



Agriculture and Construction Industry Sealing Solutions

Your Technology Specialist

simrit[®]

Simrit Sealing Solutions for Agriculture and Construction

Growing. 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 challenges 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 critical agriculture and construction applications dependent on the technology that seals them, it is clear that there can be no second-guessing the quality and integrity of your sealing systems.

Welcome to the unrivaled power of Simrit Agriculture and Construction.

Simrit is the industrial sealing products division of the Freudenberg and NOK Group Companies, the world's largest supplier of elastomeric seals and custom-molded products, with over \$12 billion in annual sales worldwide. Simrit provides customers with unmatched experience, product availability, and expertise in the fields of agriculture and construction—and beyond. Industrial customers, OEMs and distributors alike, know that one of Simrit's key advantages is the ability to customize our total sealing solutions to virtually any size and application. In fact, it is the breadth of our global resources that enables us to focus personally on a customer's individual needs within specific markets and particular applications.

As both leader and dynamic innovator in the sealing industry, Simrit's unique position allows for the continual improvement of our products and services. We are dedicated to discovering new materials and exploring advanced processes to help your technologies not only grow, but thrive.

The Simrit service package at a glance:

World's largest product range—Superior design solutions from a single source.

Continuous innovation—Technological prominence gives our customers competitive advantage.

Unique expertise in materials and high-quality standards—The end-to-end leader for safe, cost-effective applications.

A vast range of integrated services—Holistic support from development through product deployment.

"Globality"—Global expertise united with the knowledge of local market requirements and customer demands.



Simrit Manufacturing Quality

Simrit continues to offer product availability, engineering expertise, and advanced technology that far exceeds industry standards.

Lean Manufacturing and Six Sigma Quality

Simrit manufacturing is exceptionally lean, which reduces in-process inventory and waste while increasing product quality. Focusing on individual parts as opposed to batch processing, we can isolate problems and affect corrections without jeopardizing an entire production run. Simrit often adds state-of-the-art automated vision systems to the manufacturing process to further enhance its obsession with quality. These machines identify flaws undetectable to the human eye. Simrit quality certificates include: ISO 9001:2000, ISO 14001, QS9000, ISO-TS-16949, and many customer-specific approvals.

Product Testing and Design

Simrit's design expertise is surpassed only by the extensive pre-production analysis and attention to detail that ensures the quality of the end result. Our CAD 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. This modeling lowers cost, speeds the development process, and provides a more robust part than just making prototypes and testing them. Ultimately, our detailed failure analysis capabilities can determine the root cause of any part failure. This may include identifying a contaminant or a stress source, thus enabling us to adjust the seal design and provide an optimized sealing solution.

Product testing includes:

- Physical properties (tensile, elongation, modulus, compression set, etc.)
- Fluid compatibility at temperature
- Environmental aging

- Static/dynamic testing at accelerated conditions
- Durability testing
- Fire tests

Introducing Simrit Xpress™—Part Production Cell, Part Time Machine

When schedules are tight, the task of getting a customized part designed and affordably produced can seem daunting or even unrealistic. Not anymore. **Simrit Xpress™** is our rapid prototype and production cell which is literally redefining the way our customers think about producing their designs. Conceived as a cost-effective solution for low-quantity production or rapid prototypes, Simrit Xpress is a Computer Numeric Control (CNC) machine, integrated with computer software, to custom-produce seals—usually in less than one day. There are no mold charges.

On-line access makes it quick and easy to design your own products or choose from nearly 200 standard designs. Select the perfect Simrit material from the dozens available and in stock. Best of all, you can typically have your custom parts shipped within 24 hours. And it all starts at www.simrit.com.

www.simrit.com—Your Connection to The Global Manufacturing Advantage

Simrit provides global technology and sales support to all of our customers. Your key to Simrit worldwide accessibility and creative sealing solutions is www.simrit.com, our full-service website featuring client log-in, order tracking, and expert support. Moreover, it's where you can instantly access the complete catalog of approximately 500,000 Simrit parts featuring over 250,000 cross-reference numbers. Or learn more about specific products for your industry by quickly downloading any of our detailed brochures. And when your demands include custom parts, or special orders, www.simrit.com is your portal to Simrit Xpress services.

Simrit Xpress™ is Simrit's rapid prototype and low-volume production cell, which is capable of producing custom-designed seals, typically in less than 24 hours. Capabilities include over 200 standard designs in a variety of materials including PTFE, PEEK, polyurethane, and many rubber compounds.



Simrit Seals for Agriculture and Construction Applications

Simrit is proud to provide the very best quality, most reliable sealing products available. Our real-time inventory and short manufacturing lead times ensure the fastest

possible delivery. To learn more about Simrit's sealing solutions for agriculture and construction, please call us at **1-866-2SIMRIT**, or visit **www.simrit.com**.

ISC O-Rings

Simrit offers off-the-shelf availability for standard O-rings, and can match an O-ring to your application, whether it needs Six Sigma dimensional capability, a specialty polymer, or the high-temperature capability and chemical resistance of a perfluoroelastomer. We also supply **Disogrin®** polyurethane O-rings, the highest standard in the industry for toughness, tear strength, reliance, extrusion resistance, and compression set, providing positive, leak-free sealing up to 10,000 psi. Simrit O-ring materials also include:

- Ethylene propylene (EPR/EPDM)
- Fluorocarbon (FKM)
- Fluorosilicone (FVMQ)
- Hydrogenated nitrile (HNBR)
- Liqui-Last™ (pFKM)



- Nitrile (NBR)
- Silicone (VMQ)
- **Simriz®** perfluoroelastomer (FFKM)

Fluid Power Products

Simrit provides a large variety of fluid power products in standard and non-standard sizes, with standardized cross-sections. We stand by our superior customer service and world-class brands, including:

- **Disogrin®** polyurethane materials

- **Quantum™** PTFE materials
- **Simrit Xpress™** seals
- **Disogrin®** O-rings
- **Merkel** hydraulic components

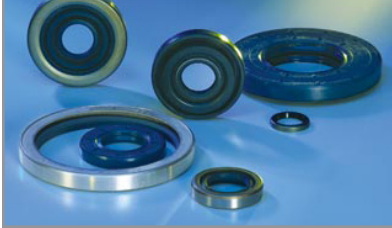
*New UH05
Urethane Seals*



Simrit sets the world standard for material innovation. With today's hydraulic systems demanding higher seal performance, Simrit rises to the challenge with two new materials. These new urethane compounds, UH05 and U641, provide greater temperature resistance (to 120°C) while standing up to bio-fuels and resisting hydrolysis and glycolysis. For more information on these new materials, visit us at www.simrit.com.

Complete Internal Engine Sealing Solutions from Simrit

Radial shaft seals



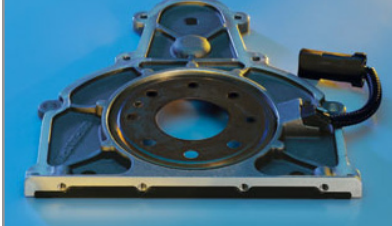
Valve stem seals



Gaskets



Encoders



Plug & Seals



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 faultless 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.





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.

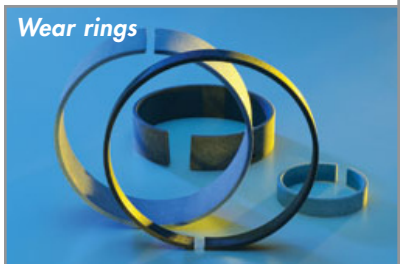
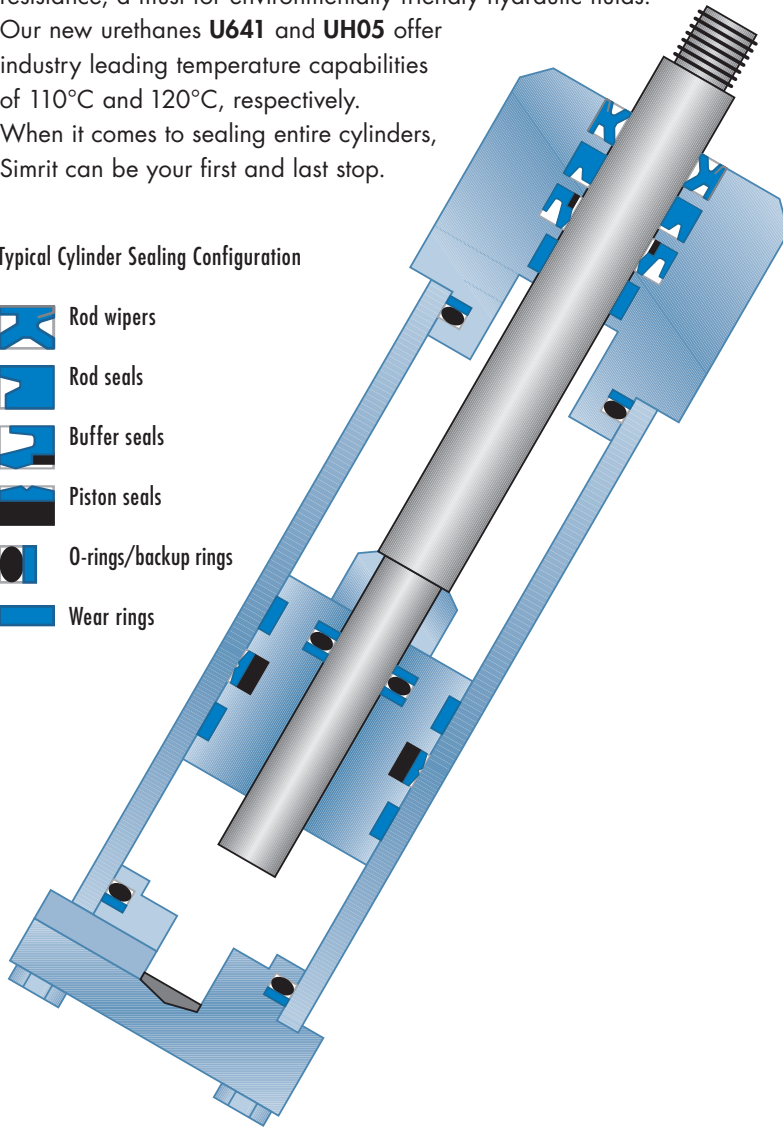


Complete Cylinder Sealing Solutions from Simrit

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.

Typical Cylinder Sealing Configuration

-  Rod wipers
-  Rod seals
-  Buffer seals
-  Piston seals
-  O-rings/backup rings
-  Wear rings



Plug & Seals. Designed as rubber-coated pipe sections, Plug & Seals create a safe, leak-free connection between housings. Reliable even under high pressure, Plug & Seals are 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.

Simrit Seals for Agriculture and Construction Applications

Plate Seals and Gaskets

- Metal or plastic carrier gaskets with void volume seal/groove design, or edge-bonded sealing
- Available materials include ethylene propylene (EPR/EPDM), fluorocarbon (FKM), fluorosilicone (FVMQ), nitrile (NBR), silicone (VMQ), and **Simriz**[®] perfluoroelastomer (FFKM)
- Metals include aluminum, stainless steel, and chrome molybdenum steel
- Die-cut gaskets, including PTFE
- **Fas-N-Seal**[™] fastener seals product line



Shaft Seals

Simrit provides shaft seals in standard and non-standard sizes in a wide variety of materials.

- Patented crankshaft seal designs
- PTFE crankshaft seals
- Special two-piece valve stem seals
- High-performance cassette seals
- Track roller seals



Specialty Sealing Products

An exceptional range of unique sealing products is available from Simrit, including:

- **Plug & Seal** connectors
- Diaphragms
- Molded shapes
- Grommets
- Integral accumulators
- Boots/bellows
- Silicone/fluorosilicone self-fusing tapes



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