

simrit® insight.

No 1 | 2009

The magazine for Simrit customers

Simrit at the HMI

Trust the Original



Products

Plain and simple:
Turn three into one



Materials

FKM for truly harsh
demands



Applications

Multi-purpose
kitchen aid



Innovations

Custom-made
kits

www.simrit.com



Freudenberg Group



Dr. Jan Gupta,
Simrit

Dear Readers,

For over half a year now, the global economic and financial situation has challenged us all to behave prudently yet energetically. Actively shaping the future requires a secure framework for action above all else. This is not possible without reliable partners. Simrit is one such strong partner for general industry, which offers a diverse range of technologies and can give you advice regarding your application issues competently and in your own language.

The upcoming Hannover Messe highlights this reliable partnership once more because despite the current economic situation, we are there to continue our important dialogue with you in the usual manner. Reliable technologies, cost-effective systems, environmentally sustainable solutions and a secure partnership are the main themes at our exhibition stand this year. We have thus identified the requirements of our and ultimately your market and will demonstrate which products and services we can offer to meet them.

This issue of Simrit insight will give you a taste of what we will be presenting in Hannover. In our cover story on pages 4 to 11, we present the main themes in detail, illustrated by specific application examples. We offer you a deep insight into the basic principles of our materials expertise in the article about new FKM materials on pages 12 and 13, before giving forward-looking impetus with a contribution about customised component kits on page 19.

I hope these articles give you plenty of new ideas for your own developments and that they generate a need for discussion. Our specialists and I look forward to many interesting talks with you in Hannover. Visit us at Stand B26 in Hall 19.

Yours, Dr. Jan Gupta
Simrit

Trade fairs and events

Date	Trade fair	Place	Hall / Stand
20.04.–24.04.2009	Hanover Trade Fair MDA	Hanover, Germany	Hall 19, Stand B 26
15.06.–21.06.2009	Paris International Airshow	Paris, France	Hall 3, Stand B 11

Seminars

Date	Topic	Language	Place
28.04.–30.04.2009	Sealing knowledge for Simrit Distributors – Professional	german	Weinheim
12.05.–13.05.2009	Simrit profi seminar – hydraulic accumulators	english	Remagen
27.05.–28.05.2009	Simrit profi seminar – Sealing systems for cylinders in heavy-duty hydraulics	german	Hamburg

For further dates, please refer to the calendar of events on www.simrit.com

Imprint

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TechDay for Case New Holland

At a TechDay attended by specialists from the globally operating agriculture and construction equipment company Case New Holland (CNH) in the Italian city of Modena, participants praised the excellent technical demonstrations of the latest Simrit innovations and the detailed brief on how they can be applied to CNH's specific requirements. Topics ranged from axle suspension systems and hydraulics components, to combination and cassette seals, all the way to sealing systems with integrated sensors as well as encoders. The engineers and buyers made it clear: For them, a TechDay is also an opportunity to compare the Simrit range of products with those of the competition. Simrit did not need to shy away from the comparisons. The presentations demonstrated the entire innovative strength and the unique position of this world market leader in sealing technology and vibration control.

New bellows for Festo

The pneumatic linear drives from Festo are available to thousands of customers by catalogue worldwide. It is not unusual that drives are used in environments in which they are affected by (aggressive) liquids or dust. For these types of harsh environmental conditions, Festo has joined forces with Simrit to develop protective elements in the form of custom bellows. These are also to be included in the Festo catalogue. The bellows enclose piston rods and seals. They were developed in six different diameters, each with two stroke lengths (50 mm and 100 mm/125 mm). Using special clamping pieces, multiple parts can be combined to achieve the necessary stroke length in each case. The new components made of NBR and EPDM materials are safety class IP 54-compliant. The NBR components have already passed the endurance tests from Festo. One particular challenge encountered in development involved the adapting of details to the installation space while taking into account the expected deformation resulting from movement of the bellows. While the 24 different bellows were being developed with two different types of materials, twelve shaping tools had to be built at the same time. In the case of NBR, the bellows have already been approved; tests for EPDM are still in progress.

The Festo bellows come in stroke lengths of 50, 100 and 125 mm.



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A true Original

In terms of purchasing, sealing components are sometimes considered as C-parts; in terms of their importance and function, however, they are A-parts. Example Drive technology: Here the Simmerring® plays a central role.

The various different types of Simmerrings are used to seal rotating shafts in engines and gearboxes, ensuring that the lubricant remains inside the application. While the share of the cost of sealing components in industrial gearboxes generally makes up less than 1 percent of total production costs, the calculation looks much different when considering the entire life cycle of an aggregate. At the Hannover Messe 2009, Simrit will demonstrate the central importance of seal and vibration control-related elements in terms of four key aspects: dependable technologies, efficient systems, environmental solutions and sound partnerships.

The world's largest wealth of experience

Ultimately, the realisation of these four elements depends on the same basic elements: materials competence, innovative strength, rigorous quality management and a breadth of experience in functional integration. Since Simrit introduced the original Simmerring made of synthetic rubber in 1938, the company has continued to succeed in expanding these skills. With over 2,000 compounds, Simrit has the largest database of materials at its disposal. Simrit has demonstrated its expertise in functional integration through a variety of Simmerrings offering additional properties. And thanks to its unique Lube&Seal service, Simrit has demonstrated its experience in dealing with the interplay between sealing components and lubricants.

Eco-Friendly Sealing

Energy efficiency is a high priority when it comes to development at Simrit. Thus, the Simmerring Energy Saving Seal (ESS) offers the highest sealing effect combined with a minimised dissipation loss. By optimising the power consumed by friction, the fuel consumption is reduced. In turn, emissions are reduced as well. Simrit components also play an important role in systems designed for regenerative energy generation. Simrit therefore offers complete sealing and vibration control solutions for a range of applications including solar and wind power plants.

Value-Added Sealing

The purchase price of a sealing component reveals little about the efficiency of the part, which should be able to serve its function throughout the entire life cycle of the aggregate. Thanks to the integrated approach of the tribological system, Simrit seals are developed to make your systems more stable by preventing expensive downtimes resulting from premature failures. Furthermore, the economy of the total solution is improved through the use of standardised sealing systems.

Reliable Sealing Partner

As a company belonging to the Freudenberg Group, Simrit is part of a well-financed family holding and has a recognised presence in the global arena. A broad body of knowledge concerning the most diverse of technologies makes it possible to perform a comprehensive assessment of your systems. Thanks to Simrit's high degree of application expertise, you gain a partner who can proactively accompany you through your development process from the outset.

Long-Lasting Sealing

Due to increasing power density, the demands placed on seals are increasing all the time. Simrit is able to use its comprehensive materials expertise in order to continuously develop new compounds that are able to meet customer requirements that are becoming ever more stringent with respect to dependability. Customer and application-specific product designs must always undergo the latest simulation and test methods, from materials development to the series production of the seal.



Expertise on the FLENDER test bench

The Mechanical Drives business unit of Siemens AG is the leading provider for mechanical drive technology world-wide. Under the Flender brand, the business unit offers industrial gears and couplings for nearly all industrial applications. Siemens Mechanical Drives has been working with Simrit for quite some time for its lubricant recommendations.

The operating reliability of gearboxes is not least the result of the dependability of the rotary shaft seals that are used. For the approval of lubricants in Flender gearboxes, the compatibility of the seals with the lubricants is crucial. To this end, both companies have worked together on projects to develop a comprehensive testing programme known as the Flender Test. Against the backdrop of increasing lifecycle requirements for the entire system, this test scenario has now been revised with the goal of achieving a considerable improvement in the dependability of the test results. With the introduction of the Flender Test, the compatibility between the lubricant and the Simmerring has been decisively improved. The method has also proved a pioneer for

new gearbox lubricant formulas. Siemens Mechanical Drives guarantees that a significant improvement in the operating reliability of the gearbox will be realised. The specifications of the enhanced Flender Test go beyond both the requirements of the static tests in accordance with DIN ISO 1817 as well as requirements of the dynamic oil compatibility test based on DIN 3761.

Expertise combined

Over the course of an optimisation process lasting about a year, Simrit and the Siemens business unit worked to further develop the current test specifications on a fundamental level. As a result, it was possible to significantly improve the correlation between the test results and the real life-



Flender gearboxes – greased with Simrit's expertise

cycle values of the Simmerrings. Simrit's expertise in the area of compatibility of sealing elements with lubricants and Siemens' expertise in the field of gearboxes was combined in the Flender Test. Both companies were therefore able to improve the dependability of the sealing systems. An additional step towards increased environmental compatibility was also made by incorporating lubricants from renewable resources into the test series.



In brief

- The compatibility of lubricants with Simmerrings ensured by way of the Flender Test
- Project work between Siemens Mechanical Drives and Simrit offers technical and economic benefits



Do you have any questions or suggestions? Please contact martin.mueller@simrit.de



Protection for people and the environment

When the matter at hand is to preserve the environment or protect human beings, no ordinance can be thorough enough. The purpose of the EU chemicals directive REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) is to ensure the safe use of substances and thus protect people and the environment. The directive stipulates that only chemical substances which are registered and approved may be handled and brought into circulation. Simrit and other companies of the Freudenberg Group who process chemical substances are only indirectly affected and are not subject to the preregistration and registration obligations required by REACH. The upstream suppliers, however, must register most of the raw materials used by Simrit from 2010 to 2018.

Quality assured

As an internationally operating family company and specialist in elastomer materials, the Freudenberg Group has accepted a responsibility for people and the environment from the very beginning. Simrit therefore takes advantage of the long-standing and faithful relationship to its raw materials suppliers and works closely with them to make arrangements concerning the implementing of REACH requirements. This allows Simrit to recognise early on when a substance used in the past would no longer be permitted. Measures can then be taken in order to meet the REACH requirements and to maintain the quality of the products. Although Simrit is not subject to registration obligations, the company is still an active participant in compli-

ance with the REACH directive because Simrit provides its suppliers with information for the registration. The implementing of the REACH directive inside the Seal and Vibration Control business division of Freudenberg is organised using a system of trained REACH representatives for each business unit and a uniform REACH database.

Contact



Any questions or suggestions? For information about REACH, our customers may contact central REACH coordinator Terry Coles. terry.coles@simrit.com

A laser "brand mark" for genuine parts

Time and again, even small parts such as rotary shaft seals are counterfeited. At first glance, both – genuine and "replica" – look deceptively similar: rotary shaft seals and nothing more. But the similarity fools. Even on the test benches in the Simrit lab, when subjected to a test that is not particularly harsh, it quickly becomes clear how dissimilar the original and the copy truly are. The counterfeit part already exhibits visible changes after undergoing 24 hours of continuous operation and the first cracks after 96 hours. This inevitably results in quick leakage. In contrast, the genuine sealing ring showed no signs whatsoever of abrasive wear after this time. For product imitators, achieving the great visual similarity between the genuine and counterfeit or even a direct reproduction poses a great temptation. But beware! Simrit now has the necessary expertise (patent pending) to use a laser to label the gen-

uine elastomer. The seal is provided with an encoded marking, which allows the Simrit product to be easily distinguished from the counterfeit. All that is needed is a scanner, Simrit's security software and a common notebook computer. The laser marking is not only a means used to combat product piracy; it is also used

for tracing seals. This allows a Simrit customer to trace laser-inscribed component numbers and therefore discover any unauthorised warranty claims. In the future, Simrit products bearing the "safe"TM (secure adaptive freudenberg encryption) mark will refer to the unique laser marking that has been used.



Using a laser, the seal is provided with an encrypted mark that cannot be counterfeited.

Contact



Any questions or suggestions? For information regarding the laser marking service from Simrit, please contact Mr. Hoffer. bernhard.hoffer@simrit.de



20,000 hours plus

Together with the gear manufacturer ZAE-AntriebsSysteme, Simrit and Klüber have designed a Simmerring that can withstand 20,000 operating hours without maintenance or damage.

High-value transfer systems for assembly technology are in continuous industrial operation. A premature failure of a radial shaft sealing ring in the gearbox of such transfer systems would result in costs that would be out of all proportion to the purchase price of the sealing element.

A German machine manufacturer thus required of the gear supplier ZAE-AntriebsSysteme and Simrit as the seal supplier that the units run at least 20,000 operating hours without failure or maintenance, with a survival probability of more than 99.9 per cent.

Component analysis

ZAE-AntriebsSysteme and Simrit had to find a way to structurally design the highly stressed seal so that the service life required by the machine manufacturer could be achieved. The operating conditions of the Simmerring were investigated by a working

group consisting of specialists from ZAE-AntriebsSysteme, Simrit and lubrication specialist Klüber (which likewise belongs to the Freudenberg Group) at the critical spot with regard to the factors that influence service life.

Initially, the influence of the seal environment's structural design was theoretically investigated using analytical and numerical calculations of the speed and pressure distribution in the ring space between Simmerring and roller bearing. The theoretical results that were based on simplified assumptions were then surprisingly well verified in experiments.

It became clear that sharply rising temperatures at the sealing edge are dependent on the structural character of the Simmerring and on the material used. Through reduction of the ring space diameter, improvement of oil circulation and use of the wear-resistant Simmerring elastomer 75FKM170055, an insufficient lubrication at the sealing

edge was prevented so that favourable lubrication and cooling conditions arose in the contact zone of shaft and Simmerring.

Low failure rate

In the laboratory test – and under the nominal condition of ca. 50 °C oil sump – the newly designed FKM sealing element proved to be functional beyond 20,000 operating hours, and with an extraordinarily low failure rate. Practice-oriented tests on a special test bench now follow that Simrit, Klüber and ZAE-AntriebsSysteme have jointly developed. The Lube&Seal programme can also deliver valuable knowledge on the structural design of sealing elements. Lube&Seal is a service of Simrit and Klüber providing optimisations of the tribological system. The advantages are fewer down-times and thus lower down-time costs, lower energy consumption and lower follow-up costs.



Automated manufacture of door frames with ZAE gearboxes.



In brief

- Simmerring for gearbox that remains functional for 20,000 hours without maintenance
- Joint tests by Simrit, Klüber and gear manufacturer
- Theoretical calculations and experiments on structural design
- Practice-oriented test benches



Any questions or suggestions?
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Dependable Technology Partnership

When developing dependable drive technologies, reliable partners are crucial. In the case of the drive specialist Wittenstein, Simrit was involved early on in the reworking of the SP and TP drive series. A new wear-resistant elastomer has helped to improve the service lives.

For companies like the gearbox and drive specialist Wittenstein AG, who supply systems to nearly all branches of mechanical engineering, aviation and aerospace, the first priority is technological reliability. Wittenstein expects partners for whom dependable technologies are also the top priority and who can be seamlessly integrated very early into development projects thanks to equal quality standards. "This ensures that high-quality products are developed to offer a maximum benefit to the customer," explains Walter Lang, Head of Development for Drive Components at the Central Development department of Wittenstein AG:

Early incorporation into projects

As a specialist in seal technology, Simrit was involved in the reworking of the SP and TP gearboxes from Wittenstein, beginning as early on as the initial design considerations. The goal of the project was to increase the service life and reduce the running noise in gearboxes. The seal specialists also made suggestions early on to optimise the surface treatment of the shafts and made a case for the use of a Simmerring made of the new wear-resistant 75 FKM 170055 elastomer. As a result, the wear rates and warm-up times



Technical dependability is integral to gearboxes from Alpha Wittenstein.

of the sealing system were considerably improved. In concrete terms, the new elastomer was 30 percent better than the industry standard. Use of the new material yielded considerably longer service lives for gearboxes, fewer faults and less downtime.

Even higher systems utilisation ratio

The benefits not only strengthen the reputation of Wittenstein and its customers in a variety of industries; they also provide customers with tangible financial benefits. The systems require maintenance less often, the low fault occurrence and downtimes improve the overall utilisation ratio of the systems. "Thanks to the competent advice provided by Simrit, it was not only possible to improve the dependability of our products even more; now we can also include dependability forecasts for seal technology used in our products," says Volker Metzger, Head of Customer Service at Wittenstein AG.

The open, constructive project work not only allowed the goals of the project described here to be achieved; a shared base of knowledge was also established for future projects.

In brief



- Cooperative work between Wittenstein and Simrit in the reworking of two different gearbox series
- All competences (lubricants and seals) were supplied from a single source
- Based on the excellent qualities of the Simmerrings, Wittenstein products can be used for a broad range of applications



Any questions or suggestions? Please contact andreas.franke@simrit.de



Gearbox series SP. Simrit was integrated early on, beginning with the initial constructional considerations.



Minimal Emissions with 70 XIIR 232175

In SF₆-gas insulated switchgears, O-rings made of an innovative, high performance elastomer ensure that the insulation gas, sulphur hexafluoride is sealed off even under extreme conditions. O-rings therefore represent efficient environmental protection.

Gas-insulated medium and high voltage switchgears ensure that, in the event of network failures in electrical distribution networks, a switchover to functioning power supplies occurs within fractions of a second. In order to protect persons and prevent consequential damage such as fires, the faulty power supply is switched off within milliseconds. This involves ensuring the capacity to handle short-circuit currents of 20,000 to 40,000 A.

Particularly high requirements

Compared to conventional switchgears, gas-insulated systems are clearly superior when taking into consideration primary energy consumption, greenhouse gas potential, acid rain and eutrophication potential (over-fertilisation). In addition to these factors, only gas-insulated switchgears meet the ecological policy conditions of the Kyoto Protocol and work independently of environmental influences. The requirements governing sealing technology are especially strin-

gent in gas-insulated systems. The reason for this is that this technology protects live sections from coming into contact with the outside atmosphere by enclosing them in, e.g., gas-tight stainless steel containers. The mechanical and electrical grommets between the interior, which is filled with the insulating sulphur hexafluoride (SF₆) gas, and the exterior are sealed off from each other with O-rings, among others. These O-rings make it easy to meet the required operating leakage rates, which are considerably less than 0.1 percent per year for SF₆.

Minimised permeation rate

Normally EPDM elastomer is used for these purposes. Today, however, Simrit is able to meet the requirements even better than EPDM thanks to the development of high performance 70 XIIR 232175 elastomer.

O-rings made of this material work well as static seals, even at temperatures as low as -60 °C. The long-life seal quality has an extremely low compression set and excellent chemical resistance, making the material equivalent to the values exhibited by EPDM O-rings. Yet again, the permeation resistance against gases such as N₂, He and especially SF₆ has been significantly improved with 70 XIIR 232175. Seals made of this material, when dimensioned properly, therefore offer an extremely long life, minimised permeation rate and optimum hardness. Use of O-rings made of 70 XIIR 232175 allow emissions from gas-insulated switchgears to be reduced to an absolute minimum during normal operation. The expected life of the switchgear can be increased to as long as 40 years.



O-rings made of the new high-performance material 70 XIIR 232175 further improve the environmental compatibility of switchgears.



In brief

- Only gas-insulated switchgears meet the standards of the Kyoto Protocol
- O-rings made of 70 XIIR 232175 have a minimised permeation rate
- Absolute minimum emissions of the switchgears over a service life of up to 40 years



Any questions or suggestions?
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Thanks to its holistic approach, the new Damp & Seal element integrates several functions into a single component, while simplifying the cylinder at the same time.



Plain and simple: Turn three into one

Simrit's new Damp & Seal damper seal for pneumatic cylinders integrates three functions into a single component. This reduces resource consumption, improves functionality and thus reduces costs.

Pneumatic drives are used in nearly all engineering sectors. The crucial parameters when selecting seal components are dependability, robustness and a long service life in addition to simplicity, range of variation, environmental compatibility and economy. By integrating multiple functions into a single product, it becomes considerably easier to realise these target values.

A patented new method for end position dampings in pneumatic cylinders has allowed Simrit to combine damping as well as static and dynamic sealing in a single component. The overall design considers not only the seal itself, but rather the entire system: the damper seal, air supply and dissipation through the throttle, the geometry of the cylinder cap and the assembly method.

Benefits spanning from assembly to purchasing

By eliminating the complex undercut for seating the damper seal, the cylinder cap geometry is simplified. This, in turn, not only saves on machining costs on the cover; above all, the complexity of the assembly is notably reduced. Reducing the number of components that have to be assembled results in time savings of 50 percent or more. Be-

cause the circumferential venting passages on the sealing component make a precisely angled installation position unnecessary, it is impossible to make any errors during installation. In other words, no rejects are created during installation.

The Damp & Seal system also offers clear benefits in purchasing and logistics. By reducing the variety of parts, the number of suppliers can be reduced. Thus, the time required by the purchaser, depending on the design, is considerably less than with the old version. Accordingly, receiving inspections as well as storage costs are eliminated. Not least, the risk of mixing up different components and the space requirements in the assembly cell are reduced.

Hardness test for prototypes

Initial tests with damper seal prototypes compared to those of traditional designs exhibited an improvement in the dynamic behaviour of the damper seal. Thus, no measurable stroke reversal of the piston could be detected during the damping phase. In addition, the starting friction was minimal. Even after millions of cycles in the life cycle test, the seals exhibited no visible wear. Last but not least, the new damper seal offers

improved industrial safety: The high elasticity of the damping pads minimises noise, thus reducing the stress factor for the worker.

Damp & Seal is setting new standards and is certain to become the benchmark for future generations of cylinders. Manufacturers of pneumatic cylinders should take advantage of the unique properties and functional advantages of this innovative seal and damping element for new series of cylinders or the further development of existing ones.

In brief



- Rigorous integration of functions in damper seals for pneumatic cylinders
- Fewer parts and therefore reduced logistics and purchasing costs
- Minimised dynamic stress and noise
- Unique opportunity for a developmental leap for pneumatic cylinders



Any questions or suggestions?
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FKM for truly harsh demands



In brief

- FKM is characterised by its resistance against high temperatures and a broad spectrum of chemicals
- The Simrit material 75 FKM 260507 offers the highest resistance against aggressive, amine containing lubricants
- Simrit offers a broad portfolio of FKM materials to meet any need



Any questions or suggestions?
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Seal elements made of fluoroelastomer materials are especially well-suited in environments where high thermal and chemical stability is needed. For especially problematic environments such as high-additive lubricants, Simrit has developed special FKM mixtures.

When selecting an appropriate material for seal elements, in addition to the temperature range in which the seal is used, it is essential to consider the particular liquid or gas with which the material will come into contact. As a result of the swelling behaviour or shrinking, as well as the chemical durability of an elastomer, these media greatly affect the durability of a seal element.

Fluorine to protect against highly aggressive environments

In the case of all applications for which high thermal and chemical stability are important, fluoroelastomers of various types are particularly well-suited. The resistance of fluoroelastomers to high temperatures (for round-the-clock operation, these types of materials withstand temperatures up to 200 °C) depends on the polymer structure and systems of



The sealing lips of a Simmerring, following a test cycle with a standard FKM material (above, with crack formation when lifting) and a BRE-FKM material 75 FKM 260507.

cross-linking. This cross-linking can be created with diamines, bisphenols or peroxides. The chemical durability depends on the level the fluorine content. The higher the fluorine content, the better FKM materials are able to withstand highly aggressive environments. Seal materials are subjected to especially harsh demands with respect to temperature and the surrounding medium in the case of utility vehicles and mobile machinery. Considering that high-additive motor oils and temperatures continue to become more extreme, thermal and chemical stability are becoming more crucial all the time. Simrit's low temperature compounds 70 FKM 6016 and 70 FKM 260737 for dynamic applications exhibit favourable swelling behaviour as well as excellent abrasion resistance and outstanding relaxation behaviour. The material 70 FKM 260737 is espe-

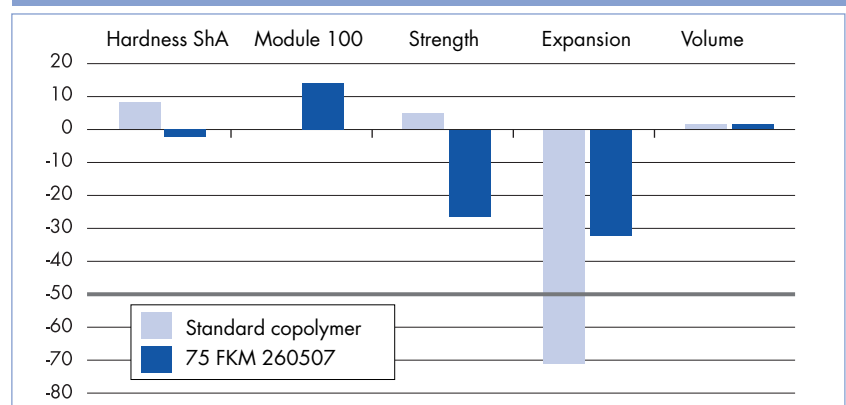
cially well-suited for use with biodiesel or low-viscosity lubricants. The development of a new generation of long-life oils for engines and drives has made it possible to increase service lives by

more than 1000 hours. These oils are mainly mineral based, with a high percentage of amine additives.

'Base-resistant' FKM

Standard FKM materials based on bisphenol interlinked copolymers or terpolymers for axles and drives are chemically damaged by these high-additive oils. This is why so-called 'base resistant' (BRE) FKM types were developed, as they exhibit a high degree of stability in high-additive oils. The material 75 FKM 260507 thus showed only slight changes to the mechanical properties when surrounded with the aggressive Castrol SAF XO motor oil at 150 °C for 168 hours, while the standard FKM copolymer under the same conditions resulted in a reduction of the elongation at break by over 50 percent, thus limiting the sealing functionality. The new high-performance material 75 FKM 260507 also retains its seal functionality even after a 1000 hour test run in an aggressive long-life motor oil. The new BRE-FKM material thus offers the utmost durability in aggressive lubricants as well as a long working life. The portfolio of FKM materials from Simrit ranges from standard types to specially modified mixtures with the highest chemical resistance, all the way to low-temperature flexible materials for dynamic applications as well as materials such as 75 FKM 170055 which are optimised for long life and hard wear.

Change in the mechanical properties (percent)



Media durability of a standard FKM material compared to the special type 75 FKM 260507 in reference oil Castrol SAF XO at 150 °C for 168 hours.

The Rocket Boomer XE in action: Atlas Copco is the mining and drilling specialist.

Optimum impact power

The COP 3038 hydraulic rock drill from Atlas Copco is used in harsh territory under the toughest conditions. Nonetheless, the length of time required between service intervals is increasing. High-quality sealing elements are thus indispensable.

The COP 3038 hydraulic rock drill from Atlas Copco, equipped with a nominal output of 30 kW, drills up to 30 metre deep (blast) holes into granite and many other hard rocks with a drilling speed of approximately 5.3 metres/minute. The powerful device from the globally operating Swedish company has an impact rate of 100 Hz and thus achieves 50 percent more penetrating power than its predecessor, the COP 1838. Despite the clear increase in performance, the device gets by with 10 percent fewer moving parts and thanks to a new impact mechanism design it is 12 mm shorter and 5 kg lighter than its predecessor.

Due to a hydraulic double damping system, the recoil energy of the rock drill is absorbed so that the drill steel is spared despite the high number of impacts. The hydraulic rock drill has N₂-impinged damper accumulators that even out the pressure peaks in the hydraulic system and thus reduce wear, both on the drill

steel and on the drilling rig itself. To further reduce wear a double sealed flushing chamber prevents dirt and moisture from penetrating the system.

Special and catalogue parts

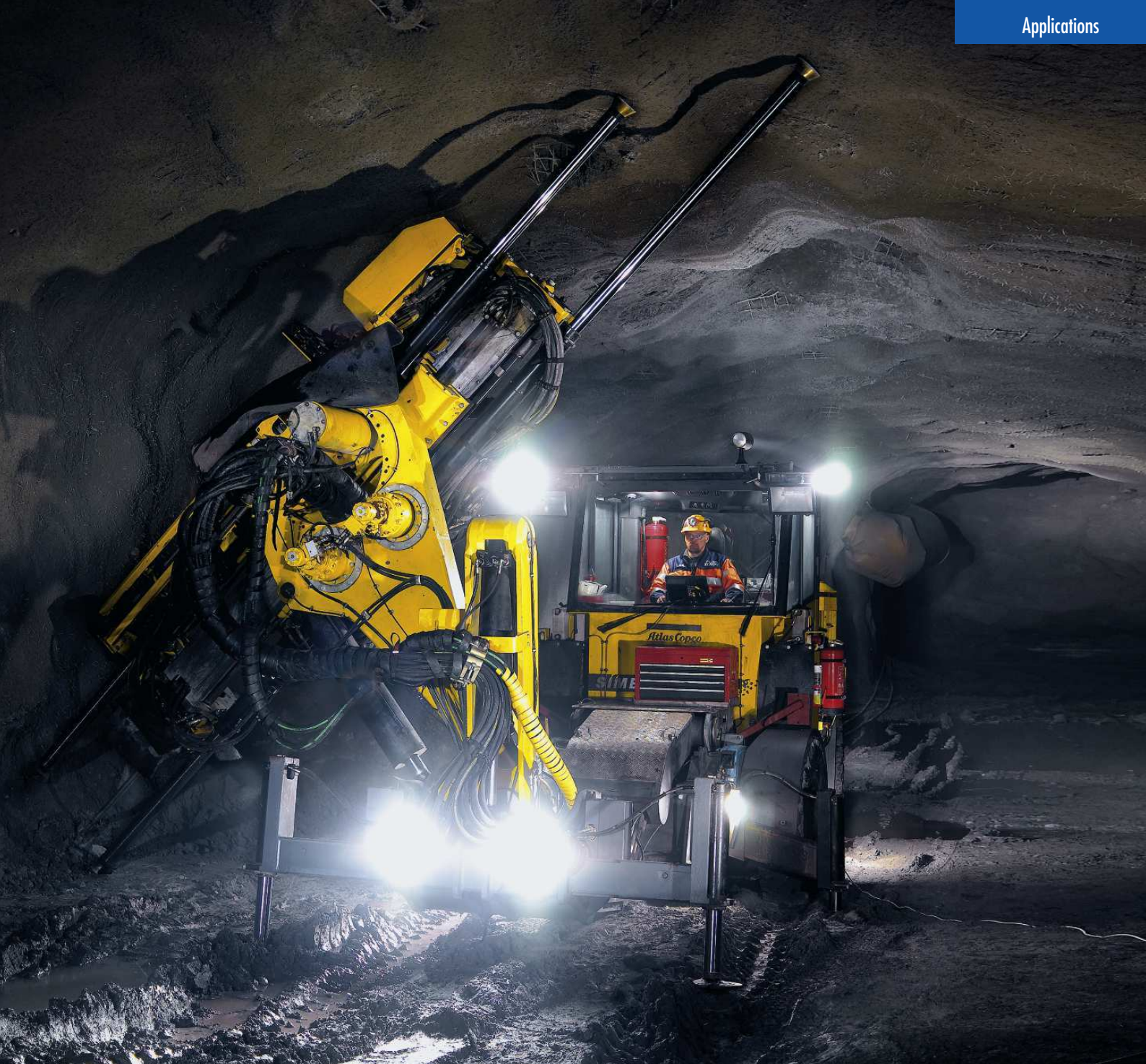
When it's a matter of preventing contamination of the pressure medium, which is disastrous for hydraulic devices, Simrit comes into play as the sealing specialist. As absolute precision devices with energetic peak outputs, the rock drills from Atlas Copco put the highest demands on the individual sealing components. For that reason, Simrit is a long-standing partner and preferred supplier that delivers both catalogue components as well as customised parts developed jointly with the Swedish mining and drilling specialist. In addition, there is a regular exchange at management level about economisation potentials and local stockkeeping at Simrit for the drilling specialist. A Simrit special-

ist is assigned specifically for the close technical collaboration with Atlas Copco.

From the catalogue product range Simrit supplies, among other things, Simmerrings, U-cups, PTFE seals and for static sealing Coverseals/Stircomatic as well as standard O-rings. Specially developed "reinforced" diaphragms are used in customised solutions. The diaphragms that were developed in close cooperation are used at various points on the rock drill. On the one hand, they have to reliably separate the hydraulic oil chamber



COP 3038 hydraulic rock drill: highest requirements for seals



from the nitrogen chamber; but on the other hand, they have to withstand the tremendous pressures in the chambers of up to 200 bar without being damaged.

Know-how sought after

Despite the tremendous impact rate and the extraordinarily fast impact mechanism of the rock drill, the components used are required to last longer and longer. "Our aim is for our rock drills to endure up to 800 hours undamaged in tunnel drilling and similar tasks in hard rock,"

says Lars Persson, Development Director of the Mining Division at Atlas Copco. He especially counts on Simrit's know-how. It is sought after both in the materials area and also in the design area. The close and long-standing partnership between the two companies is a good precondition for this, since there are many specialist teams brought in that are focused on the highest quality.

Not least, the global presence of the two companies is a decisive foundation for the successful mastery of future challenges.

In brief



- Rock drill with high-frequency impact mechanism puts high demands on the sealing elements
- Simrit supplies products from the catalogue range and customised elements
- Long partnership on many levels



Any questions or suggestions?
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Thermomix from Vorwerk is a multipurpose kitchen appliance for a variety of applications such as chopping and heating.



Multi-purpose kitchen aid

Simrit encountered one particular challenge involved in the sealing of the blade bearing of the Thermomix multipurpose kitchen appliance from Vorwerk. The reason for this is that the oil lubrication normally used for Simmerrings® was out of the question from the outset.

Is it a set of scales, an intelligent cooking device, or a mixer? In fact, it is all these things – and a bit more. The Thermomix TM 31 multipurpose kitchen appliance from Vorwerk combines the functions of more than twelve individual kitchen utensils, allowing you to prepare meals and drinks with a single device. The unit weighs, chops, mixes, stirs, cuts, crushes, grinds, pulverises, kneads and emulsifies. At the same time it cooks and steams. Whatever the heart desires.

All of these culinary arts are on the cutting edge, so to speak. When rotating to the right, the blade chops up the ingredients as finely as the operator wishes. Left rotation gently stirs sensitive foods like risotto and goulash, without chopping or otherwise damaging them.

Simmerrings for blade bearings

At first, the blade in the Thermomix looks no different than that of any other cold mixer. However, the stress on the roller bearing and its seals is much different with a hot mixer than with a cold mixer whereby simple lip seals are normally adequate.

In the case of the Thermomix seals are needed that can easily withstand a cooking temperature of 90 to 115 °C – and at high blade speeds and notoriously insufficient lubrication. In addition, the operator expects that the machine will stay firmly in place when the blade is rotating. Using a PTFE Simmerring and a solid rubber BA

Simmerring filled with grease, Simrit helps the kitchen device to run smoothly and successfully prepare the dishes.

As already indicated, the general set of ambient factors poses a true challenge. Because it is an application used to process foodstuffs, lubricating the Simmerrings with oil – as is the case in most industrial applications – is not possible. The Simmerrings used to seal off the blade bearings work practically under dry running conditions – in conditions where braising takes place and where it can get quite “hot and greasy”.

Greases for initial lubrication

The dry running is compensated by an initial grease lubrication. The grease, which has to meet the government supervisory authority for food industries (for example, the Food and Drug Agency in the U.S.A.), was selected by Klüber, a company, like Simrit, also belonging to the Freudenberg Group. Simrit and Klüber have a great deal of experience concerning the compatibility of fats and oils with shaft surfaces and their sealing elements.

For years now, Simrit has supplied Vorwerk with sealing rings for Thermomix kitchen appliances. For the sealing of blade bearings, these have proven to be extremely long-life and dependable components.



Products from Simrit help to ensure that the Thermomix runs smoothly.

In brief



- In Thermomix kitchen appliances, high speeds and high temperatures are combined with insufficient lubrication.
- Simrit has solutions to meet all thinkable needs, even for kitchen devices à la Thermomix.
- Simrit's materials expertise and experience with the compatibility of sealing elements with greases and oils allowed the challenge to be solved with competence.



Any questions or suggestions?
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Container ship travel is a time-dependent business. Downtimes can be expensive.

Cool O-rings in hot environments

The sealing of turbochargers demands materials that can withstand high temperatures, without being damaged. Simrit now supplies ABB Turbo Systems AG with 20 different types of O-rings made of temperature resistant FKM.

Exhaust gasses are waste products? On the contrary! The resource simply has to be utilised. For example, exhaust from diesel or gasoline engines contains so much power that can, when used intelligently, unleash the true potential of these engines. Headquartered in the Swiss city of Baden, ABB Turbo Systems has been improving the performance of diesel and gasoline engines through its turbocharger technology for more than eight decades. The product range of the corporate division of ABB includes the right supercharger for each 2-cycle and 4-cycle engine. And these superchargers are tailored to achieve effi-

cient operation in the 500 kW to 25,000 kW power range. The exhaust of the engine is used by a turbine to drive a compressor which compresses air into the cylinder compartments, thus increasing the power of the engine. This principle allows the engine power to be increased by a factor of four as a result of supercharging – nearly 75 percent of the total power of an engine. The turbocharger is thus a central power element of an engine and is absolutely indispensable. If, for example, a container ship were to pull into port several days late due to a failed turbocharger, this could cost the ship-

ping company a great deal of money. This could be caused by inconspicuous and cheaper components. If these are of inferior quality, the turbocharger can fail, resulting in higher costs. ABB Turbo Systems is therefore pleased with its partnership with Simrit which goes back more than ten years. Customers have had positive experiences with the FKM seal elements used for high temperature ranges. The O-rings made of high temperature resistant elastomer 75 FKM 171978 guaranteed to be oil-proof on both the exhaust side – even at a temperature of 250 °C – as well as for the compressor air at 200 °C.

Longer service intervals

Business with the high temperature resistant FKM mentioned above began in 2004 with three different sizes of O-rings. Today, there are 20 different sizes. Because the installation situation does not permit any changes during operation, the O-rings must be adapted to the particular conditions present. Despite the ever increasing standards that result from increasing temperatures, it was possible to considerably increase the service intervals of the O-rings. Shippers, for example, can be sure that even after turbochargers have been operated for extended periods their containers will be delivered on time.

In brief

- ABB turbochargers increase the power of a diesel or gasoline engine by a factor of four
- Turbochargers are used in all types of ships, in mining vehicles, diesel locomotives and power plants using diesel or gasoline engines
- Simrit provides custom high temperature resistant FKM O-rings for ABB turbochargers



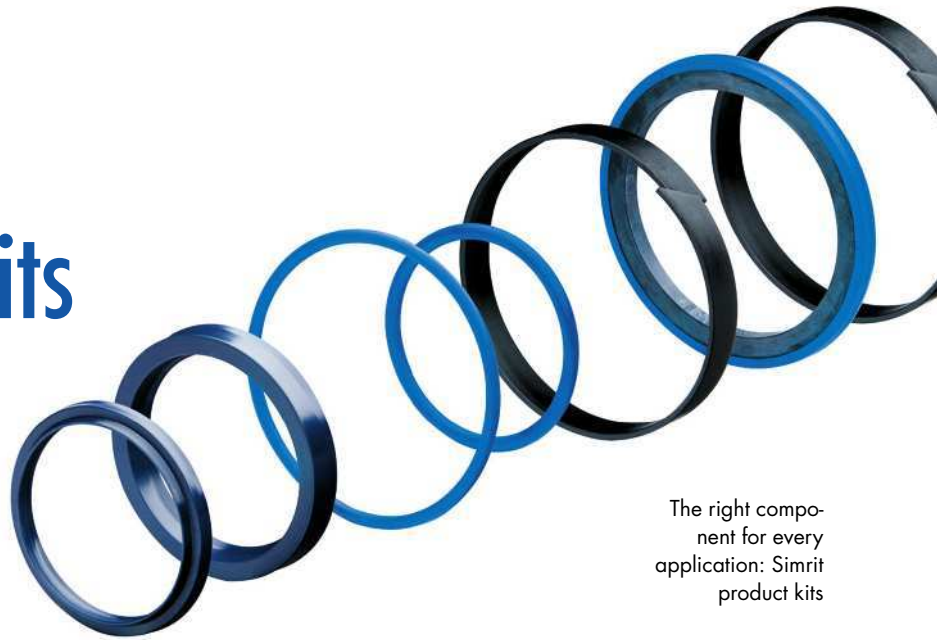
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A compressor plate with seal ring from Simrit.

Custom-made kits

The use of custom-made component kits, such as those from Simrit, allows for a considerable rationalisation potential for manufacturers of mobile machinery.



The right component for every application: Simrit product kits

The number of individual parts that can be installed in mobile machinery for agriculture and forestry are almost countless. And the number of suppliers offering the various components is equally vast. In the case of some manufacturers, parts originate from as many as 30 different sources. This requires a high degree of coordination, which translates to time and money for warehousing and quality control.

Simrit has experienced years of success in Scandinavia and the UK with its custom-made component sets or kits. The kits, which are mainly available for the forestry, mobile machinery and materials handling industries, contain up to 20 different parts and are provided with the logo of the particular customer as well as all labels required by the customer. In addition to Simrit seals, the kits also include the third-party parts needed for the particular application. The spectrum of components ranges from greases to metal parts, all the way to screws and tools needed to use the parts.

Clear cost advantages

The forestry machinery manufacturer John Deere Forestry is the largest Simrit customer of the kits, which are assembled precisely for the respective application. "The kits create considerable savings for our company," said Per Hedman, Head of Purchasing at John Deere Forestry. „There are purchasing savings, since every single

component doesn't have to be calculated and negotiated, and also in storage, since up to 20 storage spaces can be saved."

Jan Backberg, purchaser at ZEPRO, a subsidiary of the Swedish Hiab Group and specialist for hydraulic platforms, sees similar advantages as Per Hedman and also emphasises the aspect of quality assurance, which is improved thanks to the custom-made component kits: "The kits help us achieve consistently high quality," explains Backberg. He adds, "Simrit delivers only original parts. For many applications, seals of poorer quality can be replaced with Simrit seals,

which are more dependable in harsh environments and easier to mount."

Opportunities during the recession

Currently in excess of 1,500 different kits are supplied by Simrit Scandinavia and Simrit UK & Ireland each year. A number of Simrit service centres, including both Sweden and the UK, have bespoke kitting and labelling facilities on site. Joakim Fond, Simrit Managing Director for Northern Europe is confident that particularly during an economic recession, which, in 2009, has affected the entire world, even more aggregate manufacturers will draw on the advantages of tailor-made component kits.



Currently more than 1,500 different kits are supplied by Simrit.

In brief



- Custom-made component kits made for mobile machinery in the forestry industry and for materials handling equipment
- Simrit use third-party suppliers for parts the Freudenberg Group product programme doesn't include
- The kits provide cost savings in terms of purchasing, personnel and logistics



Any questions or suggestions?
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