



THE GLOBAL SUPPLIER FOR GLOBAL DEMANDS

Quality / Innovation / Service



INDUSTRY



INFRASTRUCTURE



PULP & PAPER



OIL & GAS



ENERGY



TRANSPORT



CHEMICAL



PHARMA



FOOD & BEVERAGE



KLINGER UK

INVESTMENT

The leading developer, manufacturer and distributor of quality sealing solutions to global industry.

Truly a global supplier, Klinger also tailors its products and services to meet specific local demand.

Presently, over 40 companies and more than 80 distribution companies represent the Klinger organisation throughout the world, making it one of the world's leading sealing companies.

Klinger's extensive range of metallic, semi-metallic gaskets and flange accessories are a key component in on-shore and off-shore installations for the petrochemical, chemical, pharmaceutical, food and aerospace industries.

Whilst most other UK sealing suppliers chose to outsource their production, to take advantage of low labour costs, Klinger opted to invest heavily in the latest manufacturing techniques. Crucially, this enabled Klinger UK to maintain control over the quality of its product range and the efficiency of its service and delivery demands providing commercial edge and security.

"We are very proud of the fact that with the right investment in equipment and people our quality and competitively priced semi-metallic and metallic gaskets can still be successfully produced in the British Isles."

Mick Foulds, Managing Director, Klinger UK Limited.

Klinger UK has experienced the evolution and globalisation of the petrochemical and chemical industries alongside its clients and recognises that continued investment in the latest manufacturing technology and distribution facilities is essential to its success.

As part of a multi-million pound investment programme Klinger UK has:

- » Launched a specialist aerospace and defence test laboratory, achieving the coveted ASCS accreditation and BS EN 9100:2009 certification.
- » Invested in the latest water-jet profiling and CNC Knife cutting facilities. Incorporating the latest non-contact optical measuring equipment, an essential requirement for supply to the aerospace industry.

» Introduced Klinger Precision, a new facility which specialises in precision machined components using the latest CNC Turning, Milling, Grinding and state of the art WEDM equipment. Further enhancing our expertise to meet client demand for precision and bespoke components.

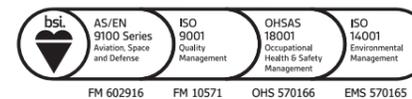
» Installed a second fully Automated Press Line doubling output on all 'standard' Spiral Wound Gaskets.

» Through the acquisition of Acorn Seals, a leading European Manufacturer and Distributor of Elastomeric Hydraulic Seals, we have further complemented our existing worldwide supply network for Industrial Sealing and associated products.

» Expanded the size of our existing Bradford production facility and doubled specialist distribution centres in both Scotland and the North-West of England, to meet emergency manufacturing and service demands, which are vital to UK industry.

» Introduced the latest testing and training on Torque to Load relationships, Gasket Compression Rates, Component Stress and Installation Techniques using FADU equipment, alongside standard ASME high temperature and high pressure testing rigs.

» Increased service centres, with the introduction of a new manufacturing and distribution branch in Immingham.



2,300 employees
2,300 employees work for the KLINGER Group worldwide

£460 mil. annual sales
520 million euros were generated by the KLINGER Group in financial year 2017

80 countries of the world to which the Group has already exported
19 production locations worldwide
for seals, valves and instrumentation

60 countries worldwide hosting subsidiaries or a representative of the KLINGER Group

Current customers include...

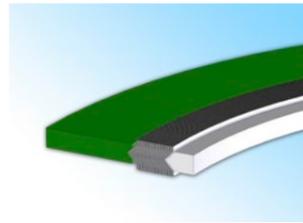


SPIRAL WOUND GASKETS

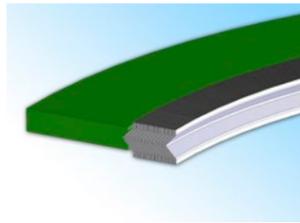
- » High integrity seal for use with virtually all media dependent upon style and filler material.
- » Spiral wound gaskets have the ability to recover under the action of fluctuating loads caused by process fluid pressure and temperature changes, flange face temperature variations, flange rotation, bolt stress relaxation and creep.
- » The gasket sealing element consists of a pre-formed metallic winding strip with layers of a softer, more compressible sealing material which, during compression, is densified and flows to fill imperfections in the flange surfaces when the gasket is seated. The metallic strip holds the filler giving the gasket mechanical resistance and resilience.
- » Available in a wide range of material combinations to suit applications.
- » Klinger Maxiflex spiral wound gaskets also meet the tightness requirements of TA-Luft.
- » Klinger Maxiflex spiral wound gaskets are fire safe to API 6FB.



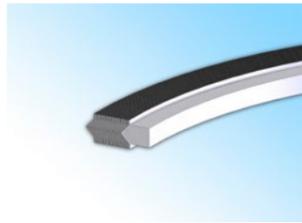
Main types available



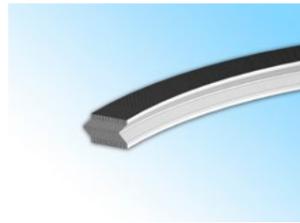
CRIR



CR



RIR



R

Filler Material	Maximum Temperature	Maximum Temperature
Graphite	500°C	Grey stripe
PTFE	260°C	White stripe
Mica	1000°C	Light Green
Mica & Graphite, Zonal	900°C	N/A

KAMMPROFILE

The Klinger Maxiprofile is a composite gasket, which utilises a serrated metal core with a soft facing material. The metal core is machined on each contact face with concentric serrations which provide high pressure areas, ensuring that the soft coating flows into any imperfections in the flange even at relatively low bolt loads. The result is a gasket, which combines the benefits of soft, cut materials with the advantages of seal integrity associated with metallic gaskets.

Expanded graphite is the most common facing material used for Maxiprofile gaskets. However, other materials can be used, such as PTFE for chemically aggressive duties or mica for high temperature duties.

Maxiprofile gaskets can be manufactured from a range of core materials according to media compatibility and temperature considerations.

Facing Material	Maximum Temperature
Graphite	500°C (application dependant)
PTFE	260°C
Mica	1000°C
KLINGERSil C-4430	250°C



SAFEGUARD

- » Specially designed to combat flange face corrosion issues associated with industry.
- » Safeguard limits further corrosion, giving asset managers and engineers essential quality assurance and cost savings.
- » Corroded flanges maybe remade quickly without the need for other repair methods.
- » Halts in production are reduced, avoiding major loss of revenue.
- » Fire Safe to API 6FB.



RING TYPE JOINTS

INSULATION SETS / SHIELD

RING TYPE JOINTS



- » Metallic ring joint gaskets are heavy duty, high integrity seals largely used in offshore and petrochemical applications. They are precision-engineered components designed to be used in conjunction with precision-machined flanges. All our Ring Joints are manufactured according to ASME B16.20 and API 6A or API 17D.
- » The gasket material is selected on a number of grounds, primarily chemical compatibility with the media and the hardness of the flange.
- » Extensive stock availability and in-house manufacturing capability to meet the tightest delivery schedules.

Type	Nominal Pipe Size	Class Ratings
Type R Oval and Octagonal	1/2" to 24"	150 to 2500 ASME B16.20
	26" to 36"	300 to 900 ASME B16.20 Series A
	1 1/2" to 20"	API 6A
Type RX	1 1/2" to 20"	720 to 5000 API Flanges
Type BX	1 11/16" to 21 1/4"	5000 to 20000 ASME B16.20



KLINGER PRECISION

To service the ever expanding high pressure and subsea sealing applications market Klinger has invested heavily in Klinger Precision, increasing capacity for the UK manufacture of Ring Type Joints to ASME B16.20, API 6A and API 17D.

State of the art machining centre, servicing Klinger's increasing growth in exotic alloy, precision, high integrity sealing solutions. Precision CMM measuring equipment ensures manufacturing excellence together with reverse engineering capabilities.

INSULATION SETS / KLINGER SHIELD



General Properties

- » Cathodic Isolation.
- » Mitigate against galvanic corrosion.
- » High Integrity sealing solution.
- » Fire Safe to API 6FB.
- » Trusted materials including Klingsil Top-chem and Thermica.
- » RF and RTJ flange options.
- » Designed and manufactured in the UK.



Klinger UK is the major distributor of GPT products.



SENTRY REVERSE INTEGRITY GASKET



General Properties

- » Reverse Integrity Gaskets available for use on RTJ and RF flanges.
- » Allows leak testing of individual flange joints via Sentry testing system.
- » Significantly reduces pressure testing and flange integrity test duration.
- » Reduction in Nitrogen volume usage.
- » Hydraulic Oil and Nitrogen test media options.
- » Designed and manufactured in the UK.



SOFT CUT GASKETS / SHEETING

QUANTUM, TOP-SIL AND KLINGERSIL

Quantum, Top-sil and Klingersil are ranges of specially formulated non-asbestos fibre based materials designed to meet the highest standards of performance. Based on inorganic or organic fibres blended with elastomeric compounds, they are used on a wide range of industrial applications.

General Properties

- » Capable of sealing a wide range of industrial applications
- » Easy to handle and install
- » Excellent bolt stress retention properties
- » Excellent sealing performance
- » 3xA anti-stick finish on both sides
- » Economical
- » Fire Safe

Applications (Dependent on grade)

- » Resistant against oils, solvents, gases, steam and many dilute acids and alkalis
- » Controlled swell grades available for applications with low bolt load
- » Food processing
- » Potable water
- » Automotive
- » Valves and Pumps
- » Variety of test and certifications
- » Chemical resistant grades also available
- » Quantum also available with FDA Conformity

Quantum offers unparalleled performance for a compressed non-asbestos fibre material in high temperature applications and is suitable for continuous service at 350°C.

Main Klingersil grades are C-4430, C-4400, C-4500, C-4324 with other grades available.



SLIP / SPECTACLE PLATES AND BLANK FLANGES

SLIP / SPECTACLE PLATES AND BLANK FLANGES

Slip Plates, Spacer Rings and Spectacle Plates

Manufactured to standard sizes or customer specifications in accordance with BP, Shell, ConocoPhillips, Texaco, Ineos, API590 and B16.48 standards. Faces manufactured to suit raised face flanges or ring type joint flanges.

Sizes – ½” to 80”

Materials

Carbon Steel – All grades
Stainless Steel – 304, 304L, 304H, 316, 316L, 321, 410 Duplex, Super Duplex
Inconel – All grades
Nickel Alloy
Hastelloy

Plate Flanges and Blanks

Profile cut flanges from plate to British, European, American and Japanese standards, as well as customers' own requirements.



KLINGER TOPLINE GLAND PACKINGS

Drawing upon more than 100 years packing experience coupled with modern production methodology and comprehensive test facilities, the Klinger TopLine range has been carefully structured to meet current needs.

The optimised range of compression packings and graphite seals has been introduced to provide users with gland sealing products that meet today's demanding industrial services.



EXFOLIATED GRAPHITE LAMINATES

Exfoliated Graphite Laminates can be supplied either with or without filler materials in varying forms; tanged, foil insert and with eyelets. They don't contain a rubber binder and are not subject to hardening of the material.

General Properties

- » Excellent resistance to steam
- » Resistant to virtually all media
- » Outstanding resistance to high and low temperature
- » High compressibility
- » Good leakage properties
- » Unlimited storage life
- » Anti-stick finish on both sides

Applications

- » Low bolt loads
- » Sealing of damaged flange surfaces
- » Hot oil equipment
- » Gas-to-liquid plants
- » Heat exchangers
- » Nuclear power plants
- » Cylinder head and manifold gaskets for engines and compressors



KLINGER FLUID CONTROL

VALVES

Klinger manufactures a range of well renowned valves for use in a variety of industries including district heating systems, power stations and buried pipelines where reliable, maintenance-free valves are required.

Klinger manufactures the following types:

- » Ballostar KHI
- » Ballostar KHE
- » Ballostar KHA
- » Monolith KHO
- » Monoball KHM
- » KVNPiston valves



HYDRAULIC SEALS, RUBBER O-RINGS & GASKETS

Klinger Acorn carries large stocks of British Standard size O-rings in Viton and Nitrile rubber. Other materials including HNBR, Neoprene, EPDM and Silicone are available on request. We are also able to supply metric sizes in a similar range of compounds.

Other products available in the Klinger hydraulic sealing range include: Wiper Rings, Piston Seals, Geopak Seals, Flexi-wear rings, Bonded washers, speciality lubricants and O-ring fitting tools.

Rubber gasket materials offer a low cost sealing solution for applications where the additional strength offered by fibre reinforcements is not a requirement. Rubber gasket materials are commonly used in plastic flanges, water services and some grades can be used in food and pharmaceutical applications.

Materials stocked: EPDM, Neoprene, Nitrile and Viton with other materials available upon request.



LEVEL GAUGES

Magnetic Level Gauges

The Klinger magnetic gauge is designed so that the liquid being measured is enclosed within a sealed chamber.

A magnetic float flips the magnetic wafers to indicate the level:

- » Suitable for aggressive chemicals
- » Very easy to read
- » High pressures
- » High temperatures

Reflex Level Gauges

The Reflex Level gauge, available in the range ANSI class 150 to 1500, is particularly suitable for gas liquefaction plants, reactor vessels, low-pressure boilers and storage vessels. The reflex glass allows light to be absorbed by the liquid giving a dark appearance and thereby provides a clear indication of the liquid level.

- » Distinct black and silver indication
- » Pressures up to ANSI class 1500 (250 bar)
- » Temperature range -196°C to +400°C

Transparent Level Gauges

The Transparent Level gauge, available in the range ANSI class 150 to 1500, is particularly recommended for:

- » Corrosive media
- » Viscous and coloured media
- » Interface Applications
- » When illumination is needed
- » Pressures up to ANSI class 1500 (250 bar)
- » Temperature range -196°C to +400°C

HOSES & EXPANSION JOINTS

Klinger manufactures a range of expansion joints and hoses. Klinger expansion joints suit a variety of applications and the range includes:

- » Fixed & floating flanged expansion joints
- » Welded end expansion joints
- » Expansion joints for external pressure environments
- » Rubber expansion joints
- » Expansion joints with limiting rods
- » Flexible hose connectors
- » Vibration absorbers



STUD BOLTS

STUD BOLTS

Klinger supply the petrochemical industry with many different types of bolting. From standard to bespoke stud bolts. Ranging from 1/4" to 3" diameter. Klinger can also supply forged bolts to suit your requirements in all material grades. Different coatings can be specified including **PTFE, Zinc or Galvanised**. Other coatings are available on request.



PTFE

PTFE has excellent chemical resistance and is only attacked by molten alkali metals and hydrogen fluoride compounds at elevated temperatures making it suitable for a wide range of severe chemical applications.

Properties include:

- » Suitable for use with food and pharmaceutical applications
- » Excellent chemical resistance

Klinger Top-chem range

A range of modified PTFE materials, designed to improve the mechanical strength and creep resistance of the material without decreasing chemical properties.

Gore Sealant Technologies range

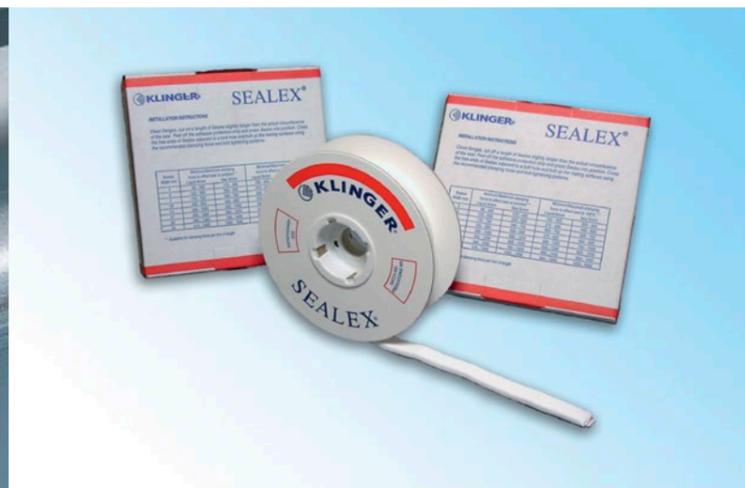
As an Active Partner with Gore we can supply a range of their materials including Gore DF tape, Gore series 500 and 1000 tape, Gore UPG gaskets and Gore GR sheeting.

Sealex PTFE Joint Sealant

Reliable versatile gasketing on a roll. Sealex is a soft highly compressible sealing material which has a pressure sensitive adhesive backing to assist with installation.

Thread Seal Tape

Available as a one wrap seal for gas applications and also as a general Thread Seal for liquids.



PRECISION ENGINEERING

Klinger UK's precision production facility specialises in highly complex machined parts. Housing a range of specialised machinery, including CNC Milling and Turning, Surface and Cylindrical Grinding, as well as the latest WEDM equipment.

Klinger Precision is supporting Klinger UK's pre-existing and ever increasing demand for exotic alloy RTJ's for the offshore Oil and Gas Industries



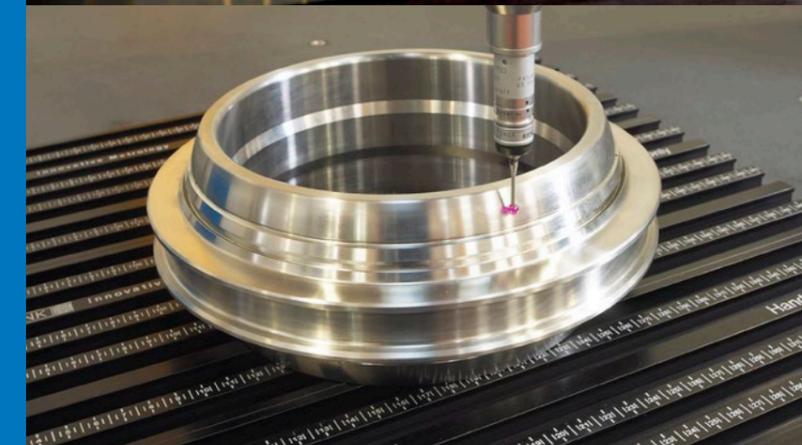
PRODUCTS

- » BOP wellhead rings
- » Machined components from one-off bespoke products to multi-batch work
- » Tubesheets
- » Press tool design & manufacture
- » Baffle plates



CAPABILITIES

- » Wire erosion
- » Milling
- » Grinding
- » Turning
- » High precision measurement using latest CMM equipment



AEROSPACE



In addition to using advanced technology manufacturing equipment, our aerospace and defence team works in close liaison with our clients to ensure their supply requirements are met to the highest standards achievable.

Our high precision water-jet profile cutting facility produces both non-metallic and metallic components. Software controlled water-jet tilting jet technology allows the production of taper free components.

The cutting kerf angle normally found with water-jet profiling is moved completely into the scrap zone, producing 90 degree cut edges. Water-jet cutting does not produce heat affected zones or structural material changes in the cut edge and is distortion free.

Our Knife cutting facility features a robust CNC machine, utilising drag or oscillating knife cutting techniques combined with automatic hole punching, for high accuracy conversion of gaskets from sheet material. Flexible vacuum control and

optical projection of cutting plans create the highest quality products.

Our optical measuring machine is a non-contact, measuring device utilising video camera technology. Non-contact measuring methods provide control of measure points and avoid the distortion of surfaces caused by contact, retaining integrity and eliminating subjectivity. Klinger utilises the equipment to provide first article product information that is used to perfect the production process.

TECHNICAL SERVICES

Klinger has a vastly experienced technical team servicing clients globally from the UK. Technical services including, conceptual design services, CAD and FEA, gasket integrity and torque calculations, bespoke sealing solutions, on site support, inventory rationalisation and competency training.

Training and Awareness:
Klinger has established a proud engineering knowledge based on sound engineering practises, industry knowledge and client confidence.

Our material, product and application understanding has enabled Klinger to establish our Technical Training Centre in Bradford.

Klinger can offer training packages ranging from bespoke sessions to fully accredited competency training certified by ECITB.

With the latest testing and training equipment including our Klinger Assembly Demonstration Unit we aim to:

- » Increase best practice techniques and competency.
- » Offer interactive, practical and tailored learning.
- » Demonstrate real-time information on gasket compression, bolt stress and pre-load.
- » Material awareness and development.
- » Gasket appreciation and sealing solutions.

PROJECTS AND INTERNATIONAL

The Projects and International team has a focused way of conducting business with E & C customers by bringing together a group of people dealing only with the contracting industry on a worldwide basis.

Our UK based project personnel are experienced in supplying sealing materials for major contracts, having been involved with many new build contracts from grassroot refineries, onshore gas plants, various chemical plants and pharmaceutical installations, concrete and steel jackets/platforms, subsea installations and FPSO's.

Klinger Projects control and support all aspects of the project from the initial bidding through to final project handover. This has been done by bringing together different disciplines to assist in each stage of the project.

The success of Klinger projects is built on a sound technical knowledge and the ability to offer a bespoke service that can only be achieved with the backing of a state of the art manufacturing facility. This is demonstrated by the successful supply of sealing materials to major contractors involved in new build projects, globally.



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