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Intelligent depowdering: Solukon launches SPR-Pathfinder® software

Solukon will present the automatic depowdering software to the public at Formnext 2022. By commercializing the software as its own product, the Augsburg company, Solukon, reinforces its role as a pioneer in the industrialization of automatic depowdering. Furthermore, with the SPR-Pathfinder®, Solukon makes the digital twin of a part usable in postprocessing for the first time.

The increasingly complex applications of powder-based 3D printing have led to increasing demands on industrial depowdering. After introducing its Digital-Factory-Tool last year, a sensor and interface kit for quality assurance and automation integration, Solukon is taking the next step in 2022. The Augsburg company is launching the SPR-Pathfinder® depowdering software on the market.

To remove excess powder from complex internal structures, SPR-Pathfinder® uses the build job's CAD file to calculate the ideal motion sequence in the Solukon system. The SPR-Pathfinder® calculations are based on a flow simulation that analyzes the part's digital twin. The individually calculated motion sequence is then read by the Solukon system, which in turn runs the programmed paths. This ensures that even the most complex parts are cleaned—in record time and without any human programming effort. "In contrast to conventional manufacturing processes, 3D printing uses the part's digital twin. To date, however, this was only utilized during the printing itself. With SPR-Pathfinder®, the part's digital twin can now also be used during depowdering. This is how we ensure that the potential of the digital twin can be used to the fullest in postprocessing as well," says Andreas Hartmann, CEO/CTO of Solukon.

Experienced depowdering pioneer acquires license for award-winning depowdering software

In 2018, the software developed by Siemens Technology in a joint project with Solukon was unveiled publicly for the first time under the name SiDAM. The software was the brainchild of Dr. Christoph Kiener, Principal Key Expert on Functional Design for Manufacturing at Siemens Technology. "Vibration-excited powder behaves almost like a fluid when it flows out. That's how we quickly realized that we could find success by using path identification as well as particle and flow simulation in the software," says Kiener. Even back then, the announcement caused a sensation when Solukon and



Siemens received the TCT Postprocessing Award 2019 for their use of the software in a Solukon SFM-AT800-S.

Until recently, the software prototype was only available to a select number of Siemens' and Solukon's development partners. Now, Solukon has acquired exclusive rights to the software, developed it into a Solukon product, and is bringing it to the AM market under the new name, SPR-Pathfinder®, enabling Solukon customers to purchase licenses for the first time. "It's a logical step for us to license the depowdering software exclusively to Solukon, thereby enabling the pioneer in industrial depowdering to offer the market an even more effective product," says Dr. Georg Bodammer, Senior Venture Director at Siemens Technology Accelerator. "This way, customers can get everything from a single source: the market-leading depowdering system and the exclusive, intelligent software."

In naming the software, Solukon deliberately drew on the established depowdering technology Smart Powder Recuperation, also known as SPR®. SPR® generally involves automated rotation on two axes as well as adjustable vibration in a safety-controlled atmosphere. The algorithm-based SPR-Pathfinder® calculates the ideal motion sequence for the most complex geometries, finding the best path to allow the powder to flow out completely.

SPR-Pathfinder® available now

As an exclusive Solukon product, SPR-Pathfinder® is only compatible with Solukon depowdering systems. The software can currently run on SFM-AT800-S and SFM-AT1000-S models—already starting with serial number 1 of those models. "It is very important to us that the widest possible customer base can benefit from our software from the moment it hits the market," says Andreas Hartmann, CEO and CTO at Solukon. In the future, the software should also be compatible with other models, such as the SFM-AT350.

SPR-Pathfinder® runs as on-premises software—in other words, on the respective company's own devices (PC or notebook), not in the cloud. Each license is bound to a device and is always valid for the current version at the time of purchase.

What's more, interested Solukon customers have the option to test SPR-Pathfinder® free of charge and without obligation. Interested parties can register for a 30-day trial version on Solukon's website.



Depowdering software already validated by pilot customers

Prior to market launch, Solukon had the software thoroughly tested by several notable pilot customers, including Siemens Energy in Berlin, who has been using the SiDAM, or Pathfinder software, for quite some time as part of a joint development project.

Siemens Energy is a global leader in energy technology. The company works on the energy systems of the future together with its customers and partners, thereby supporting the transition to a more sustainable world. The globally active company has a portfolio that includes both conventional and renewable energy technologies, such as gas and steam turbines, hydrogen-fueled hybrid power plants, generators, and transformers. The AM team in Berlin manufactures hot gas parts in series via 3D printing processes and has been using a Solukon SFM-AT800-S for their depowdering needs for the past two and a half years. "With SPR-Pathfinder®, we can depowder in series without any manual programming. The parts are guaranteed to be clean and this guarantee, in turn, allows us complete freedom in part design. Furthermore, we save a lot of time, which we can then dedicate to other value-adding activities in the manufacturing process," says Julius Schurb, Project Leader for IDEA (Industrialization of Digital Engineering and Additive Manufacturing) at Siemens Energy.

The Siemens Energy use case is also included in the brand-new SPR-Pathfinder® product video that explains the intelligent depowdering process.

Intelligent depowdering process with SPR-Pathfinder®

Intelligent depowdering with SPR-Pathfinder® always follows the same procedure:

1. Upload the file to SPR-Pathfinder®

The user uploads the part's CAD file in .STL format using drag and drop or the file browser.

2. Set the calculation parameters

This includes information on the material and desired waiting times for individual directions of motion.

3. Specify the file storage location

The user can store the depowdering sequence to be calculated either locally or on an external storage device (e.g., USB stick).

4. Start the calculation

The calculation time varies depending on the device's processing power and the complexity of the part.

5. Transfer the cleaning program to the Solukon system

The individual cleaning program can be loaded into the Solukon system via USB stick or OPC UA (optional, upon request).

Software to be presented at Formnext 2022

Solukon will publicly present the software for the first time at Formnext 2022 (November 15-18). Using a transparent heat exchanger, the machine manufacturer will demonstrate how SPR-Pathfinder® software depowders even the most complex geometries in an SFM-AT800-S. The Solukon team looks forward to welcoming visitors at **Booth 12.0, B21**. In addition to the software, all four metal systems will also be on display. We're certain the impressive parts in the depowdering systems will once again attract a great deal of attention. For the first time ever, Solukon will also address the unpacking and depowdering of polymer parts at its booth. Diagrams and videos will explain the design of the SFP770.

"Formnext 2022 will be a real highlight. We look forward to introducing SPR-Pathfinder® to our customers there. The commercialization of the first depowdering software in the world is a milestone for Solukon as well as for the entire AM sector. This is because the software enables true serial cleaning of any geometry without any human programming," Solukon CEO Andreas Hartmann happily shares.

Images:

Image 1: SPR-Pathfinder® calculates the cleaning sequence of a complete build job.

Image 2: The calculations of SPR-Pathfinder® are based on a flow simulation.

Image 3: SPR-Pathfinder® logo



About Solukon

Solukon Maschinenbau GmbH is a German high-quality supplier of powder removal and processing systems for metal and polymer additive manufacturing. Founded in 2015 by Andreas Hartmann and Dominik Schmid, the company, located in Augsburg, has extensive experience in the development of AM systems and related peripheral equipment, and offers a full range of industrial powder processing systems. Since 2022 Solukon offers an intelligent software for automated depowdering of laser-melted metal parts as exclusive licensee, the SPR-Pathfinder®. Solukon products meet the highest functionality and safety standards and are approved for safe and reliable removal of tough-to-handle and reactive materials such as titanium and aluminum.

Solukon is present on four continents. The systems are trusted by leading manufactures of 3d-printing systems, like EOS, SLM Solutions and AMCM, by institutions like NASA and Cern as well as by companies like Siemens and Ariane Group.

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