KLINGER

The Steam Issue

KLINGER News 10/2012

www.klinger-international.com

Connect with quality

Dimmen Tanis (right), Superintendent Maintenance & Reliability of ADM Europoort BV, discussing the inspection protocol with Hans van Noord, Sales Engineer of KLINGER B.V.

ADM Europoort BV enjoys a quick return on investment from steam system optimisation

Steam is an expensive energy carrier, so there are a number of reasons for keeping a steam system in optimal condition.

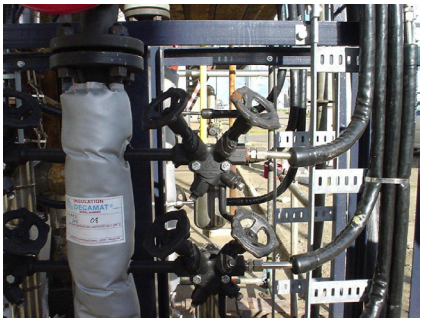
Optimising the steam system in close cooperation with KLINGER B.V. and switching to a new maintenance system allowed ADM Europoort BV to start saving some 200,000 euros a year on energy costs concerning its steam production. Dimmen Tanis, Head of the Technical Department at ADM Europoort BV, and Hans van Noord, Sales Engineer at KLINGER BV in Rotterdam explain how this was achieved.

With around 800 personnel members, ADM (Archer Daniels Midland Company) is the most important processor of cocoa and oil seeds in the Netherlands.

High steam consumption

Dimmen Tanis explains why steam plays such an important part in ADM Europoort's production processes. "At this location we mainly produce soya and rapeseed oil. Rapeseed contains 50 % oil and soya some 20 %. After we extract the oil from the seeds we are left with 'meal' that we sell to the animal feed industry. To extract the oil, we first cut the beans into small pieces, they are crushed, and hot hexane is poured over them. The heat-exchangers to heat the hexane are powered by steam. The oil dissolves in the hexane leaving the meal behind before we extract the oil from the hexane."

The production process for rapeseed is somewhat different: "Rapeseed is harder and smaller than soya and, as mentioned, the oil content is also considerably higher. Rapeseed is first crushed, then heated (where steam is also the energy carrier) and pressed before we extract the remaining oil. We produce the steam and electrical power in a boiler house and a turbine installation respectively, while also dispose of an efficient waste water purification installation.", Tanis explains.



An Armstrong steam trap, made of polished stainless steel, mounted on a condensate collection steam manifold. The insulation blanket ensures reduction of the heat and energy losses.

Limiting energy losses

ADM uses much energy and particularly much heat, with steam being the most important energy carrier. An extensive piping system for steam distribution with many steam traps straddles the whole site. These traps have the main purpose of collecting the condensate and returning it as quickly and at the highest possible temperature to the boiler house.

Hans van Noord from KLINGER explains: "When the condensate leaks away and disappears into the sewer you are in fact throwing energy away in the form of heat. You are also losing chemically treated water. To replace the leaked condensate you must again purchase and demineralise water with all the associated extra costs. Using sufficient steam traps is important for a number of reasons.

First, they take the water out of the piping system. You do not want water in a steam system because this can lead to 'water shock'. The difference in flow speed between steam and water causes the water in the piping to dam up and water shocks in the piping that can be heard as a sort of bang. Piping can then crack and valves can be spontaneously destroyed. This is highly undesirable, so the steam system at ADM is provided with approximately 270 steam traps of KLINGER B.V.

Besides the prevention of water shocks, steam traps also have an important money- and energy-saving function. In practice, condensation water and steam have a temperature higher than 100 °C.

If this leaks away because the steam trap is no longer working properly, energy and money are obviously lost.“

From corrective to preventive

In 2007 Dimmen Tanis was appointed Head of the Technical Department at ADM Europoort. One of his first feats was to set up a new maintenance system.

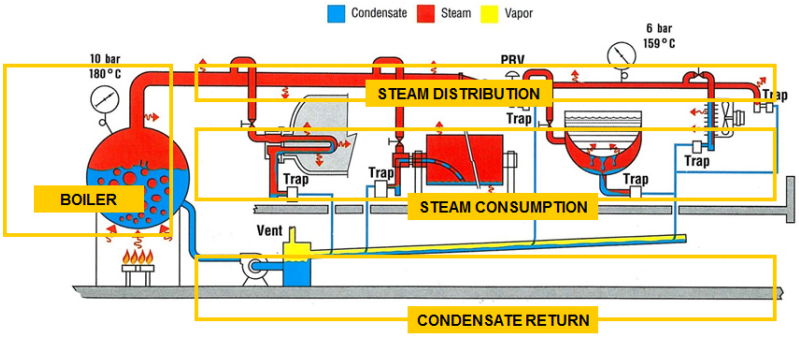
“At the time ‘breakdown maintenance’ or corrective maintenance was still mainly deployed” explains Tanis. “One waited until something became defective and only then acted.”

To have more control over both the installations and the maintenance process, acquisitions have been made, including the Maximo program to record all assets (systems, components and installations).

“As a result, we obtained a detailed overview of everything present at the plant. Then all 270 steam traps as part of the sizeable steam system also became ‘visible’.”, says Tanis.
“Using the Maximo system we drew up a preventive maintenance schedule, and at a given time gave KLINGER the assignment to inspect all steam traps and give advice on any action to be taken. The conclusion after the first thorough control a few years ago was that many of the steam traps did not appear to be functioning as they should.

KLINGER had calculated that their replacement would yield savings of €260,000 a year. These costs were made because cold water to compensate for the leaked hot condensate had to be supplied.

An experienced KLINGER steam technician thoroughly checking the overall performance of an inverted bucket by using ultrasonic and thermal equipment.



Schematic representation of a steam system (Armstrong Service report)

Monitoring

“We use steam at a maximum pressure of 80 bar and at temperatures between 140 and 295 °C, so if something starts leaking somewhere you see it straight away.” says Tanis.

“But companies using considerably higher steam pressures will have to take specific measures to detect leaks. We use these detection means too, particularly to limit energy losses, but at higher pressures this is obviously also important for safety reasons. Steam at 80 bar and a high temperature is a dangerous medium. You do not see leaks then.

At present, we are continuously measuring the steam flows so we can make a comparison with the reduced quantities in production. If differences occur, this can be evidence of leaks and we carry out more detailed inspections. It is also convenient that the reports KLINGER draws up for us are also available on a part of the KLINGER (Armstrong) website only accessible to us. We print the report and carry out a so-called ‘walk through’, with each steam trap marked in the report being visually inspected with a decision about what has to be done. We pass this on our contractor who carries out the work required.

Besides energy savings there are other reasons for having the experts from KLINGER assess the status of your steam installation. There appeared to be a steam trap with overflow in a space where production staff was at work. Should for whatever reason 60 bar steam suddenly be blown into the space, according to calculations by KLINGER the space would be filled with steam in 20 seconds so you would no longer be able to see anything. On the advice of KLINGER the steam trap was immediately moved to a location outside the space.”

Optimisation

“There are practically always leaks in the form of steam and/or condensation water,” says Hans van Noord finally. ”At higher pressures and temperatures it is also important to check the system for leaks for safety reasons. This can be done by fitting sensors in critical places such as next to steam traps.

For this, we have the so-called AIM system from KLINGER/Armstrong in the program (Armstrong Intelligent Monitoring) that immediately detects steam leaks. And then we have SteamStar. This is a web-based platform developed by KLINGER/Armstrong to register, control and follow up all data concerning a steam installation. SteamStar calculates losses, generates reports and can be used as an analysis tool, with the result that the efficiency of the steam installation can be optimised.

‘Letting off a little steam’ is fine, but remember that it can be a costly affair.”

For further information about KLINGER B.V. please visit www.klinger.nl. ■

TECNOFLOW and SINGER VALVE held a seminar at the Embassy of Canada

Anti-cavitation valve

KLINGER Argentina regularly holds courses and seminars organised by TECNOFLOW, its Water and Waste Water Division. These events are aimed at consultant engineers, water distribution companies and governmental water institutions throughout the country.

In July 2012, a seminar on hydraulic control valves for water networks and aqueducts was held at the Canadian Embassy in Buenos Aires with the cooperation of SINGER VALVE.

SINGER VALVE, a Canadian company leading in the manufacturing of control valves around the world, is now represented exclusively by Tecnoflow in Argentina.

The Embassy`s conference room was packed with engineers from all over the country.
During the seminar several new technical advantages were presented to the audience.

The rolling diaphragm allows the valve to operate with ultra-low flow rates.
The anti-cavitation cage is a unique feature that allows pressure reducing valves to operate with very high differential pressures without affecting their life time.
Anti-cavitation valve

Other special features presented at this event were pressure-reducing valves operated by more than one control pilot and remotely controlled via SCADA systems and electronic control valves.
Both models are especially designed to minimise water losses in water distribution networks.

For further information about Rich. KLINGER S.A.A.C.I.yF. please visit www.rklinger.com.ar. ■

Control valve with electronic actuador

KLINGERSIL C-4430 plus

RICH. KLINGER DICHTUNGSTECHNIK GmbH & Co KG, Austria

The gasket material with four PLUS on safety

KLINGERSIL® C-4430 plus is a universal sealing material, suitable for a large number of fluids. As KLINGERSIL® C-4430 plus is compatible with water, steam, hydrocarbons, oil, light acids and light bases, it is ideal for a wide range of applications.

The most important feature of the new KLINGERSIL® C-4430 plus is its high temperature heat resistant NBR matrix, which is used as binder.
This new technology has been used the first time for KLINGER®Quantum. It provides scope for improvements of several key characteristics, which have all been verified in numerous standardised tests:

Thermal stability

KLINGERSIL® C-4430 plus benefits from the new cross-link technology and features now a considerably higher stability. This results in the greatest heat resistance ever. The maximum temperature is 50 °C higher than those of other materials, and allows higher process temperatures.

Life time

Normally, elastomers used for sealing materials deteriorate over time.
Periodical replacement is absolutely essential to sustain safe operation.
But the extended lifetime of KLINGERSIL® C-4430 plus, on the other hand, makes longer service intervals and reduced service costs possible.

Safety

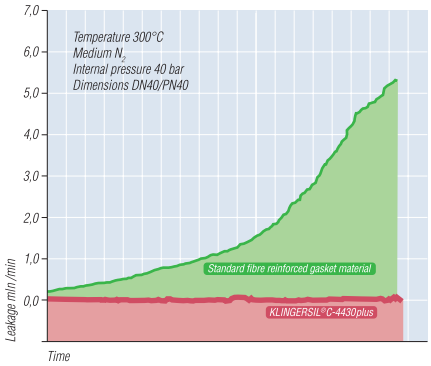
Better seal performance in every situation increases the leakage resistance. The probability of blowouts is significantly reduced.

High temperature tightness

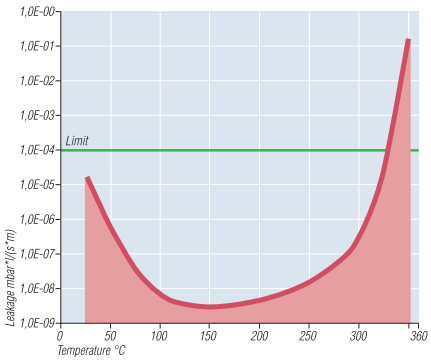
The demands of our customers regarding leak tightness, and new statutory rules (e.g.: “Richtlinie 96/61/EG des Rates über die integrierte Vermeidung und Verminderung der Umweltverschmutzung/IPPC directive”, “Bundes-Immissionsschutzgesetz Deutschland”, “Technische Anleitung zur Reinhaltung der Luft”, VDI 2290 Emission control/ Sealing constants for flange connections) are continuously increasing.
But thanks to the high temperature heat resistance, KLINGERSIL® C-4430 plus is suitable for even very demanding situations.

Due to the compatibility with numerous fluids and the large number of approvals (e.g. for drinking water, DVGW, Firesafe, according to „TA-Luft“), KLINGERSIL® C-4430 plus covers a wide range of applications.

For further information about KLINGERSIL® C-4430 plus please visit www.klinger.co.at. ■



High temperature tightness



Tightness acc. to VDI 2440

Siemens VAI Uses Gebetsroither Equipment for Plant in USA

Siemens VAI is relying on KLINGER Gebetsroither as its partner in the construction of the world's most powerful hot strip mill.

Siemens VAI Metals Technologies will provide a complete, integrated wide strip mill on a process turnkey basis for Allegheny Technologies Incorporated (ATI).

The new plant is part of a new, modern hot strip mill for special milled products and will be built by ATI Allegheny Ludlum in Brackenridge, Pennsylvania, USA. It will be able to mill a wide range of corrosion-free steels and special alloys in widths of more than 2,000 millimetres. The milling forces will be the highest ever achieved in a wide strip mill. Numerous technology packages in the delivery scope will ensure the high technical standards are met.

To meet the challenging demands of the customers and the plant, Siemens VAI has turned to KLINGER Gebetsroither as a professional and reliable supplier of valves. KLINGER Gebetsroither has provided Siemens VAI with a broad spectrum of open-close valves for years (both manual and automated), for media such as oxygen, argon, nitrogen and cooling water. The components delivered were and will be integrated in the systems in the area of steel production.

Thanks to the good reputation of KLINGER with Siemens VAI, KLINGER is a preferred provider in other areas such as roller mills.

A special challenge was posed in this project by the customer's unique requirements. The prerequisite was that none of the parts delivered could come from China. This limited the number of suppliers significantly.

The need for butterfly valves for this plant was satisfied with CONVEY CONAXE high-performance valves and concentric central flange-mounted valves (European product), covered accordingly by KLINGER GEBETSROITHER.

To meet the demanding requirements, a total of 16 units of CONAXE in 4" to 20" per ANSI and more than 300 units of central flange-mounted valves from 4" to 16" per ANSI were provided. The high-performance valves were equipped with gearboxes and the centric Lug Type valves with pneumatic double-action drives, magnetic valves and limit switch boxes.

For the manually operated valves, a locking system was developed that CONVEY was able to easily implement.

A further requirement for this order was the fact that based on the delivery delays from the suppliers, the project had to be completed within a very short period of time. For instance, all drive units were installed in only two weeks, including 100 % functional inspection, and packing of all valves by KLINGER Gebetsroither.

Finally, this order could be completed successfully and to the customer's full satisfaction thanks to excellent teamwork, which lets us hope for follow-on orders.

For further information about KLINGER Gebetsroither GmbH & CoKG please visit www.gebetsroither.at. ■

BLUEcoMPETENCE
Alliance Member

KLINGER GmbH – Alliance Member of the VDMA sustainability initiative „Blue Competence"

Sustainability is essential – for the economy, ecology and society. But what is achievable? And above all, in which way? The mechanical engineering industry provides answers - with innovative solutions and the Blue Competence sustainability initiative.

Responsibility is the driving force and thus the backbone of sustainability. Accordingly, responsibility for sustainability is also the basic value and the guideline for Blue Competence.
KLINGER is aware of this responsibility, therefore KLINGER GmbH is an Alliance Member of Blue Competence.

Sustainability encompasses balancing and integrating economic, ecological and social aims. Therefore, it deals with responsibility in a wider sense, for instance for wealth, education and security, the natural world and the economic consequences of globalisation, structural change or demographic trends.

The term sustainability itself often evokes basic expectations, requirements and hopes – for example in relation to new energy concepts, how to handle scarce resources or protect the environment in an effective way. But who takes responsibility for promoting sustainability in its many facets? And who has the potential to develop and offer practical solutions which are ready for the market?

Mechanical and plant engineering companies not only feel an obligation to do this, but they are in fact also the driving force and engine behind pioneering technologies which allow for many sustainability ideas to actually get off the ground. However, sustainable production processes and products are not always obvious at first glance.

This is why Blue Competence defines credible and resilient sustainability criteria and standards that all those who join the initiative must meet.

Acting sustainably does not mean having to abandon a high standard of living – quite the contrary. Apart from the fact that we benefit from the responsible use of energy or resources, sustainability always has a social dimension.

One-sided considerations of environmental protection, profitability or political questions are only seldomly meaningful. Sustainable solutions are based on the integration and coordination of interests. Thus ensuring and enhancing our quality of life over the long term, requires taking all aspects into account and particularly thinking about all of humanity.

In the future, we will be confronted with a higher life expectancy and the consequences of the ever increasing average age of the population, above all major cities, which attract an increasing number of people and grow into mega-cities of completely new dimensions.

These are just a few examples of the many challenges, which directly affect our quality of life and which we must master – with concrete, technical solutions such as innovative technology for water supply and water treatment or for modern agriculture.

As a member of Blue Competence, KLINGER GmbH is bound to implement sustainable ideas, develop solutions and achieve objectives. Together with members coming from a great variety of industries, we create products as well as production processes in order to make it possible for all of us to act in a sustainable way – economically as well as ecologically.

Blue Competence is supported by the German Mechanical and Plant Engineering Federation (VDMA).

Information about Blue Competence Initiative and VDMA:
www.bluecompetence.net
www.vdma.org

For further information about KLINGER GmbH please visit www.klinger.de. ■

INTEC K200-S-STD-EC: Ball valve with bellow-sealed stem

This ball valve with bellow-sealed stem sealing is the first ball valve which actually seals the stem by means of metallic bellows.

Main features:
- safe sealing to atmosphere with bellow
- stem sealing design: secured against torsion, multiple wall bellows and additional safety stuffing box
- permanently tight
- leakage rate to the outside: min. $1x10^{-6}$ [mbar • l/s]
- application for particular toxic, aggressive, flammable, volatile and valuable media under consideration of the material resistance

Field of application:

Nominal size:	DN15 up to DN150
Design pressure:	PN16 up to PN40
Temp. range:	-196 °C up to +220 °C

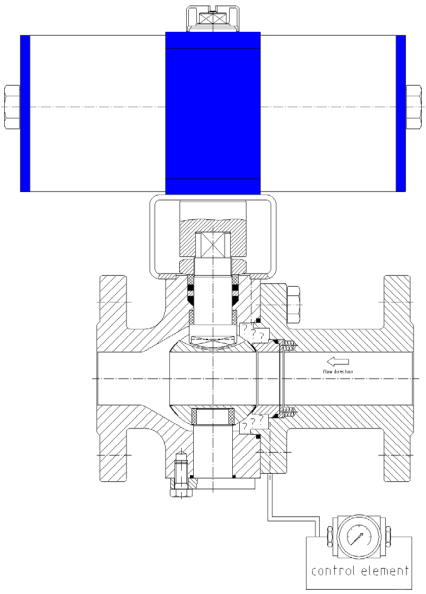
Ball valve "Easy Move": seat pressure release system INTEC K231-S-HT-EM

The seat pressure release system "Easy Move" enables a strongly reduced torque, wear-free and friction-free switching of ball valves, particularly ball valves with metallic ball-seat-systems and/or with a low control air supply.

Main features:
- reduced operation torque of ball valves
- no wear and tear of sealing system, as the ball didn't touch the seat during switching operation => long service life
- significant reduction of the actuator size and air consumption

Field of application:

Nominal size:	DN50 up to DN300
Design pressure:	PN40 up to PN325
Temperature range:	-196 °C up to +400 °C



High performance butterfly valve AXIOM4

The AXIOM4 is a metal seated high performance butterfly valve with a solid body in wafer, wafer-lugged, double flange or welded end design.

The open and shut-off torque is almost pressure independent. Further features are the jam-free seat design under all operation conditions and minimized opening torque also under full differential working pressure.
The double-sided stuffing box and floating disc-seal design provides a self-alignment and force equalized operation. The AXIOM4 is equipped with an elliptical and self-aligned, solid metal and graphite free disc seal with pressure supported EQUINOX sealing system.

Main features:
- metal-seated
- numerical eccentric
- bi-directional gas-tight
- lowest torques and gas tightness
- absolutely friction- and wear-free swing movement
- elimination of negative hydraulic effects of triple eccentric butterfly valves
- no preferred flow direction

Field of application:

Nominal size:	NPS3" up to NPS43"
Design pressure:	Class150 up to Class600
Temp. range::	-196 °C up to +850 °C

For further information about KLINGER SCHÖNEBERG GmbH please visit www.klinger-schoeneberg.de.

Expansion of the Production Facility
A. W. SCHULTZE GmbH, Germany

A. W. Schultze GmbH expands production site

The production hall at Geesthacht (near Hamburg) has been enlarged considerably.

Brief Review:
In July 2001, a major fire destroyed a large part of the building at the Barsbüttel site.
After setting up emergency operations in Oberhausen and Barsbüttel, it was quickly decided to build a new construction in Geesthacht. This building was occupied right after its completion in March 2002.

Our efficient use of all resources available has brought about a successful commercial development which is reflected in the development of the company's turnover and especially in the development of earnings. Due to this growth, the need for production and warehousing space has increased considerably.

With the growing importance of the production of special, often multi-level seals, which are designed according to the customers' requirements and have to be delivered within a short time frame, and the expansion of these operations, we quickly reached the limits of our production and storage capacities.

Initial capacities:
- Storage volume of approx. 1,500 m^2– additional 400 m^2 is required
- Production space of approx. 1,000 m^2
- Incoming goods is overloaded
- Outgoing goods – additional 30 m^2 is required
- Provisioning room for finished goods: currently 20 m^2 - additional 30 m^2 is required

For this reason, planning for a hall expansion began in 2008.

Base:
- Additional storage capacity: 1,564 m^2
- Additional equipment reserves: 200 m^2
- Set-up of production/warehouse space for a doubling of sales plus reserves

Construction took place in 2011.

Since moving into the new production hall, there is adequate space for all of the production steps.

The benefits:
- Short transport routes
- Short delivery time – even for special products
- Sufficient space for production
- Secure, economical storage
- Economical work processes are supported
- Motivation for the A.W.S. team

For further information about A. W. Schultze GmbH please visit www.awschultze.de. ■

Production site in 2002

Projects and International team
From left to right: Adrian Holdsworth, Matthew Warters, Darwyn Peel, Mark Crawshaw, Ben Evans, Oliver Bache, Mark Williams, Philip Brunt

KLINGER UK Scoops International Trade Award

KLINGER UK has won a major award for international trade in the energy sector.

The company, one of the world's leading developers, manufacturers and distributors of quality sealing products for the global oil and gas industry, aerospace and defence markets, picked up the Energy Industry Award in the inaugural Yorkshire International Trade Awards.

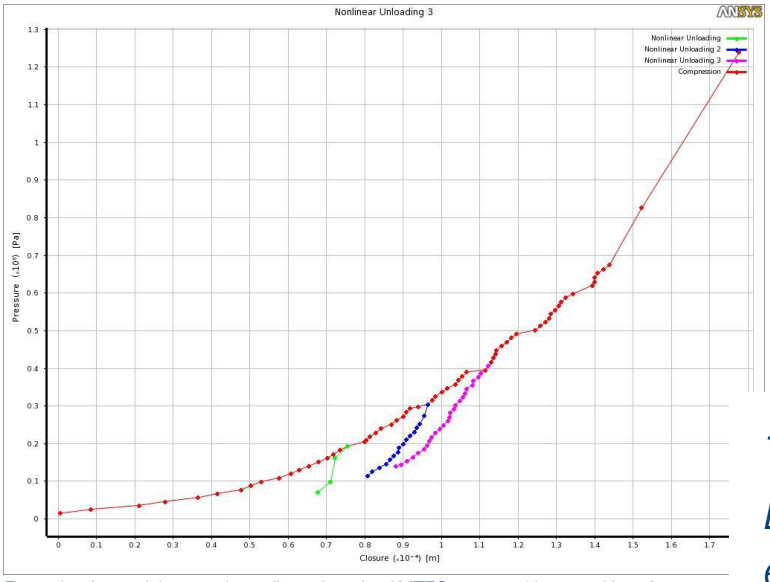
Leading manufacturers and professionals gathered at the Royal Armouries in Leeds for the prestigious event, organised by regional business magazine, Yorkshire Business Insider, in partnership with UK Trade & Investment, Leeds City Region and Sheffield City Region Local Enterprise Partnerships.

KLINGER UK Managing Director, Alan Bates, comments: "We're absolutely delighted to receive this award, which is testimony to our fantastic team, who have helped put KLINGER on the map in more than 40 countries across the world.

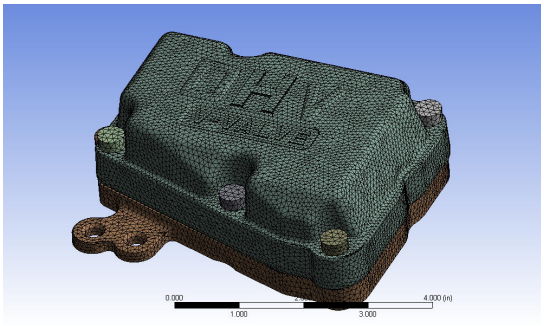
"International trade is fundamental to KLINGER's growth in the oil and gas industry, as well as in new sectors, such as aerospace and pharmaceuticals. We're very proud of the fact that of the main five gasket manufacturers in the UK, we are the only company that still believes in manufacturing its products in the UK. The quality control that gives us, coupled with a clear focus on customer service across all our international markets, is the foundation of our continued success."

For further information about KLINGER Limited please visit www.klinger.co.uk. ■

Improving gasket stress using FEA
THERMOSEAL Inc.



Example of material properties collected on the AMTEC gage and imported into Ansys



Valve cover mesh

Thermoseal uses Finite Element Analysis to enhance Sealing Reliabity

When analyzing gasket applications, the most important question is usually "How much gasket stress can be achieved?". Thermoseal Inc. in Sidney, OH USA, has employed the use of Finite Element Analysis to answer this question, and to make improvements to customer designs, to improve sealing reliability.

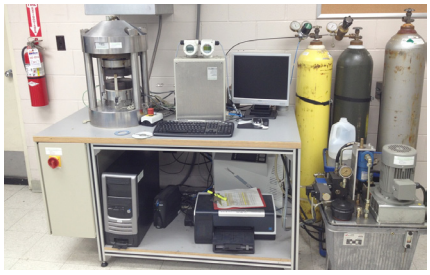
Finite Element Analysis is used to apply loads to vector models created in CAD software. The application of loads and the analysis of the resulting stresses and strains in the model allow engineers to optimize component designs, assembly torque patterns and to evaluate a joint using various gasket material models. This analysis process is very helpful to OEM customers who have questions such as:

- What is the optimal assembly torque pattern and torque value?
- Which material will produce optimal gasket stress?
- What is the optimal shape of the gasket?
- How thick should the gasket be?

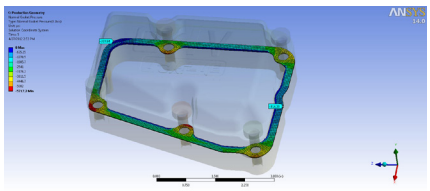
Once these questions are answered, the customer can move through the prototype process very quickly, and solve sealing problems much faster than the traditional trial and error method used in the past.

One recent case in which Thermoseal has used this technology to create real solutions involves an OEM customer who produces small internal combustion engines and was experiencing leakage problems on a valve cover gasket.

Thermoseal Engineers were able to evaluate the design that was already being used in production and begin to make changes to the design to improve the gasket stress. Thermoseal lab technicians created stress-strain curves for several gasket materials (including competitors' materials) using a high-tech AMTEC gage to collect this data.



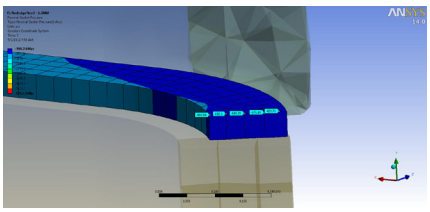
AMTEC gage



Analysis output – Gasket Stress

These stress-strain curves were imported into the FEA software, Ansys Mechanical, and used to perform several iterations of an "analyze and improve" process.

The result of 4 iterations of the "analyze and improve" process was a 2X increase in gasket stress!



Cross sectional view of joint
Gasket stress is significantly greater

These results are shared with the customer, and prototypes are also supplied within a matter of weeks.

For further information about Thermoseal Inc. please visit www.thermosealinc.com. ■

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Connect with quality