and limestone, tempered.
- Temperature: 150°C.
- Variants: Glass in other materials and dimensions.

KLINGER DRAINPROOF SIGHT GLASS

BENEFITS / PROPERTIES

This unique sight glass offers a reliable and hygienic solution for process monitoring. The sight glass ensures 100% drainability and provides optimal performance for industries requiring complete drainage. Designed for welding into vessels, it meets PED requirements and withstands temperatures up to 200°C. The gasket and sealing materials are FDA-approved and ADI-free, ensuring safety and compliance.

SPECIFICATIONS

- 100% drainable sight glass. According to PED iht. EN13445.
- Max. temperature: 200°C.
- Gasket / sealing: FDA approved and ADI-free.
- Accessories: Illumination, ATEX approved Illumination.

KLINGER TRANSPARENT LEVEL GAUGES

BENEFITS / PROPERTIES

Reading the liquid level in the gauge glass is performed by the naked eye, which is why it is important that the material is transparent, making the liquid level visible. Transparent gauges are the most common types and are used in all standard applications, particularly when the medium is not transparent, the systems' translucency is improved with an artificial light source which is mounted to the rear, improving visibility. Reflex and magnetic gauges are also available.

SPECIFICATIONS

- Model: 100-D.
- Material: Steel A 105 N.
- Pressure range: PN 100 / ANSI 600 lbs.
- Temperature: 400°C, steam 235°C/30 bar.
- Transparent glass: Toughened borosilicate glass, type B.
- Connection: Flanges PN 40.

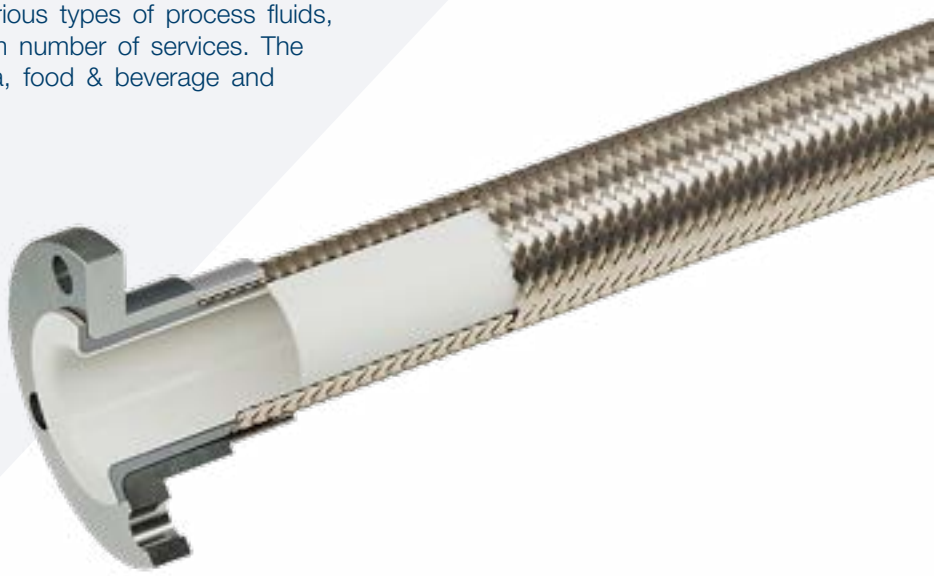
KLINGER METAL HOSES WITH PTFE

BENEFITS / PROPERTIES

KLINGER flexible metal hoses are long-lasting. Manufactured from stainless steel, as braided and non-braided. For multiple applications and purposes. They can be supplied with various types and fittings/connections. They provide extremely good flexibility in terms of connecting, transferring various types of process fluids, having very high lifespan, and requires minimum number of services. The PTFE lined metal hoses are optimal for pharma, food & beverage and hygienic applications.

SPECIFICATIONS

» Size: From DN25 to DN100.
» Design pressure: Up to 34,5 barG.
» Design temperature: Up to 177°C.
» Connections: Various.
» Standards: Various.
» Bellow material: Hose material: PTFE. Braid material: AISI 316.
» Accessories: N/A.
» Fluid/Applications: Various.



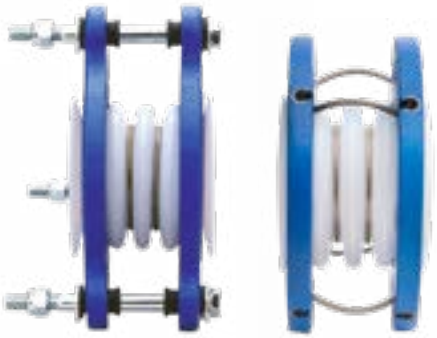
KLINGER METAL HOSES

BENEFITS / PROPERTIES

Our flexible metal hoses are long-lasting as they are manufactured from stainless steel, as braided and non-braided. The hoses can be used in multiple applications and purposes. They can be supplied with various types og fittings/connections. They provide extremely good flexibility in terms of connecting, and transferring various types of process fluids, from different installations and displacements, having very high lifespan and requires minimum amount of services.

SPECIFICATIONS

» Size: DN6 to DN150 (for other sizes check with us).
» Design pressure: Up to 245 bar(g).
» Design temperature: Up to 400°C.
» Bellows material: AISI 304, 316/316L, 321.
» Flanged and hardware material: CS/SS/Customized.



KLINGER PTFE EXPANSION JOINTS

BENEFITS / PROPERTIES

KLINGER PTFE expansion joints are available in circular shapes. For midrange pressures but high corrosivity resistance. Useful especially in pharmaceutical, chemical, food & beverage industries. The bellow surfaces make them very suitable for applications where clean in-place (CIP) occurs and with the smooth surfaces they are suitable for many cleanings required. They obtain high corrosion properties for chemical and corrosion/aggressive media at high temperatures.

SPECIFICATIONS

- Size: DN25 to DN600.
- Design pressure: Up to 14 barG.
- Design temperature: Up to 230°C.
- Connections: Flanges (CS, SS, alloys).
- Standards: EN / ASME / Customized.
- Bellow material: PTFE.
- Fluid / Applications: Gas / Liquid.

KLINGER T8.500 EPDM/NBR RUBBER

BENEFITS / PROPERTIES

KLINGER rubber body is typically strengthened with reinforced fabric keeping it strong and maintain flexibility at the same time. Good heat resistance, suitable for alkaline wastewater and for some chemical compounds (except hydrocarbons). Water and non-aggressive liquids. Horizontal or vertical mounting. Suitable for oils / fatty media. KLINGER's rubber expansion joints also come with threaded unions according to ISO 228-1.

SPECIFICATIONS

- Size: DN32 to DN600.
- Bellow (modulation) material: EPDM, NBR.
- Design pressure: Up to 16 bar(g).
- Design temperature: 80°C (NBR) and 100°C (EPDM).
- Union material: Carbon steel, stainless steel.
- Bellow material: EPDM / NBR and connection in galvanized steel / AISI 304 (EN 1.4301).

KLINGER TYPE F8.500 EPDM/NBR RUBBER

BENEFITS / PROPERTIES

KLINGER rubber body is typically strengthened with reinforced fabric keeping it strong and maintains flexibility at the same time. Good heat resistance, suitable for alkaline wastewater and for some chemical compounds (except hydrocarbons), water and non-aggressive liquids. Horizontal or vertical mounting. Suitable for oils / fatty media.

SPECIFICATIONS

- Size: DN32 to DN600.
- Bellow (modulation) material: EPDM, NBR.
- Design pressure: Up to 16 barG.
- Design temperature: 80°C (NBR) and 100°C (EPDM).
- Flange material: Carbon steel galv., stainless steel. DIN 2532.
- Accessories: Threaded movements/length limiters – F8 kits.

KLINGER TYPE KB

BENEFITS / PROPERTIES

Welded end expansion joints are available in various grades of carbon, stainless steel, or nickel alloys. KLINGER offers a wide range of design capabilities and manufactures according to industry standards or specific customer requirements. Ideal for high pressure environments where welding is feasible, and leakage is a concern. More economical than flanged types due to the absence of costly flanges and gaskets. Require no maintenance.

SPECIFICATIONS

- Size: DN25 to DN1000.
- Design pressure: Up to16 barG.
- Design temperature: Up to 400°C.
- Bellows material: AISI 304, 316, 321 or nickel alloys.
- Connections: Fixed flanges.
- Standard: EN / ASME.
- Accessories: Limit rods.
- Fluid / Applications: Gas / Liquid.

KLINGER TYPE DF, FLOATING FLANGED

BENEFITS / PROPERTIES

Floating flanged expansion joints feature rotating flanges that comply with various industrial standards or specific customer requirements. The rotating flanges are protected against internal media and enable alignment of the bolts during installation. These joints are suitable for lower/mid-range pressure applications, especially with corrosive/aggressive media. Allows the use of lower grade steel, offering cost savings. No welding is required on site. These can be designed and supplied as single or universal types.

SPECIFICATIONS

- Size: DN25 to DN1000.
- Design pressure: 0,5 to 16 barG.
- Design temperature: Up to 400°C.
- Bellows material: AISI 304, 316, 321 or nickel alloys.
- Flanged material: Carbon steel, stainless steel, customized.
- Quick connection.

KLINGER TYPE SF, FIXED FLANGED

BENEFITS / PROPERTIES

Fixed flanged expansion joints feature welded flange connections. Meet various industrial standards or specific customer requirements. The flanges, welded to the bellows, are non-rotating. Ideal for higher pressure applications where sealing is critical. Recommended to match the flange material to the piping grade. Avoid bolt misalignment during installation. No field welding is required. Commonly used across industries by different utility areas.

SPECIFICATIONS

- Size: DN25 to DN1000.
- Design pressure: 0,5 to 16 barG.
- Design temperature: Up to 400°C
- Bellow material: AISI 304, 316, 321 or nickel alloys.
- Fanged material: Carbon steel, stainless steel, customized.
- Connections: Fixed flanges.
- Standard: EN / ASME / Customized.
- Accessories: Tierods / limit rods.
- Fluid / Applications: Gas / Liquid / Solids.

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