



KLINGER Engineered Solutions

» Turnaround / Shutdown Solutions

» Integrity Services

» On-line Services

» Leak Risk Management



GLOBAL LEADER



LOCAL PARTNER



FULL TURNKEY MECHANICAL OFFERING INCORPORATING:

- » Mechanical maintenance
- » Joint integrity management QA/QC
- » On-site valve reconditioning
- » On-site gasket manufacturing and inventory control
- » On-site flange face machining

THE COST OF LEAKING JOINTS:
Loss of containment may have catastrophic results. They harm brand image, facilities, employees, and the environment. We at KLINGER emphatically believe that all bolted joint leaks can be avoided, and we drive our people, processes, and clients to achieve this goal.

ENGINEERING AND TECHNICAL CONSULTANCY
KLINGER assists with the development of a best practice Joint Integrity Program

- » In the preparation and planning of any construction or maintenance activity, we can assist with the development of a best practice Joint Integrity Program
- » This can include a JIP gap analysis, review, and development of procedures, and the implementation of a Flange Management System
- » Joint troubleshooting and engineering support as well as expert guidance on joint integrity-related issues

COMPLIANCE
We assure the correct processes, procedures, and standards are being met

- » On-site QA/QC compliance
- » During any on-site construction or maintenance activities, we perform a full QA/QC service of all joint integrity work
- » Our teams of specialist joint integrity personnel drive and monitor the implementation of the client's joint integrity program, ensuring compliance, and providing full traceability that the client's mandated procedures and standards have been met.

IN-SITU VALVE REFURBISHMENT - READY WHEREVER YOU ARE:

- » By bringing this service to you, we can offer a swift turnaround, cost efficiency, and minimise the impact on project scheduling and equipment
- » Reducing your downtime and maximising the efficiency of your shuts

Leading processors want their valve testing and repair services on-site and on-demand.

ON-SITE FACILITY INCLUDES

- » Test bench clamping system
- » Workstations for valves assembling/disassembling
- » Computer registration and certification system
- » Low/high-pressure air compressor station with storage system
- » Portable machines for grinding and lapping
- » Toolroom metal turning lathe with D.R.O
- » Jib crane (500KG)
- » Electrical installation
- » All necessary accessories
- » Documentation cupboards
- » Office desk / small workbench
- » Large tool/components storage shelves

KLINGER is one of the only companies in the region offering specialist component integrity and leak detection and repair (LDAR) capabilities.

KLINGER TECHNOLOGIES
KLINGER deploys a range of cutting-edge technologies and data systems as part of the service to our clients

- » Optical Gas Imaging (OGI)
- » Fast-response Flame Ionization Detection (FID)
- » Thermography
- » Data capture systems
- » Secure online data management and reporting



SHUTDOWN/PROJECT MANAGEMENT
Incorporating a 5-phase management system:

- » Preparation and planning
- » Detailed planning
- » Pre-Shut preparation
- » Turnaround execution
- » Start-up handover



A ONE-STOP SINGLE-SOURCE SOLUTION FOR YOUR NEXT PROJECT OR SHUTDOWN

- » Eliminates all hassles of dealing with multiple contractors
- » Single source responsibility
- » One point of contact for a turnkey solution
- » Saving in cost and time

EXECUTION
We provide skilled personnel and state-of-the-art equipment for flange management activities

- » On-site execution: Services
- » We supply skilled field services personnel to directly execute any controlled bolting, on-site flange machining, on-line leak sealing, and on-site QA/QC of all flange management.



VALUE ADD

- » Assets remain on location
- » Elimination of the potential for miscommunication
- » Reduction in time required for turnaround/shutdown servicing
- » Eliminating the potential for damages sustained during shipping
- » Increased control
- » Increased efficiency

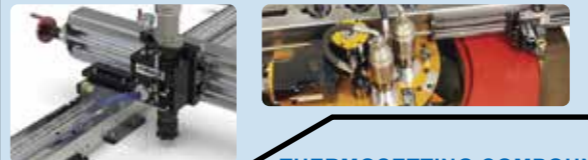


KLINGERS' On-Site Machining Service is geared to provide the industry with fast, economical solutions to in-situ maintenance.

FLANGE FACING FEATURES

- » Precise, robust, compact, and portable
- » Internally and Externally mounted machines, operate in any orientation
- » Standard and compact flange facing, "O" ring grooves, RTJ and V grooves, weld preparation, etc.
- » On Site Machines achieve surface finishes from 6.3mm Ra to 1.6mm Ra

MILLING
On-site 3-Axis Milling machine complements the flange facing machines, whereby division plates in heat exchangers can be milled to ensure a uniform finish. The milling machine is also suitable for the milling of O-ring grooves, crane pedestals, heat exchanger repair, motor and pump mounting pads, steel mill housing and turbine split line machining.



THERMOSETTING COMPOUNDS
Our exclusive use of the TEAM INC. range of compounds is specifically purposed to suit specific temperatures, pressure, and service. Compounds are injected into live leaking components or used in conjunction with a KLINGER custom repair enclosure to encapsulate and seal the leaking component. All compounds are developed and manufactured in-house under the strictest quality control processes. Compounds are tested for suitability and compatibility with all mediums of use and documented in our ChemCheck data book.



HOT TAPPING EQUIPMENT SUPPLY
We offer the design, engineering, and manufacture of a full range of TEAM INC. hot tapping and line-stopping fittings, equipment, and accessories.

KLINGER IS THE SOLE AGENT FOR AFRICA

The CTI Shield/Seal™ is a thin-walled metallic tube insert, made of highly durable alloys, from copper-based alloys to stainless steel and nickel-based alloys.

Available Materials also include alloys for high-temperature service.

The Shield/Seal™, besides repairing tube end erosion/corrosion, will restore tube-to-tube sheet hole integrity, permit proper mechanical tube cleaning, and in many cases restore leaking, plugged tubes to full operation. Once expanded, the shields then become integral with the parent tubes.

Under pressure LEAK SEALING, keeping critical piping and pressure equipment on-line, therefore maximizing Asset Uptime.

- » Facility integrity threats such as leaks or wall thinning can be extremely costly to operators if left unresolved.
- » KLINGER's on-line leak sealing and mechanical repair team are available 24/7, adding value to customer operations by maximising the availability of critical equipment, reducing steam-raising costs, minimising environmental emissions, and enhancing safety.
- » At KLINGER, we pride ourselves on being able to deal with any integrity threat from the most routine valve-packing leak to the most complex high-pressure, hydrocarbon-piping repair.
- » We do so with industry-leading safety, responsiveness, and compliance. All damage mechanisms and leak sources are repaired by our local technicians with the added insight and support of our global engineering group TEAM INC.
- » Our association with TEAM INC. is unique as the process was developed by them and have spent nearly 100 years perfecting it. We've handled just about every imaginable leak-sealing application – safely and successfully.

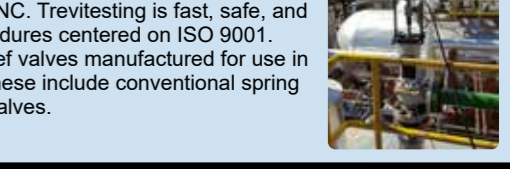


IN-HOUSE DESIGN AND FABRICATION OF ALL PRESSURE ENCLOSURES
All designs are conducted by Professional Engineers and approved by appointed 3rd party AIA and verified by Design Verification Engineers (DVE) as stipulated in SANS 347.

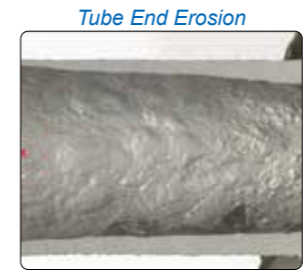
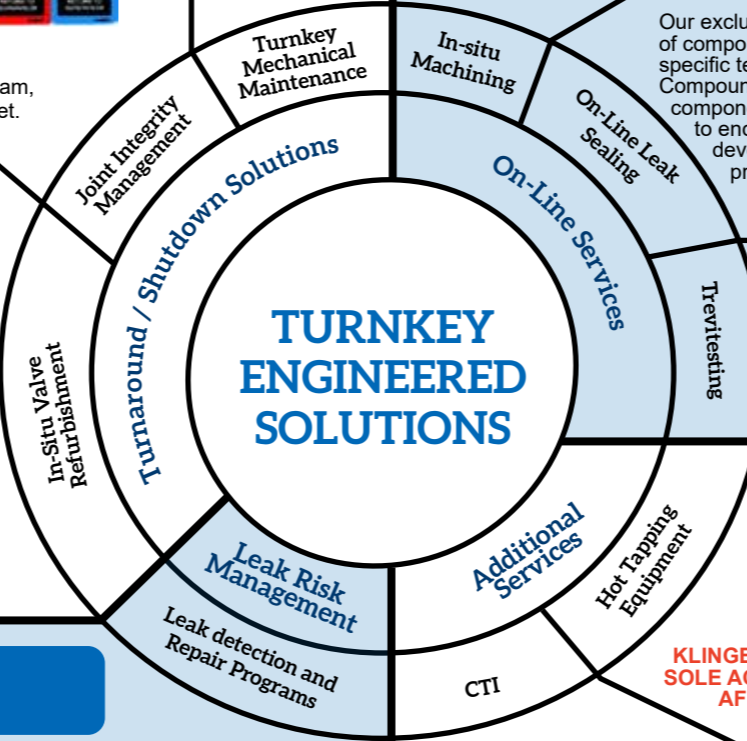


TREVITESTING is the hot testing of valves while operations continue, as well as the cold testing of valves on-site and in the workshop. Trevitesting will increase efficiency and save your organisation money from day one.

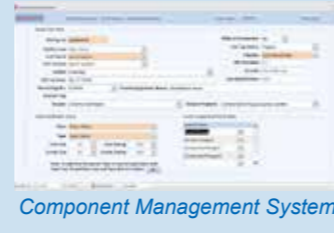
The result is a certified test allowing correctly performing valves to remain in service for longer periods, as well as fully documenting valves that do not meet the correct performance criteria, by our experienced personnel, so that they can be repaired or replaced as soon as possible.



Developed and patented worldwide by TEAM INC. Trevitesting is fast, safe, and efficient. Operated following strict control procedures centered on ISO 9001. Trevitesting can be used with most safety and relief valves manufactured for use in steam, air, gas process, and water systems. These include conventional spring valves, torsion bar valves, and pilot-operated valves.



CTI Shield/Seals™ installed in new Waste Heat boiler tubes





KLINGER
Engineered
Solutions



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THE 8 ABSOLUTE ESSENTIALS OF ASSURED JOINT INTEGRITY MANAGEMENT

1) OWNERSHIP

A Joint Integrity Program (JIP) "owner" within the organisation must be appointed. The chosen individual, designated as a subject matter expert (SME), supports the entire strategy of the JIP and becomes the linkage to external and internal parties.

3) ASSESS CRITICALLY & SET RULES

Based on this risk analysis, the type of bolting and inspection procedures is determined for each level of risk. For high-risk joints, a dedicated contractor that specialises in bolting might be required. For low-risk joints, the facility's own general technicians may be sufficient, provided they meet the ASME standards as "Qualified Bolting Specialists".

5) JOINT IDENTIFICATION & TAGGING

The identification and tagging program should be as efficient as possible and already in place. This process is critical to ensure that technicians are aware of which bolted joint is currently under work and into which level of risk the equipment is categorised.

7) INSPECTION & COMPLIANCE

Inspection of bolted joints is an integral activity to ensure the continued integrity of the joints and, as such, should be included in every inspection program, i.e., 'you get what you inspect, not what you expect'. This area of a JIP assurance, looks at the possible flange damage that can occur, the inspection methods available for detection of defects, and mitigation measures that can be put into place to minimize effects due to degradation and improper assembly. Operators should ensure that QA/QC personnel are well-trained and well-versed in the fundamentals of bolting so they can support the craft, execute tasks effectively, and recognize any deviations to mandated procedures during the QC/QC process.

2) INDUSTRY BEST PRACTICES & PROCEDURES

The organisation should seek, identify, and benchmark against best practices and guidelines in the industry. The best practices should be applied within the organisation's JIP processes, procedures, and documentation. Often, these best practices and procedures can be acquired from joint integrity service companies.

4) TRAINING & COMPETENCY MANAGEMENT

This area is concerned with ensuring that technicians working with bolted joints are sufficiently trained, experienced, and qualified to work within each level of risk. Training programs should contain content relevant to the organisation's needs and should require at least six months of training and practical experience to be classified as a Qualified Bolting Specialist based on compliance to ASME PCC-1-2019 Appendix A.

6) COMPREHENSIVE DATA TRACKING

Various types of data are recorded in the data-tracking program. The tracking system covers the traceability of the technician that performed a job, the materials that were used, and the procedures that were followed. Data tracking can also extend to include the development of a Flange Data Management System (FDMS).

8) KPI, ANALYSIS & IMPROVEMENT

Analysis and key performance indicators (KPIs) of leakage and inspection data, coupled with formal reviews of the management system, should occur at agreed intervals by the owner and users. The results obtained from commissioning, incident analysis, and in-service inspections should be used to generate ideas for continuous improvement. Easily monitored but meaningful performance standards should be put in place at the launch of the process to quantify the contributions being made by the management system and evaluate user satisfaction. Feedback on good practices in integrity issues and causes or solutions to incidents should be provided both internally and to the industry to contribute to industry-wide continuous improvement.

As subject matter experts, let us take care of your joint integrity management while you spend time on your core business.



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