



CASE STUDY

ADDITIVE MANUFACTURING'S BIG IMPACT ON A SMALL TOOL

A CASE STUDY ON HOW ADDITIVE
MANUFACTURING IMPROVES THE PERFORMANCE,
DURABILITY, AND QUALITY OF MODULAR
GROOVING TOOLS.



Burgmaier is a leading manufacturer of precision parts in large series. Around 350,000 parts leave the factory every day and statistically there are five Burgmaier parts in every European car. Burgmaier combines its expertise in subtractive manufacturing with the unique advantages of Nikon SLM technology: filigree and bionic geometries are created in the shortest possible time; lightweight structures, close to contour channels and the integration of new functions enable real added value for the products.

With the unique combination of milling and turning and the Nikon SLM technology, the company also opens up new business models in the tooling industry. Application examples include an additively manufactured blow-out tunnel.

THE PROCESS OF A BLOW-OUT TUNNEL

The additively manufactured blow-out tunnel is used to clean components in an automated production process: After machining, chips and oil must be removed from the component before a measuring process is carried out in the next step. In the conventional design, chips on the component repeatedly lead to machine downtimes during measuring processes. Conventional air outlets cannot ensure cleanliness. On average, five machine downtimes per shift are the result. Manual intervention is necessary and overall costs increase. A total of five percent of the production volume per shift is affected.



FUTURE-ORIENTED SOLUTIONS WITH **NIKON SLM® TECHNOLOGY**

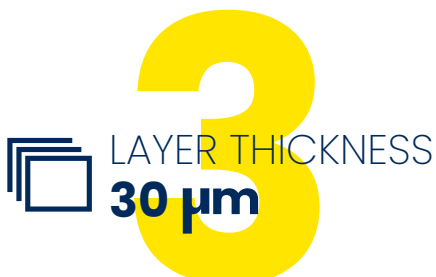
In order to improve quality and the entire manufacturing process, it is necessary to revise the component design so that the compressed air reaches the component from all sides. Burgmaier takes advantage of the Nikon SLM® technology and first integrates round air ducts, different duct cross sections and different outlet angles of the ducts.

Burgmaier's team directly produced six different variants in one build job using the SLM® 280 from Nikon SLM Solutions. This method greatly simplifies subsequent testing. The blowout tunnel is built lightweight in AlSi10Mg with a layer thickness of 30 µm.

With the help of Nikon SLM Technology, Burgmaier not only redesigned the component. After installation, machine downtimes due to chips were reduced to zero, while at the same time the degree of utilization increased by seven percent. Another positive aspect is that the noise level of the blow-out device is significantly lower than before. In addition, not only chips but also oil is removed. All in all, Burgmaier thus saves a high five-figure sum per year.

“ For us, metal-based additive manufacturing is an optimal complement to our dozens of milling and turning machines. With the Nikon SLM® technology, we also enter new customer groups outside the automotive industry, for example manufacturers of cutting tools. ”

– Ken Krauß, Head of Additive Manufacturing at Burgmaier



SELECTIVE LASER MELTING

Additive manufacturing encompasses a variety of processes to build, however, they are all based on the same principle of adding material to create opposed to traditional methods that subtract material. Specifically, in selective laser melting a layer of metal powder is spread onto a substrate plate. Then lasers selectively melt powder to create the first layer of the build. A fresh layer of metal powder is evenly distributed over the build surface and the lasers melt each successive layer to the layers underneath until the desired component is produced. Unlike laser sintering, selective laser melting completely melts each layer into the previous for completely dense metal parts. Compared to traditional manufacturing methods, additive manufacturing enables parts with complex geometric shapes and hollow structures to be produced.

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The SLM®280 is technically leading and reliable. We can work constructively and solution-oriented.

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– **Ken Krauß**, Head of Additive Manufacturing at Burgmaier



BURGMAIER



has been committed to the development and manufacture of precision parts in large series at the highest quality level since its foundation in 1931. Through its innovative strength, Burgmaier has developed into one of the leading manufacturers of precision parts and supplies customers worldwide. Around 700 employees in development, design, production, assembly and quality assurance, on 250 production machines, on 31,000 m² of production space strive together to live up to the credo Quality First.

The passion for zero defects is the guarantee that Burgmaier can inspire its customers. Burgmaier reacts flexibly to changes in the market in order to ensure the company's long-term success and to be able to offer customers innovative solutions and employees attractive jobs. The world is currently in the midst of the greatest change in the history of the automobile. Burgmaier will continue to play a key role as a manufacturer of high-precision parts in the future automotive and networked world. Especially in the areas of electric power steering, hybridization, camshaft phasing, transmissions, brakes and electric motors, Burgmaier sees billion-dollar markets for its products for decades to come.

Around 350,000 parts leave our plants every day and statistically there are five Burgmaier parts in every European car.

Burgmaier is not only a specialist in machining a wide range of materials and alloys. Burgmaier combines this expertise in subtractive manufacturing with the advantages of additive manufacturing: Filigree and bionic geometries are created in the shortest possible time. Lightweight structures, near-contour channels and the integration of new functions enable added value for your products.

Burgmaier accompanies you along the entire process chain of additive manufacturing: from the design and engineering of the products to additive manufacturing and precision CNC machining. Standardized quality assurance with test certificates is a matter of course for Burgmaier.

NIKON SLM SOLUTIONS



is an integrated solutions provider and metal additive manufacturing partner. The company takes a vested interest in customer's long-term success with metal additive manufacturing. Robust Selective Laser Melting machines optimize fast, reliable and cost-efficient part production and Nikon SLM Solutions' experts work with customers at each stage of the process to provide support which elevates use of the technology and ensures their return investment is maximized. A publicly traded company, Nikon SLM Solutions AG is headquartered in Germany, with offices in Canada, China, France, India, Italy, Singapore and the United States.

Further information is available on
[**www.nikon-slm-solutions.com**](http://www.nikon-slm-solutions.com)