



# THE GLOBAL SUPPLIER FOR GLOBAL DEMANDS

Product · Service · Solution



## KLINGER UK

## Industry leading supplier of sealing solutions, from Gasket Design and Manufacturing through to a full range of self-delivered On-site Field Engineering Services

KLINGER UK forms an integral part of the globally active KLINGER Group; a family business established in 1886 by Austrian engineer Richard Klinger. The KLINGER Group remains at the forefront of the sealing, fluid control, and fluid monitoring industries through investment in continuous research and development. With over 40 companies and more than 80 distribution companies in the world; we are a global leader in innovation.

KLINGER'S extensive range of metallic, semi-metallic gaskets, soft cut gaskets, valves, fluid control, and onsite engineering services are a key component in on-shore and off-shore installations for the petrochemical, chemical, pharmaceutical, food, and aerospace industries.

"We have heavily invested in the latest manufacturing processes to maintain control over the quality of our products. We are not only a sealing company, but provide our customers with technical innovations and site services to help them become more efficient. We ensure that our customers receive a high level of service and are proud to successfully produce our products in the British Isles".

Mick Foulds, Managing Director, KLINGER UK Limited.

## PRODUCTS SERVICES **SOLUTIONS**

#### A global leader in innovation

#### **KLINGER Integrity Services**

We offer a wide range of products and services uniquely tailored for your industry. Our Total Integrity Solutions approach means that we can provide a complete range of self-delivered services to suit your application. From Gasket Design and Manufacturing, through to a full range of On-site Field Engineering Services, we offer a complete product-to service solution. We use the latest cutting-edge service technology and will work with our client's side-by-side, offering a highly collaborative approach to deliver innovative and safer solutions, with a leak-free guarantee and right first-time start-up.

#### **Global Supplier Local Partner**

We pride ourselves on being able to deliver the best possible products and services to our customers. With seven customer contact centers spanning across the UK, we can provide our customers with quality products, and a quick turnaround service.



#### Current customers include:





SAMSUNG













HYUNDAI















# 2,400

employees

2,400 employees work for the KLINGER Group worldwide



## €520m

## annual sales

580 million euros were generated by the KLINGER Group in finacial year 2019



production sites



countries of the world to which the Group has already exported



countries worldwide hosting subsidiaries or a representative of the KLINGER Group





## SPIRAL WOUND **GASKETS**

#### **MAXIFLEX**

- » High integrity seal for use with virtually all media dependent upon style and filler material
- » Spiral wound gaskets provide a safe and high integrity seal in applications where the factors that determines its sealing ability fluctuate. These factors may be the temperature, pressure, flange rotation, bolt stress or creep
- » The sealing element is made up of a preformed metallic winding strip interleaved with a soft filler. When compressed, the filler densifies, fills the surface finish of the flange, whilst the metallic strip provides mechanical resistance
- » Available in a wide range of material combinations to suit applications
- » Exceeds the performance criteria of the latest ASME B16.20
- » KLINGER Maxiflex spiral wound gaskets are fire safe to API 6FB



Filler Material	Maximum Temperature
Graphite	500°C (application dependant)
PTFE	260°C
Mica	1000°C
Mica & Graphite, Zonal	900°C

## **RING TYPE JOINTS**

- » KLINGER Ring Type Joints (RTJ's) are heavy duty, precision manufactured metallic seals used in Offshore and Petrochemical industries
- » Manufactured in accordance to ASME B16.20. API 6A or API 17D
- » Fire Safe
- » Available in a variety of metallurgies, dependent upon the application
- » Available styles R Oval and Octagonal, RX and BX
- » Rated from class 150 through to API 20,000



## **MAXIPROFILE KAMMPROFILE GASKET**

- » High integrity seal originally suited to problematic
- » Solid metallic core with concentric serrations providing localized high pressure points
- » Soft facing flows into imperfections on flange surface and provides sealing at low seating stresses
- » API 6FB Fire Safe with graphite or Mica facing
- » Configurable to non standard / damaged / mis-matched flanges
- » Available in wide range of metallurgy cores

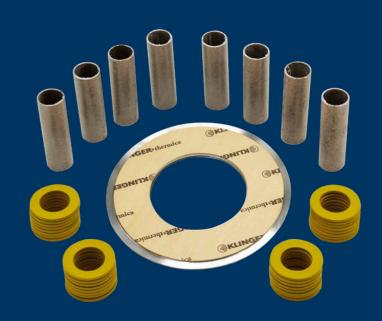


Facing Material Options	Maximum Temperature
Graphite	500°C (application dependant)
PTFE	260°C
Mica	1000°C
KLINGERSIL C-4430	250°C

## **INSULATION** SETS / KLINGER **SHIELD**

#### **General Properties**

- » Cathodic Isolation
- » Mitigate against galvanic corrosion
- » High Integrity sealing solution
- » Fire Safe to API 6FB
- » Trusted materials including KLINGERSIL, Top-chem, and Thermica
- » RF and RTJ flange options







KLINGER UK is also the major distributor of GPT products.









## SENTRY REVERSE **INTEGRITY GASKETS**

#### Maximise plant up time / Reduce emissions / Increase efficiency

- » Save up to \$1m on shut down / pit stop costs
- » Allows leak testing on individual flanged joints without the need to pressurise the full system
- » Speeds up the leakage testing reducing plant downtime
- » Significantly reduces the volume of testing media
- » Validates individual joint integrity at installation reducing the need to re-visit the joint
- » Suitable for all ASME B16.5, B16.47, API and PN flanges, Class 150-2500, API 5K-20K

\*References available on request



#### **SENTRY RTJ**

Reverse Integrity Gaskets for ring joint flanges



#### **SENTRY IK**

Reverse Integrity Gaskets for cathodic protection



#### **SENTRY DS**

Reverse Integrity Gaskets for raised face flanges



#### **SENTRY SR**

Reverse Integrity Gaskets for clamped connections

#### SENTRY REVERSE INTEGRITY TRAINING



#### INTRODUCTION

- » From development and testing, design concept through to application opportunities
- » Understanding the limitations of the traditional method of testing bolted joint integrity



#### **INSTALLATION**

» How to install and why a competent installation is necessary when assembling a bolted joint



#### **TESTING**

- » SENTRY connections
- » Test pump operation
- » Queries, possible failure points and rectification methods



## **ECO-SEAL LOW EMISSIONS GASKET**

### Reduce your plant's fugitive emissions with our emissions reduction programme

Eco-Seal is an ultra-low emissions spiral wound gasket. Manufactured in accordance with ASME B16.20-2017 it has been designed to provide a tighter seal compared to standard spiral wound gaskets. The concept behind Eco-Seal is not just a tighter gasket, its being able to quantify a reduction in plant emissions. We can provide you with data that you can understand and can relate to.

#### Features:

- » High density construction resulting in increased mechanical stability
- » Modified winding strip form

#### For even the most demanding applications:

- » Hydrocarbon
- » Steam
- » Chemical
- » Petrochemical
- » Power

#### Construction:

- » 316L
- » High purity graphite filler

#### Standards:

- » ASME B16.20-2017
- » Fire Safe to API 6FB
- » NACE MR0175

#### Gasket factors

- » M3
- » Y 10.000 PSI



## **CORROSION CONTROL**

#### SAFEGUARD CORROSION CONTROL GASKET

The Safeguard has been developed by KLINGER as a solution to sealing corroded flanges which are particularly evident in the offshore environment. Simple to install, the Safeguard limits further corrosion and provides a safe and efficient sealing solution and enables users to plan for necessary flange face repair.

Features & Benefits:

- » Fire safe to API 6FB
- » Continuous service up to 260°C
- » Suitable for RTJ, RF, mismatched RTJ to RF and dissimilar metallurgy flange connections
- » Suitable for sizes 1/2"-24" and pressure classes 150-2500
- » Fire Safe primary seal combined with biaxially orientated, structurally modified PTFE that conforms to pitting \*



\*Range of metallurgies available, contact KLINGER for acceptance criteria.

#### **FLANGE MACHINING**

KLINGER understands machining of a flange face is always the firstchoice remedial action, where it is permissible to machine the flange face. KLINGER integrity services' dedicated machining team can solve all on-site problems. With extensive experience, a proven industry record and the most advanced equipment, we provide a fast, comprehensive, and safe service.

Capabilities Include:

- » Weld repair
- » RTJ machining
- » Hub re-machining
- » Full exchanger machining service



#### KLINGER MAXIFLEX PRO-X

The Maxiflex Pro-X has been designed to offer a standard spiral wound-style gasket that has been specifically engineered to prevent the ingress of potentially corrosive media into the flange sealing area.

By combining Mica and Graphite in the sealing element we provide a safe, tight, and long-term solution to Hydrocarbon based industries and those exposed to saltwater.









The proactive element of the Pro-X

is engineered through the inclusion

Features & Benefits:

- » Fire safe to API 6FB
- » Designed to ASME B16.20 2017
- » Standard Construction: 316SS winding strip / MGM filler / 316L KAMM INNER / PTFE Facing



\*Range of metallurgies available, contact KLINGER for acceptance criteria.

## 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



## SOFT CUT GASKETS/ SHEETING

#### **KLINGERSIL**

The original Non Asbestos sheeting material, KLINGERSIL is trusted globally and the 1st choice calendared sheeting in a range of industries.

KLINGERSIL materials are manufactured with KLINGER's unparalleled levels of quality control to meet our high specifications. KLINGERSIL sheet materials are easy to cut, handle and fit, and are produced with our 3xA finish.









KLINGERSIL C-4430, C-4400, C-4324, C-4509. Available in sheet and cut gaskets.

#### **EXFOLIATED GRAPHITE LAMINATES**

Exfoliated Graphite Laminates can be supplied either with or without reinforcement 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

#### **PSM-AS**







# Pure exfoliated graphite with a tanged stainless steel sheet reinforcement for improved blowout resistance and ease of handling. Due to the excellent chemical and thermal capabilities of graphite it is used extensively throughout the petrochemical and chemical industries for process duties and steam applications.



## **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

#### 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.

## KLINGER TOP-CHEM PTFE RANGE

Products from the KLINGER®
TOP-CHEM range are tailored to
provide the characteristics required
by their target industries. Amongst
others, this includes tightness even
at low surface pressures, high
resistance against strong acids or
strong alkaline solutions as well as
good properties at medium and low
temperatures.

#### **General Properties**

- » Easy handling» No embrittlement
- » No aging reaction
- » Weldable
- » No sticking on flanges

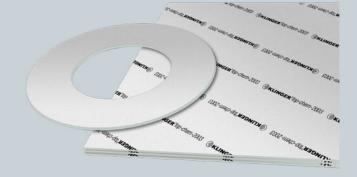
#### Broad application coverage:

- » Temperature ranges from -200°C up to +260°C
- » Excellent chemical resistance in strongly acidic and alkaline applications
- » Used in the pharma industry, food industry, chemical industry, energy sector, in oxygen pipelines etc.



Leading mechanical stability with Top-Chem-2000:

- » Long service life because of high stress retention
- » High residual stress
- » TOP-CHEM 2000 has the lowest creep on the market



Top-Chem-2003:

- » Glass Micro-sphere filler
- » Highly compressible
- Outstanding chemical resistance

## INDUSTRIAL VALVES

KLINGER is your partner for the development, manufacture, and sale of high-quality industrial valves, used every day in a wide range of fields — from district heating to LNG, through to the chemical and the oil & gas industry. Our industrial valve products are 'trusted worldwide' because of their high reliability, long life cycle, and extremely low total cost of ownership.

Our valve specialists recommend, source, and deliver all types including pneumatic, electric, or hydraulic actuated packages and control valves, providing a complete valve package service.

MONOLITH KHO BALL VALVES

#### BALLOSTAR® KHI BALL VALVES



## **BALLOSTAR® KHE BALL VALVES**



#### **KVN PISTON VALVES**





#### MONOBALL® KHM BALL VALVES BALLOSTAR® KHA BALL VALVES





## **EXPANSION JOINTS & HOSES**

Metal expansion joints are engineered components designed to absorb pipeline movements. KLINGER manufactures a range of expansion joints and hoses, some of the products in the range include:

#### **WELD END EXPANSION JOINTS**

Weld end expansion joints are equipped with carbon steel or stainless-steel pipe connections.











#### FLOATING FLANGED **EXPANSION JOINTS**

Floating flanged expansion joints are equipped with carbon steel or stainlesssteel flanges (EN, ASME or as requested). It absorbs mainly axial movements with possibility of some lateral movements.









**FIXED FLANGED EXPANSION JOINTS** 

Fixed flanged expansion joints are equipped with welded carbon steel or stainless-steel flanges (EN, ASME or as requested). It absorbs mainly axial movements with possibility of some lateral movements.











#### **CENTRAL HEATING SYSTEM TYPE EXPANSION JOINTS**

Significant displacements due to thermal movements on central heating pipes create thermal stresses resulting in bending of pipes and irritating noise. To prevent these problems, Central Heating System Type Expansion Joints may be preferred to absorb these movements.









## **ASSOCIATED PRODUCTS**

KLINGER offers a high-quality portfolio of expansion joints and various types of metal hoses, compression packings, spray shields, and insulating gasket sets. Our comprehensive range of packings for centrifugal or reciprocating pumps and valves meet, and in most cases exceed the stringent fugitive emission targets set by various environmental bodies such as the EPA. Understanding the diverse requirements of operators around the world, our range includes standard designs as well as products specifically tailored to meet customer and industry-specific needs.



#### **LEVEL GAUGES**

As the inventors of the Level Gauge KLINGER have a proud history of manufacturing the complete range of level gauges and associated products.

- » Magnetic Level Gauges
- » Reflex Level Gauges
- » Transparent Level Gauges
- » Class 150–1500 flange rated
- » Temperature range -196Deg C 400Deg C
- » Sight Glasses
- » Gaskets

## SLIP / SPECTACLE PLATES AND BLANK FLANGES

- » Manufactured by KLINGER UK to standard or specific customer specification
- » API590 and B16.48
- » Range of metallurgy
- » Size range 1/2" to 80"
- » Raised face or Ring Type Joint



## HYDRAULIC SEALS / O-RINGS

- » O-Rings, Geopak Seals, Wiper Rings, Piston Seals, Wear Rings
- » Materials including Viton, Nitrile, HNBR, Neoprene, EPDM and Silicon
- » Lubricants
- » O-Ring fitting tools
- » Food and Pharmaceutical grades
- » Multiple Industry applications





## KLINGER TOPLINE GLAND PACKINGS

KLINGER Gland Packing and die-formed rings have been manufactured for over 100 years and are trusted worldwide.

- » A complete range of PTFE, Graphite, Synthetic and Hybrid packings
- » Available for Fire Safe, WRAS, FDA and BAM Approved applications
- » Outstanding resistance to Chemicals
- » Wide Temperature tolerance
- » Low Coefficient of friction



#### **STUD BOLTS**

KLINGER supply the petrochemical industry with many different types of bolting. From standard to bespoke stud bolts. Ranging from ½" 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.

## KLINGER INTEGRITY SERVICES

#### Collaborate Innovate Optimise

The success of The KLINGER Integrity Service team is built on a global model with over 100 years' onsite experience in gasketing, bolting, and on-site machining service. A complete engineered solution offering a leak-free guarantee and the right-first-time startup.

We will work with you side-by-side and offer a highly collaborative approach to deliver innovative and safer solutions, from gasket design and manufacturing, right through to installation, testing, and QA/QC verification.

We have thorough quality assurance, HSE, and governance processes in place, backed by a powerful flange management software (IntegrityXpert). This gives clients real-time access to information as well as sections on creating engineering work packs for integrity disciplines during Engineering, Construction, Commissioning, Plant start-up, Operations, and Maintenance scopes. IntegrityXpert provides valuable data for decision making and allows an organizations' key individuals such as management, operations, and maintenance people to remain fully informed of a facility's performance status.

Our experienced team of regulatory experts, project managers, engineers, technicians, and quality analysts enable us to deliver flexible operations and individualized solutions for each customer, regardless of a facility's size or complexity. We stay on top of emerging technologies, evaluating the effectiveness of new tools and finding ways to deliver value through solutions that produce tangible benefits in the form of reduced costs, greater efficiency and shorter timelines.



#### FLANGE MANAGEMENT

- » ASME PCC-1 and EN 1591/1 Design Calculations
- » Heat Exchanger Calculation Module
- » ATEX Handheld Tablet Zone 1 / Zone 2 & Div1 Hazardous Area



## ON-SITE MACHINING

» Onsite specialist machining solutions



#### **BOLTING**

- » Hydraulic Bolt Torquing & Tensioning
- » Ultrasonic Bolt monitoring» Hot Bolting of Live Assemblies
- » Safe Bolting Principles & Practice



## SITE SERVICES & TESTING

- Onsite specialist solutions for problematic assemblies
   CENTRY (Property Integrity Contents)
- » SENTRY (Reverse Integrity Gasket) Installation & Testing



QA/QC

» Onsite QA/QC Inspection



## TECHNICAL SERVICES

- » Pre-Engineering of client Critical Flanges
- » Client Joint Integrity procedure creation & review
- » ECITB, EN & ASME Joint Integrity Training» New product development
  - » Application-based product testing

## **INTEGRITY PROCESS**

#### Combined product and service



#### IDENTIFICATION OF INTEGRITY ANOMALIES

- Pre Shutdown Engineering Review
   QA/QC Team onsite for pre Inspection
- » Review and development of client site FM procedures



## INTEGRITY PROBLEM ANALYSIS

- » Onsite KLINGER Technical Authority as first point of contact
- » Quick integration with KLINGER Applications Team
- » Trending of known issues through KLINGER IntegrityXpert



## ENGINEERING SOLUTION

- » Combined specialist services offering sealing technology and onsite service expertise
- » A complete engineered solution with a leak free guarantee



#### SPECIALIST ONSITE APPLICATIONS

- Onsite Joint Integrity Services team install gaskets, assemble and tightening problematic flanges
   Specialist Onsite Machining
- capabilities for all onsite applications



#### CLIENT BENEFITS AND ADDED VALUE

- » Increased plant efficiency, reduction in downtime, measurable cost savings
- Reduction in the number of recorded HR's and an increase in Health & Safety standards
   Total Joint Integrity Assurance through
- verification offering "Zero Leak" start up
- » Reduction in fugitive emissions driving forward profitability

trusted. worldwide. 16 | 17

## **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.

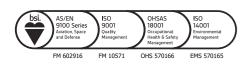
KLINGER can offer training packages ranging from bespoke sessions to fully accredited competency training certified by ECITB.

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

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

## » Increase best practice techniques

#### **Accreditations:**











## **DEDICATED PROJECT MANAGEMENT TEAM**

#### Trusted expertise for worldwide projects

KLINGER Projects team brings together multi-disciplines to ensure a focused one-team approach to your project. With the experience of supplying both Greenfield and Brownfield sites across the world, KLINGER Projects can support all stages of your project from Feasibility and FEED studies to commissioning, start-up, and handover. As a manufacturer and service provider KLINGER has worked with asset owners and EPC contractors ensuring a quality solution for all project requirements from small to megaprojects.

Our technical team is unrivaled, with gasket, valve, and instrumentation product specialists on hand to offer advice and recommend the most advanced solutions to meet EPC and project requirements.

Our team provides the following across all our products and services:

- » Engineering support and calculations
- » Flange Management solutions
- » Commercial support, scheduling, and pricing
- » Documentation Control
- » Quality Assurance & Certification
- » Onsite services and training
- » Logistics Support

KLINGER's global network of companies and partners means that we can supply ongoing support to the facility through local stock and service technicians.

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