



New Dimensions in Sealing

Simrit Overview

Your Technology Specialist

simrit®



At Simrit, our goal is simple: to provide our customers with an “unfair advantage.” Our design expertise, material development capabilities, and process excellence combine to allow our customers to outperform their competitors.

Simrit—Your Technology Specialist

Technology is a world of extremes—extreme temperatures, altitudes, depths, sizes, and chemicals. It’s a simple truth that, just as pioneering industrial operations break new ground, these same achievements present new challenges to the success of these critical systems. In striving to do more, to go further and move faster, technological industries continue to push the limits of system integrity under more challenging conditions. The difference between improbable and possible at this level of innovation often comes down to the choice of critical sealing technology.

Welcome to the unrivaled power of Simrit.

Simrit is the industrial sealing products division of the Freudenberg and NOK Group companies, one of the world’s largest suppliers of elastomeric seals and custom molded products, with experience that spans more than 150 years.

With over \$12 billion in annual sales worldwide and production facilities in 25 countries, there is no other truly global company that provides the same wealth of experience, products, and expertise. Yet despite the large size of our parent companies, one of Simrit’s greatest advantages in serving industrial customers is the capability to customize our sealing solutions to virtually any size and application. Simply put, our global resources only

strengthen our ability to provide superior products and services within your specific market. Simrit’s unique position as both leader and dynamic innovator in the sealing industry allows for the continual improvement of our products and services as we are discovering new materials and exploring advanced processes for the future. This is what Simrit stands for in the worldwide alliance of Freudenberg and NOK—your specialist for industrial sealing applications.



The Simrit Service Package

Simrit brings a unique combination of services to the global sealing industry. We are proud to set the standard for quality, reliability, and technological innovation.

World's Largest Product Range from a Single Source

Not only does Simrit offer the most extensive product range of sealing components worldwide, but we also deliver the goods where and when you need them, including custom seals and unique sizes for every application.

Our wide variety of products forms the basis of an integrated approach to your systems. Combined with our application expertise and market know-how, this constitutes a service package available only from Simrit.

- Over 500,000 cataloged part numbers
- Over 4,000 variations of shaft seals
- 11,000 standard dimensions in hydraulic and pneumatic components

Here you will find the perfect starting point for meeting your requirements in a cost-effective and integrated manner from a single supplier—Simrit.

Continuing Innovations in Sealing Technology

As your technology specialist, the ongoing development of new materials is a fundamental part of our company philosophy. This not only gives you competitive advantages through the development of more cost-effective and reliable systems, but also gives customers a technological advantage when entering future markets. We already offer numerous innovative solutions for environmental protection, including engine seals that reduce CO₂ emissions, materials to seal alternative fuels or refrigerants, and components for new energy sources such as fuel cells, wind turbines, and solar panels.

Simrit Materials Expertise and Manufacturing Quality

Whether your application calls for a standard material or a custom compound blended specifically for your needs, Simrit's materials expertise rises to virtually any challenge. Our 500+ experts continually research and develop new compounds that achieve advanced resistance to aggressive chemicals, high pressures, and extreme temperatures.

Over 100,000 customers worldwide put their trust in Simrit's high quality standards. Whether in Argentina or Alaska, engineers rely on the uniform quality from over 100 production facilities all striving to exceed Six Sigma quality levels.

Integrated Services from Development to Deployment

From the very beginning, at the conceptual design phase of your systems, you will find your ideal partner in Simrit. Our on-site application engineers understand your needs while our dedicated design engineers match your needs to the product that will exceed your performance expectations. Throughout each development stage, Simrit accompanies you along the path to increased performance.

Our Global Network Brings You Superior Service

As a company of the Freudenberg and NOK Group, Simrit set the course for global cooperation back in the 1960s. Today the most up-to-date sealing products are available for our customers wherever they are needed. Our research centers in the Americas, Europe, and Asia develop solutions to precisely meet your requirements. This means global customer projects can be implemented quickly and efficiently. The continual knowledge transfer between our international teams of experts provides you with valuable insights on problems that may have already been solved under similar conditions in another part of the world.

The following pages provide an overview of some of our key markets. For more details, please refer to our market-specific brochures, which can be found at www.simrit.com.



Simrit's 55,000-square-foot Technology Center in Plymouth, Michigan, is a \$25 million marvel of state-of-the-art testing capabilities. As our engineers develop and extensively test materials in this lab, they are in constant collaboration with the finest chemists from lead centers throughout the world.

Aerospace Industry Sealing

Simrit takes the aerospace industry to new heights with a broad range of proven sealing solutions incorporating advanced materials and technological expertise.

Technological Challenges in Aerospace Industry Sealing

The story of aerospace technology is integral to the ongoing evolution of aviation. In our pursuit of traveling further, faster, and higher than was previously possible, the industry must continually find ways around severe environmental barriers. Extreme heat and cold, radical temperature fluctuation, pressure, moisture, ozone, and UV radiation are just a few of the hostile elements challenging aircraft design. In addition, the systems themselves include man-made compromises to design integrity with corrosive oils, fuels, de-icing fluids, and other hydrocarbon and synthetic solvents that add to the test of every successful flight. Furthermore, in today's business climate, economic considerations are also becoming crucial, and getting the job done within budgetary restrictions, weight/size limits, and maintenance timetables is essential. With so many critical aerospace applications dependent on the technology that seals them, and with the safety and sustainability of air travel hanging in the balance, it is clear that there can be no second-guessing the quality and integrity of your sealing systems.

Simrit Products and Materials for Aerospace Industry Applications

In addition to offering AMS-, MIL-, AS-, NAS-, NFL-, and NSA-approved materials, Simrit continues to develop unique materials for individual customer requirements and specific applications. Our lead center concept with dedicated manufacturing for one product line in one location provides our customers with the advantages of best-in-class material development, product design, and on-site testing.

Simrit Seal Design and Testing

Simrit's design expertise is equaled only by the extensive testing regimen that ensures the quality of the end result. Our CAD design offers extremely detailed rendering of not only individual parts, but also the surrounding components. Beyond that, Simrit's Finite Element Analysis (FEA) simulates the environmental conditions each seal will experience in actual operation. We verify results of the computer models through actual product testing. Test capabilities include:

- Fluid compatibility
- Temperature
- Air aging
- Pressures
- Static/dynamic testing
- Durability testing
- Fire tests
- Environmental testing
- Physical properties (tensile, elongation, modulus, compression set, etc.)

Simrit takes great pride in the exceptional results of the thorough testing done where it really counts: on the ground. Simrit quality certificates include: AS9100, EN9100, ISO 9000-2000, Nadcap, A2LA Laboratory, Qualifas, EASE, and many customer-specific approvals. Simrit materials meet and exceed AMS, MIL, AS, NAS, NFL, and NSA specifications.

Simrit Seals for Aerospace Industry Applications

Aircraft Engine Sealing

- Plate seals
- Elastomeric ducting and shrouds
- Air inlet screens
- Vane grommets
- Fire seals
- Fuel seals
- Flexible transfer tubes
- Inlet and exhaust seals

Landing Gear Assembly Sealing

- Wheel and brake seals
- Actuator shaft seals
- Hydraulic seals
- Gearbox shaft seals

Airframe Sealing

- Aerodynamic seals
- Window, door, and hatch seals
- Interior/trim seals
- Firewall seals
- Elastomeric ducting and shrouds
- EMI seals

Fight Control Systems Sealing

- Hydraulic seals
- Gearbox shaft seals
- Electrical connector seals

Radial Shaft Seals

Simrit provides shaft seals in standard and non-standard sizes. Some special materials include: fluorosilicone (FVMQ), silicone (VMQ), and fluorocarbon (FKM). We supply special styles such as low-drag polytetrafluoroethylene (PTFE) and unique high-speed designs.

Silicone Products

Whether your operating temperature is extreme hot or cold, Simrit's fuselage seals and high-temperature seals ensure security. Simrit provides fire-resistant and fireproof products developed with flame-retardant formulations, fabric reinforcement, and proprietary fireproof silicone.

O-Rings and Plate Seals

Simrit offers off-the-shelf availability for standard AS568 size O-rings. We provide ISC O-rings in a wide range of AMS-, MIL-, AS-, and NAS-approved materials from NBR, EPDM, silicone, fluorocarbon and fluorosilicone to our proprietary **Simriz®** perfluoroelastomers. Simrit also offers a variety of specialized plate seals for the aerospace industry consisting of certified materials including the elastomers mentioned above.



Agricultural and Construction Machinery Sealing

Whether you're planting, harvesting, or up to your elbows in construction, Simrit provides sealing expertise and innovative solutions that keep you operating.

Technological Challenges in Agriculture and Construction Sealing

Growing and building—it's no coincidence that these earth-moving enterprises share similar elements and challenges. From the mission-critical time limits imposed by seasonal harvests to the high-pressure schedules of today's construction industry, there can be no doubt that time is money. When there is no room for error, it is vital that machinery and systems used for farming and construction resist and endure the extreme threats that are all too common in their work environments. Moisture, harsh weather, radical temperature fluctuation, extended UV radiation, and natural contaminants such as sand, fiber, and ozone are just some of the trials put to a system's integrity. In addition, systems themselves may contain elements which can compromise the design integrity, such as corrosive oils and fuels. With so many challenges to consider, Simrit serves as a firm foundation for critical sealing systems.

Engine System Sealing

With their wide range of applications, diesel and gas engines in agricultural and construction equipment depend on reliable components that survive even the most adverse conditions. With robust designs and the highest quality standards, Simrit seals provide reliable operation and ensure long service life and maximum cost efficiency. And when regulations call for reduced emissions, Simrit sets the standard in research and development for tomorrow's technological demands. With Simrit seal components, combustion systems can be optimized to exceed regulatory demands. Whether it is low friction crankshaft seals, flow-controlled valve stem seals, or specialty-coated O-rings, Simrit supplies sealing solutions from one end of the engine to the other.

Hydraulic System Sealing

Higher pressure, severe temperatures, and heavy working loads are standard operating conditions for hydraulic cylinders in today's world. No matter what the application demands, Simrit can provide the most durable components. **Disogrin**® polyurethane materials set the benchmark for cylinder sealing. **Disogrin** 9250 is well known for its longevity and resistance to abrasion. **Disogrin** 7695 provides excellent hydrolysis resistance, a must for environmentally friendly hydraulic fluids. Our new urethanes U641 and UH05 offer industry-leading temperature capabilities of 110°C and 120°C, respectively. When it comes to sealing entire cylinders, Simrit can be your first and last stop.

Simrit Seals for Agricultural and Construction Applications

Engine Seals

- Radial shaft seals
- Valve stem seals
- Die-cut gaskets, including PTFE
- Encoders
- **Plug & Seals**
- Patented crankshaft seal designs
- Special two-piece valve stem seals
- High-performance cassette seals
- Floating seals
- **Fas-N-Seal**™ fastener seals
- Metal or plastic carrier gaskets with void volume seal/groove design, or edge-bonded sealing
- Reed valves for exhaust/emission regulation

Cylinder Seals

- Rod seals
- Piston seals
- Wiper seals
- Wear rings
- Backup rings
- O-rings

CASCO Cassette Shaft Seals

The CASCO seal integrates sealing elements and their contact surface in a single cartridge that press-fits into the bore. Unlike many seal concepts, the main lip is axially loaded. Developed to extend seal life, CASCO also lowers friction torque and power loss.

Floating Seals (Track Roller Seals)

Simrit floating seals are noted for their reliable seal endurance characteristics. In laboratory tests simulating actual field service conditions (i.e., muddy water) at 1 m/s for over 1000 hours, track roller assemblies showed no leakage and essentially no seat wear, using standard 80W-90 gear oil as the lubricant.

Fluid Power Products

Simrit provides a large variety of fluid power products in standard and non-standard sizes. We stand by our superior customer service and world-class brands, including: **Disogrin**® polyurethane materials, **Quantum**™ PTFE materials, Simrit Xpress™ seals, **Disogrin**® O-rings, and hydraulic components.



"The highest product quality is the measure of all things here, as far as we and our customers are concerned, and we mean this right down to the smallest detail. That's why we chose Simrit as our sealing partner."

— Gary Bell, Group Chief Executive, Bell Equipment, South Africa



Semiconductor Industry Sealing

Simrit understands the needs of this high-tech industry. As a technology leader, Simrit has the necessary experience to provide seals that keep your production running.

Technological Challenges in Semiconductor Industry Sealing

Encapsulating the power to move information at virtually instantaneous speeds, semiconductors clearly don't become a reality by accident. Yet, throughout such a uniquely high-precision and volatile creation process, the potential for accidents is all too real. Extreme chemicals, temperatures, and highly corrosive materials are just some of the ongoing hazards, as are the constant threats of contamination and leaks. Ultimately, the stability of the entire manufacturing process depends on the integrity that seals the actual systems. Seals that swell, deteriorate, or outgas can be disastrous. The wet and dry phases of manufacturing also present specific demands on seals, requiring chemical resistance and low extractables versus high plasma resistance with low particulation, respectively. These are exacting orders for any industry, but particularly for one in which a single manufacturing cycle can take weeks and an hour of downtime can cost thousands of dollars. Clearly, the quality of sealing solutions in this environment cannot be left to chance.

Simriz® Perfluoroelastomer O-Rings



Simrit Products and Materials for Semiconductor Industry Applications

The Simrit advantage starts with our super-premium base polymers and the expertise that perfects them. The benefits of our streamlined process are unequalled focus and efficiency, from base polymer manufacturing to compounding to molding, which results not only in cost-effective sealing solutions but also in exceptional cleanliness. Our materials start out clean and stay that way because of our class 1000 clean-room manufacturing, with Class 10 cleaning and packaging processes.

Simrit Seals for Semiconductor Industry Applications

Simrit Semiconductor Sealing Materials

- **Simriz®** perfluoroelastomer compounds
- **Superior™** enhanced fluoroelastomer compounds
- **Liqui-Last™** liquid elastomers
- Fluoroelastomers in fluorocarbon and fluorosilicone
- Other materials include silicone (VMQ), hydrogenated nitrile (HNBR), and nitrile (NBR)

Semiconductor Testing Capabilities

- Atomic absorption
- Atomic force microscopy
- Chromatography
- DMA
- DSC
- Energy dispersive X-ray spectroscopy
- FTIR
- Mass spectroscope
- Particle counter for plasma unit
- Permeation
- Plasma testing
- Scanning electron microscope
- TGA
- Thermal analysis
- X-ray fluorescence

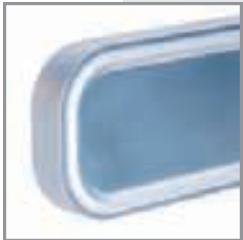
O-Rings

Designed for thermal stability and nearly universal protection against chemical attack, our proprietary family of **Simriz®** perfluoroelastomer compounds offers premier sealing performance. Simrit is the single-source developer of **Simriz**, thus ensuring complete oversight and eliminating any need for costly outsourcing.



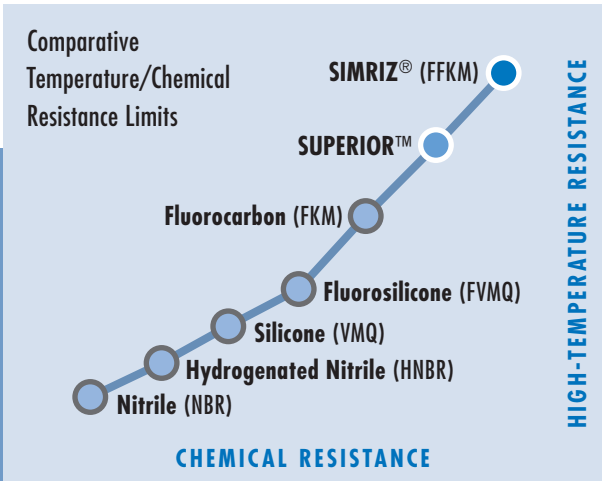
Bonded Gates

Through a unique manufacturing process, seal profiles are bonded directly to process chamber gates. This allows for less seal movement, reducing contamination in process. Available in a wide range of compounds from FKMs for mild chemical processes to advanced **Simriz** perfluoroelastomers (FFKM) for the most aggressive and particulation-sensitive environments.

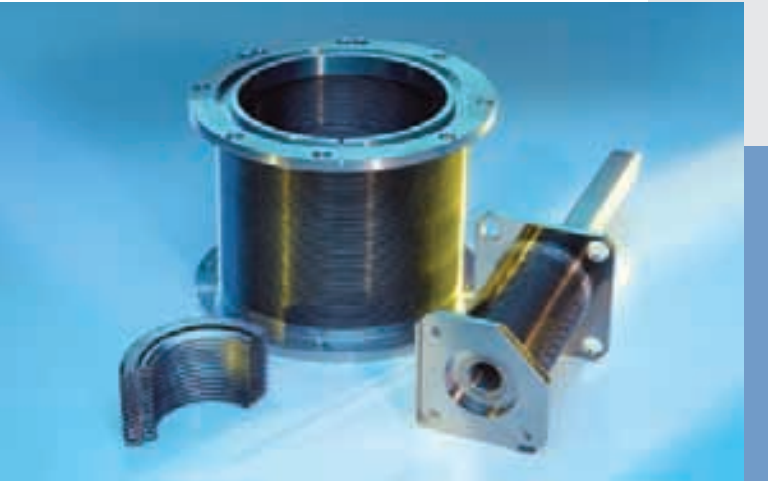
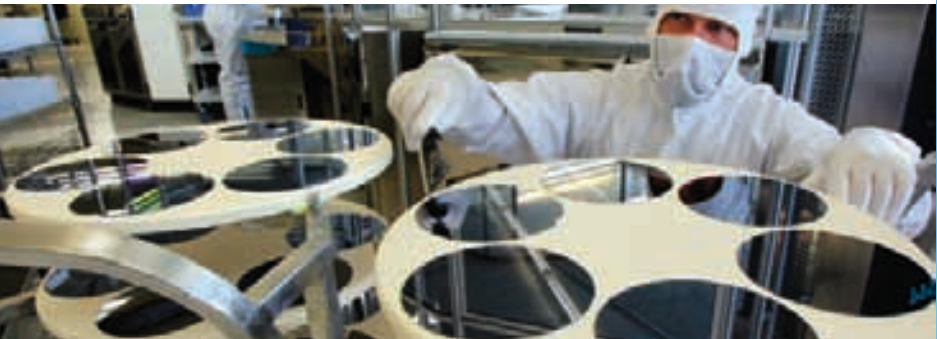


Magnetic Fluid Seals

Simrit offers a complete array of options to meet ferrofluidic demands, including: axial, multi-axial, and linear translating designs, available metal bellows, excellent high-temperature capabilities, low vapor pressure, proprietary magnetic fluid and bearing lubrication, and in-house R&D and testing.



The chemical/high-temperature resistance comparison at left demonstrates that Simrit's proprietary **Simriz®** perfluoroelastomer compound with a high-temperature limit of 610°F (320°C) offers a clear sealing advantage in demanding application environments.



Heavy Duty Truck Sealing

Simrit offers sealing products that are designed to deliver the highest reliability, performance, and value over the long haul.

Technological Challenges in the Heavy Duty Truck Market

From the over-the-road, heavy duty truck application to the multitude of other vocational truck applications, commercial vehicles depend on reliable components that continue to operate under the most adverse conditions. Simrit sealing products guarantee faultless operation of all heavy duty truck applications. At the same time, they provide for increased long-term performance and cost efficiency. With its leading seal program for the entire heavy duty truck industry, Simrit provides innovative products that reflect the latest technological developments for the commercial vehicle industry. You receive the optimal solution for any heavy duty truck application from a single source.

Simrit Products and Materials for Heavy Duty Truck Applications

Simrit demonstrates reliability and performance through its policy of continuous improvement. Combining this experience with in-depth market knowledge, Simrit has developed sealing solutions that optimize the performance of all components found in heavy duty trucks. The benefits to our customers are longer service life, greater performance, and lowered cost per mile of operation—all with the advantages that Simrit offers as an innovative and global sealing specialist.

A step ahead in emissions reduction, Simrit sets the standard in research and development and offers solutions today for tomorrow’s technological demands. For example, the next generation of on-highway diesel engines must meet far-reaching emission-reduction regulations. With Simrit sealing components, combustion systems can be optimized to assist in meeting current and future regulatory developments, providing you with an “unfair” advantage.

Simrit Seals for Heavy Duty Truck Applications

Engine Sealing

- Crankshaft seals
- Valve stem seals
- **Plug & Seals**
- Water pump seals
- Turbocharger seals
- Oil pan gaskets
- Intake/Exhaust gaskets
- Water coolant gaskets
- Cylinder liner seals
- EGR gaskets
- Fuel injection O-rings and backup seals

Transmission Sealing

- Input/Output seals
- Gaskets and O-rings
- Bonded piston seals
- Magnetic encoders

Drive Line/Axle Sealing

- Input/Output pinion seals
- Wheel seals
- King pin seals
- Gaskets
- U-joint seals
- Drive shaft boots

MileMaker™ Seals

The **MileMaker** heavy duty wheel seal is designed for today’s high-performance trucks. Our unique design and material combine to deliver both increased temperature resistance and reduced drag, resulting in a superior seal that delivers exceptional durability and fuel efficiency. The payoff for customers: “More miles, less money.”

Plug & Seals

Plug & Seals are rubber-coated pipe sections that create a safe, leak-free connection between housings. A secure, low-cost solution for the transport of air, water, and oils, they can combine several functions in a single component and compensate for conduit misalignment and tolerance variations. **Plug & Seals** are available in a wide variety of elastomer coatings.

Magnetic Encoders

Active elastomeric encoders utilize a proprietary formulation of a ferrite-loaded polymer molded and magnetized to a specified pole pair configuration. This compact design provides exceptional crankshaft seal and sensing packages. Simrit magnetic encoders offer greater air gap sensitivity, maintain signal quality at all speeds, and demonstrate consistent digital output down to zero speed.



“We at EMP develop ground-breaking cooling and oil systems for diesel engines to optimize performance. Utilizing Simrit as our expert partner in sealing technology, it is possible to achieve these goals. Their R&D capabilities provide us today with the sealing standards required to deal with the demands of tomorrow.”
— Bob Sims, Quality Manager, Engineered Machine Products, USA



Renewable Energy Sealing

Simrit is helping power the development of future energy sources. With sealing for solar, wind, water, and geothermal energy generation applications, Simrit leads the way in new energy markets.

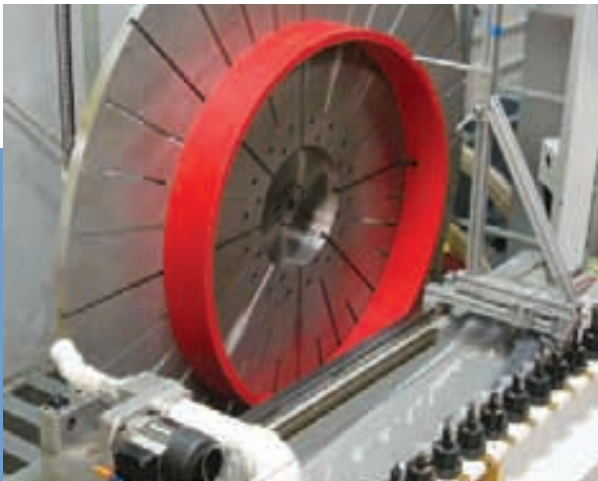
Technological Challenges in the Renewable Energy Market

When it comes to renewable energy, the less maintenance, the better. No one wants to service an offshore wind system twice a week. Likewise, solar generating systems are subjected to intense thermal loads but must provide reliable and consistent performance. Not only do these systems undergo incredible stresses and repetitive wear and tear, they often do so under the most extreme conditions and in unforgiving, hostile environments. When dealing with large machinery, there is no such thing as a small problem. Downtime costs thousands of dollars per hour. Failures lead to lapses in the supply of energy that can have repercussions on entire communities and economies. By overcoming the challenges of ozone and UV environments, Simrit sealing components help to make the future clear.

Simrit Products and Materials for Renewable Energy Applications

From hydraulic seals for brake systems and cylinders to mounting seals to vibration dampers for drives and generators, from standard solutions to customized components, every offering in Simrit's broad range of products allows reliable protection in all important systems at a uniformly high level of quality. And we continue to create innovative solutions, like **Lube & Seal** from Simrit and Klüber Lubrication, two specialists within the Freudenberg Group. **Lube & Seal** demonstrates the perfect compatibility of sealing material and lubricant. This technology expertise is used to prevent malfunctions, and extend maintenance intervals, keeping systems productive.

Whether inland in the mountains of California or offshore in the Wadden Sea of northern Germany, as the world's leading technology specialist we are there where you need us—and we're there for you very quickly. Our international application specialists will directly solve your individual requirements for specific materials and dimensions. Development and manufacturing processes for customized applications start with services like Simrit Xpress, a method of quickly and reliably accelerating machining production. As a Simrit customer you can be sure of having the right solution quickly and at the right location.



Simrit Xpress™ is our rapid prototype and low-volume production cell, capable of producing custom-designed seals up to 116 inches in diameter. Capabilities include over 200 standard designs in a variety of materials including PTFE, PEEK, polyurethane, and many rubber compounds.

Simrit Seals for Renewable Energy Applications

Wind

- Rotor seals
- Tower and blade bearing seals
- Hydraulic blade positioning and brake seals
- Vibration and noise-reduction mounts
- Pivoting bearing profile seals
- Gearbox and motor seals

Solar

- O-rings
- Custom-molded connector seals

Hydroelectric

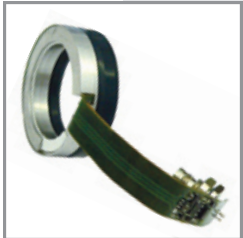
- Hydraulic cylinder seals
- Gearbox seals

Geothermal

- Pump seals
- Connector seals
- Specialty O-rings
- Custom molded sealing elements

Radial Shaft Seal Sensors

Radial shaft seals can be equipped with leakage sensors that can detect and analyze leaks, automatically notifying a remote monitoring system.



Hydraulic Rod and Piston Seals

Hydraulic applications in wind turbine braking and pitch adjustment systems demand uncompromising functional reliability. Hydraulic components from Simrit are designed to keep windmills and turbines turning.



EPDM Sealing Elements

Our proprietary EPDM material developed by Simrit represents an extremely temperature-resistant solution for O-rings and molded components. The EPDM material exhibits impressive sealing properties in long-term use in extreme ozone and UV environments.



Simrit Products for Process Industries

With highest purity and media resistance, Simrit products perform in process industries applications.



O-Rings

Simrit O-rings feature NSF-, USP Class VI-, and FDA-certified materials, including **Simriz®** 484 perfluoroelastomer material, for the most demanding applications.



Diaphragms

Simrit produces diaphragms ranging from homogeneous and fabric-reinforced silicone and fluorosilicone to PTFE-coated diaphragms for superior chemical resistance.



Solenoid Valve Plunger Seal

The precision molding of our solenoid valve plunger seal ensures accurate and reliable fluid dispensers without affecting beverage quality.

Simrit Products and Materials for Process Industry Applications

Custom Molded Products

- Core seals
- Oven door seals
- Butterfly valve seals

Diaphragms

- Pumps
- Metering equipment

O-Rings, Gaskets, and Plate Seals

- Pumps
- Valves
- Pipe fittings
- Pipeline flanges

Radial Shaft Seals

- Pumps
- Gearboxes
- Motors



Simrit Products for Power Transmission Sealing

With robust designs and the highest quality standards, Simrit seals provide faultless operation.

Simrit Products and Materials for Power Transmission Applications

Simrit's power transmission sealing product lines have been tested and proven to give superior service life.

Radial Shaft Seals

- Variety of designs, dimensions, and materials
- Robust components
- A high degree of operational reliability
- Cost-effective solutions
- Use in original equipment or maintenance and repair

O-Rings

- A large selection of standard dimensions
- Variety of materials
- In-house coating
- High levels of pressure resistance

Plate Seals

- High stress resistance
- Reliability
- Application flexibility, whether for terminal boxes, flanges between engines and transmissions, or to different gear speed combinations

Vibration Control Technology

- Reduce noise and vibrations within the drive line
- High standards of quality
- Long service life

MSS1+

This condition-monitoring radial shaft seal consists of a proven shaft seal design and integrated sensor. This sensor continually monitors the operating conditions including speed, temperature, and lubrication so preventative maintenance can be planned, reducing downtime.

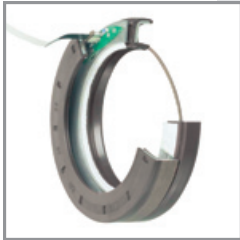


Plate Seals

Reliable static seals that can reduce the number of components needed and simplify housing machining. Simrit offers both groove-bonded and edge-bonded plate seals with a wide variety of elastomers, including our high-performance **Simriz®** perfluoroelastomers. Both silicone and fluorosilicone families of electrically conductive elastomers are available.



O-Rings

Simrit offers off-the-shelf availability for standard O-rings in AS568 sizes and can match an O-ring to customers' applications: Six Sigma dimensional capability, specialty polymers, high-temperature performance, and a multitude of particular chemical resistance requirements.



"In environments that are extremely harsh, Simrit seals excel. Even in the most challenging conditions, such as ethanol production or sugar processing, Flender drive systems perform over the long run. We depend on the security provided by Simrit sealing technology."

— William Pedrosa, Engineering Manager, Flender, Brazil



Simrit Sealing Solutions for Other Markets

There are multitudes of industries which depend on Simrit sealing. We won't let them down.



Simrit Delivers Quality Seals for Most Markets

Appliance Manufacturing

Washers, dryers, dishwashers, small appliances, ranges/ovens, kitchen and bath. Products include:

- Patented Zero Lash-Positive Drive mechanical face seals
- Radial shaft seals
- Custom-molded products

Outdoor Power Equipment

Lawn and garden equipment, snow blowers, small engines, and utility tractors. Products include:

- Crankshaft and valve stem seals
- Gaskets
- O-rings

Recreation

Small engines, ATVs, motorcycles, snowmobiles, bicycles, and marine engines. Products include:

- Engine and shock seals
- Gaskets
- O-rings
- Reed valves

Photo courtesy of FOX Racing Shox

Simrit Seals for Other Industry Applications

Simrit's drive to deliver solutions to our customers' needs applies across a vast spectrum of markets. No matter what your market, no matter what your application—whatever the problem is, Simrit will find a solution.

Unique Applications—A Case Study

The Problem

Simrit was approached by Sittris, a furniture manufacturer, with the concept of using silicone as a possible material for healthcare facilities seating. Silicone prevents fungal and bacterial growth, is UV resistant, and can be cleaned easily. The problem was how to mold silicone into a large, complex shape.

The Solution

Simrit worked with Sittris to develop an upholstery-type application using a "shower cap" design. This creative solution ensured an optimal seal at all joints to maintain the chair structure. In order to produce such complex moldings, Simrit acquired a custom-built liquid silicone injection-molding machine—the largest in the Americas—and developed an extremely tough, tear-resistant material with a distinctive skin-like feel that would withstand the constant use of public seating.



The Benefit

Simrit's liquid molding technology produces high-quality silicone components with tight tolerances and no flash. In diverse industries with unique elements and sealing challenges, Simrit is able to help their customers produce superior products by using creative problem solving and unique materials.

Reed Valves

Our rubber-covered reed valves deliver long life while reducing engine noise in today's fuel-efficient, low-emission, two-cycle engines.



Mechanical Face Seals

These provide reliable sealing in problematic water-usage applications. The patented Zero Lash-Positive Drive design eliminates "seal squeal" in appliance applications such as dishwashers and washing machines.



Diaphragms

Simrit diaphragms provide superior service life and reliable performance, including designs that maintain their function in over 6 million cycles. Simrit diaphragms include homogeneous, fabric-reinforced, and metal/plastic insert designs.



"Stihl products are directly linked with our natural surroundings. Our unique low-emission engines provide a distinct ecological advantage and Simrit's sealing design expertise ensures optimum performance. Innovative Simrit products put a reliable seal on our technology and our commitment to the environment."

— Harry Grandberg, General Director, Stihl, Brazil



A World of Service at Your Fingertips

Simrit's commitment to excellence extends far beyond the products themselves. We are dedicated to superior service, ensuring an unrivaled positive customer experience.

Engineering Expertise

Our field staff of regionally based Application Engineers provides on-site engineering support and can help diagnose the entire system, not just the individual parts. In the event of a premature sealing failure, engineers conduct failure analysis tests to determine not only why a part did not perform up to standards, but also how to prevent that situation from happening again, providing a Simrit sealing solution in each case.

Dedicated design engineers located in each lead center ensure that the best possible design goes into each part. They specialize by product line to match the best design, materials and processes to your performance expectations.

Finite Element Analysis (FEA) is used to study a part as it will actually be used in the application. Computer models simulate wear and performance to accurately predict product life. Design elements can be adjusted before a part is ever sampled, saving both time and money.

Customer Service

Highly trained customer service specialists are ready to provide you with availability, pricing, and other helpful information about Simrit products. Our mission in serving you is to guarantee 100% satisfaction with every transaction.

World Wide Web Access—www.simrit.com

Our website allows access to Simrit 24 hours a day, seven days a week, with all the tools you need to search and research parts, plan your purchasing, track orders, and manage your account. Website features include:

- Approximately 500,000 cataloged parts
- Direct access to Simrit Xpress™
- Part drawings and dimensions in printable format



- Availability and pricing for each part number
- Material properties and chemical compatibility tables
- Search engines for finding parts by dimension, part number, or cross reference
- Over 250,000 cross-reference numbers
- Fully detailed account management features
- Order placement and tracking

To ensure the reliability of our innovative new COP 3038 rock drill, we use sealing elements from Simrit. They have the world's largest product range and offer the best solutions for our diverse applications—from hydraulic seals to diaphragms.

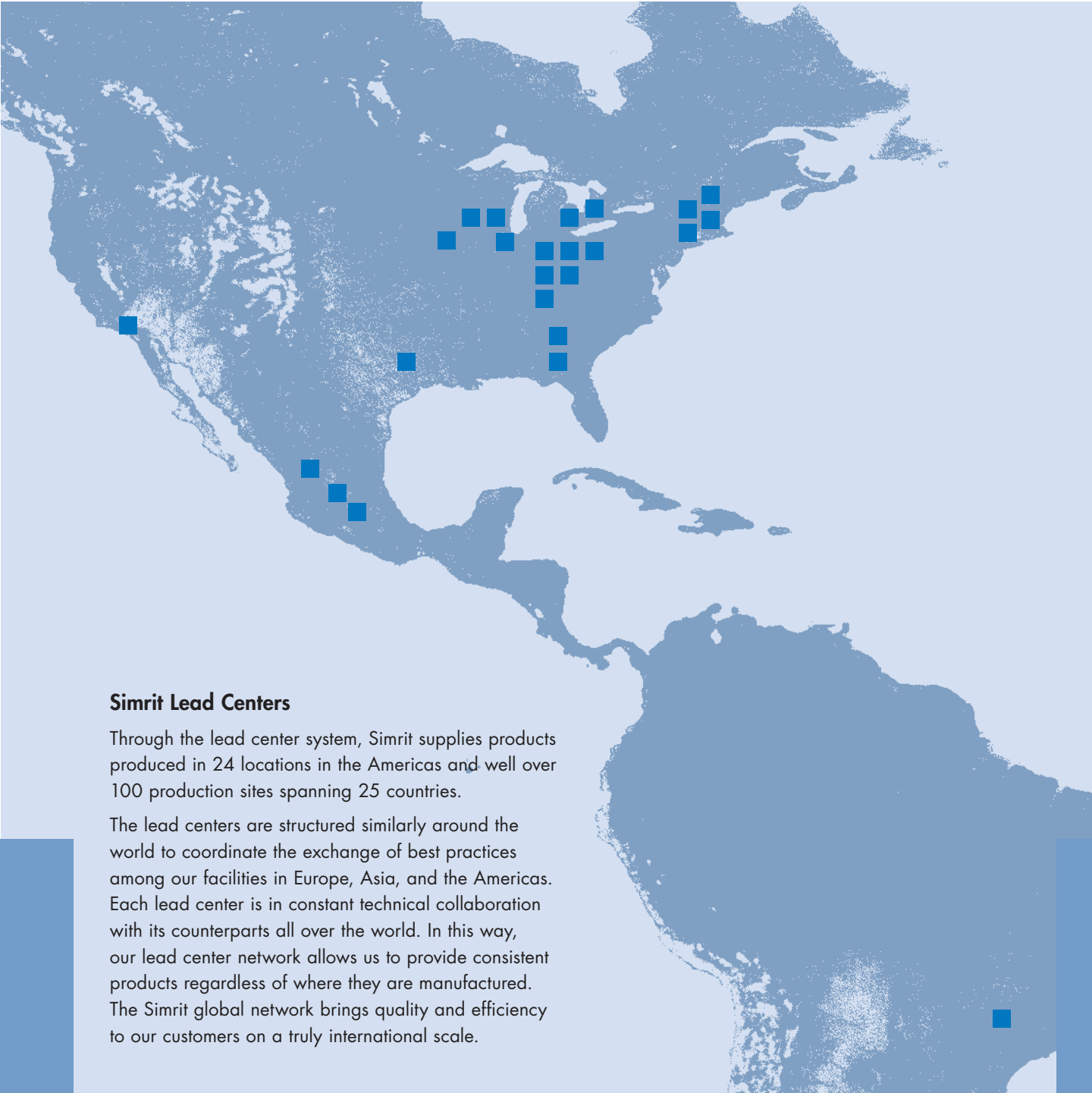
— Lasse Persson, R&D Manager, Rocktec Division, Atlas Copco, Sweden



Simrit's Global Network is Working for You

Simrit's global network is built around the concept of the lead center, a factory that focuses on a particular product family. With full ownership of their product line, lead

centers feature design engineering, material expertise, and production excellence, offering our customers the industry's most consistent products and services.



Simrit Lead Centers

Through the lead center system, Simrit supplies products produced in 24 locations in the Americas and well over 100 production sites spanning 25 countries.

The lead centers are structured similarly around the world to coordinate the exchange of best practices among our facilities in Europe, Asia, and the Americas. Each lead center is in constant technical collaboration with its counterparts all over the world. In this way, our lead center network allows us to provide consistent products regardless of where they are manufactured. The Simrit global network brings quality and efficiency to our customers on a truly international scale.

Simrit Products—Always First in Quality

Simrit offers the most comprehensive range of products available in the market today. Each product line is manufactured with our uncompromising commitment to the highest possible quality.

Fluid Power Products



O-Rings



Gaskets and Plate Seals



Specialty Sealing Products



Radial Shaft Seals

- 40,000 tooled inch and metric sizes
- Both metal and rubber O.D. designs
- Low-, medium-, and high-pressure designs
- Special large-diameter seals
- Spring-energized PTFE seals

Fluid Power Products

- 280,000 inch and metric part numbers
- Featuring **Disogrin®** polyurethanes
- Complete cylinder sealing
- Robust designs and materials for long sealing life

O-Rings and Simriz® Compound Products

- Featuring proprietary **Simriz®** perfluoroelastomers
- AS568 sizes available from stock
- Clean room manufacturing
- Six Sigma quality levels
- AMS-, NAS-, MIL-, NSF-, FDA-, USP Class IV-, SAE-, ASTM-, WRC-, KTW-, and UL-approved materials

Gaskets and Plate Seals

- Edge-bonded gaskets
- Screen-printed and flat-cut gaskets
- Custom elastomeric gaskets
- Plate seals with single, double or triple sealing beads
- Multiple plate materials available

Specialty Sealing Products

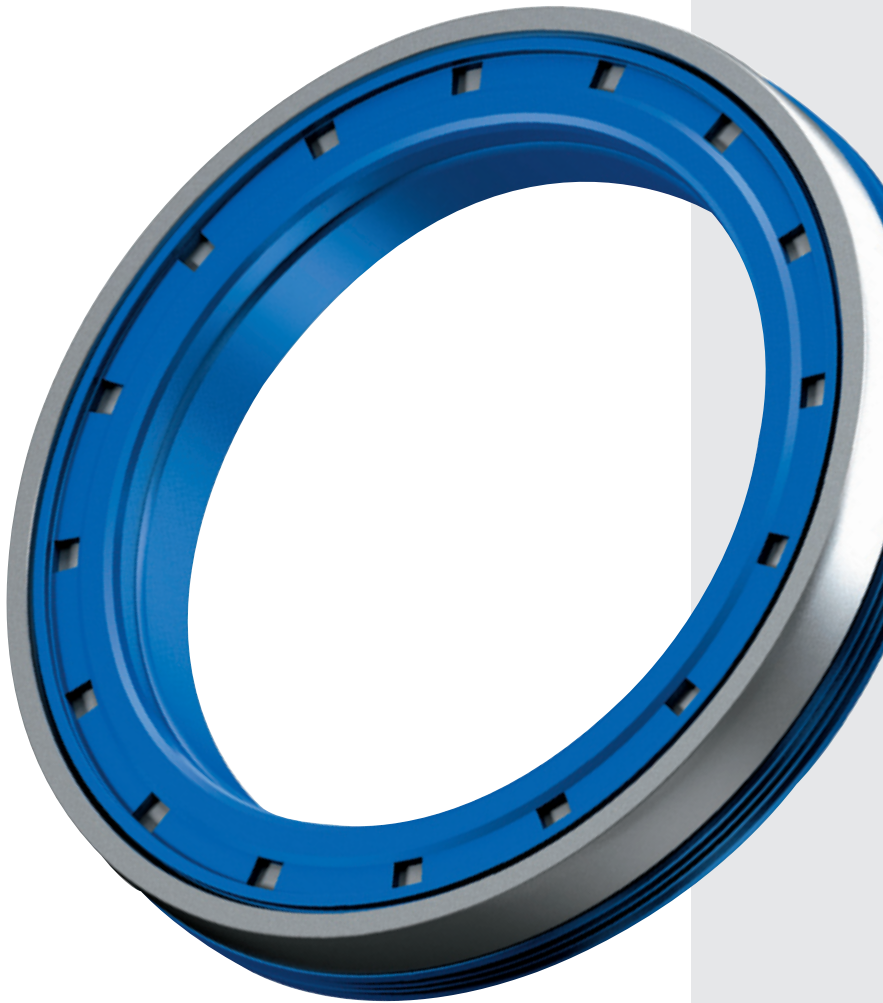
- Patented **Plug & Seal** connectors
- Fuel system parts
- Grommets
- Boots and bellows
- Custom shapes

Diaphragms

- Homogeneous or fabric-reinforced
- Metal inserts
- Over-molded custom designs
- PTFE coated for severe applications
- Expert engineering capabilities

Other Products

- Valve stem seals
- Mechanical face seals
- Floating seals
- PTFE-bonded pistons
- Reed valves
- MCU bounce bumpers
- Vibration control devices



Please visit www.simrit.com for a full overview of all our product offerings, or call 1 (866) 274 6748 with any questions you may have about Simrit products and services.

Floating Seals



Diaphragms



Simrit Americas

Plymouth, Michigan, USA

Tel: +1 (866) 274 6748

Fax: +1 (734) 354 5500

Simrit Europe

Weinheim, Germany

Tel: +49 (0) 18 05 – 746748

Fax: +49 (0) 18 03 – 746748

Simrit China

Shanghai, China

Tel: +86 (21) 50 36 69 00

Fax: +86 (21) 50 36 63 07

www.simrit.com

