**Technical Report**

**October 2025**

**Digital Engineering Service from Schmalz: Simplify the Automation of Design Processes**

Less design effort, more efficiency: Schmalz's web-based Digital Engineering Service digitally and automatically designs customized gripping solutions for any number of different sheet metal parts. This saves users up to 80 percent of their design time and helps them achieve their goals with ease.

Design engineers are familiar with the problem, for example with workpieces in a 2D laser cutting application: They have to check for each sheet metal part where the optimal gripping points are, which gripper is suitable, and how to control the suction cups. The new Digital Engineering Service has already proven itself in an exemplary customer analysis. With just 30 sheet metal parts, the design time was reduced from five days to one day. These savings increase with the increasing variety of sheet metal parts.

The tool works as a pure web service, so users do not need to install any software. They simply call up the website, upload their CAD data, and start the analysis. The system supports all common CAD formats such as DXF, STEP, and X\_T. It even automatically converts bent sheet metal parts into 2D data. Those who do not have CAD models can generate the data using a selection mask and individual dimensions.

**Millions of gripping points calculated in seconds**

With quantities of between ten and 20 workpieces, the manual design of grippers quickly becomes confusing. With 100 or more workpieces, no designer can keep track of all the variants and calculate the optimal gripping points. This is where the Digital Engineering Service shows its strength. The technology is based on the finite element method (FEM), a mathematical procedure for structural analysis. The system identifies around one million possible gripping points per component. It checks which configuration achieves the highest coverage and fits optimally to all different workpieces. It then suggests three variants and recommends the best gripping solution.

**From upload to result**

The percentage of workpieces that can be handled with the gripping solution is displayed – it is not always possible to pick up all components with just one solution. For example, if you mainly process 20 x 20 cm sheets but move two-meter-long components twice a day, you need different systems for each task. The new Schmalz solution identifies such cases and shows which sheets the optimized gripper cannot pick up.

The user can see the gripping points that the system has set for each workpiece. The analysis PDF also informs them which coverage is achieved for which component, whether there are any deviations from the standard, and whether individual sheets are critical. A video sequence visualizes the results. With just a few clicks, a reliable design for a solution tailored to the respective workpieces can be created. The result can then be conveniently downloaded or requested directly as a gripping solution. The technical sales department checks whether the solution is suitable for the requested task.

**The Matrix Area Gripper FMG at the heart of the system**

The Matrix Area Gripper FMG is particularly suitable for handling sheet metal parts of different shapes. It is modularly expandable and can be configured in many variants. The Digital Engineering Service selects the appropriate components for the specific application from this modular system. The suction cups can be controlled individually, allowing you to build customized flat grippers with maximum flexibility. And because the suction cups only extend where they are really needed, the system works without misgrips and saves energy. Inactive areas are sealed, and the air-saving control keeps consumption low. Even in the event of a power failure, the workpiece remains securely fixed. The Matrix Area Gripper FMG is particularly impressive in combination with the Digital Engineering Service – together, they unleash their full power in high-mix, low-volume processes in sheet metal processing, such as loading and unloading laser, continuous, and bending machines.

**Areas of application: Special machine construction and system integrators**

Machine builders and system integrators in particular benefit from the new Digital Engineering Service. It allows the right gripper to be designed easily and according to requirements – for a cost- and energy-efficient, sustainable solution. An individually configured system is not oversized, but focuses on the core functions that are actually needed.

If the parts portfolio changes during the machine's life cycle, Schmalz recommends a new analysis. The service then checks whether the existing gripper is still suitable for the new workpieces or whether another system would work more efficiently and thus reduce costs. All calculations are performed on servers in Germany. The terms and conditions regulate the GDPR-compliant handling of CAD data.

**80 percent time savings and €2,500 in cost savings**

In an application with, for example, 30 different components, the service reduces design time by at least 80 percent. Manual design takes around a week, while the automated process completes it in less than a day. Schmalz estimates potential savings of around 2,500 euros for this project, based on standard hourly rates in design.

The system currently works with 2D sheet metal parts in any dimensions. When CAD data is uploaded or dimensions are entered, the transmitted data is automatically checked for suitability. This check primarily relates to the quality of the CAD data and the compatibility of the file format. The tool is growing dynamically, with Schmalz gradually expanding the parameters.

Innovation leader Schmalz offers the service free of charge. This saves customers a lot of design work and the need to search through the product catalog. The solution complements the vacuum specialist's optimization concept: System integrators and machine builders are given a tool with which they can easily perfect their systems themselves – in an energy-efficient and sustainable manner.

(6,107 characters including spaces)

**More information about the product:**

[https://www.schmalz.com/digital-engineering-service](https://www.schmalz.com/de-de/digitale-assistenten/digital-engineering-service)

**Service for editors**

**Meta title:** Gripper design in record time: Digital Engineering Service from Schmalz

**Meta description:** Schmalz automatically designs vacuum grippers with its web-based Digital Engineering Service. Design engineers save up to 80 percent of their time, receive optimal solutions, and work in an energy-efficient and sustainable manner.

**Social media:** Gripping sheet metal parts without a marathon of calculations: Schmalz's new Digital Engineering Service reduces gripper design time by 80 percent. Upload CAD data, start the analysis, use the results – quickly, precisely and free of charge. The service even thinks about the future: If the parts portfolio changes, the analysis can be repeated. Machine builders and system integrators can thus check at any time whether their gripper is still working efficiently – or whether an update is worthwhile.

**Images:**

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|  |  | **Image 1:**  Thanks to the new Digital Engineering Service, a customized gripping solution for different components can be designed automatically and digitally with just a few clicks. |
| Ein Bild, das Gebäude enthält.  KI-generierte Inhalte können fehlerhaft sein. |  | **Image 2:**  Modular design, individually controllable suction cups, maximum flexibility: The Matrix Area Gripper FMG and the Digital Engineering Service complement each other perfectly. |
|  |  | **Image 3:**  The Digital Engineering Service supports designers in quickly and easily designing application-specific gripping solutions. |

Images: J. Schmalz GmbH

**About the company**

Schmalz is one of the market leaders in vacuum automation and ergonomic handling systems. The internationally positioned company's products are used in logistics applications as well as in the automotive industry, the electronics sector and furniture production. The broad spectrum in the vacuum automation business field includes individual components such as suction cups or vacuum generators, complete gripping systems and clamping solutions for holding workpieces, for example on CNC machining centres. In the Handling division, Schmalz offers innovative handling solutions for industry and trade with vacuum lifters and crane systems. With the Energy Storage business area, the company is establishing a further mainstay in the field of stationary energy storage systems.

The combination of comprehensive advice, a strong focus on innovation and first-class quality ensures sustainable added value for customers. Intelligent solutions from Schmalz make production and logistics processes more flexible and efficient - and at the same time fit for advancing digitalisation.

Schmalz is represented in all major markets with its own locations and trading partners in around 70 countries. The family-owned company, headquartered in Glatten in the Black Forest, employs around 1,800 people at 31 locations worldwide.

#### Contact for Questions

J. Schmalz GmbH

Corporate Communications

Johannes-Schmalz-Str. 1

72293 Glatten, Germany

T: +49 7443 2403-506

[presse@schmalz.de](mailto:presse@schmalz.de)

[www.schmalz.com](http://www.schmalz.com/)

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