

CASE STUDY

NIKON SLM SOLUTIONS

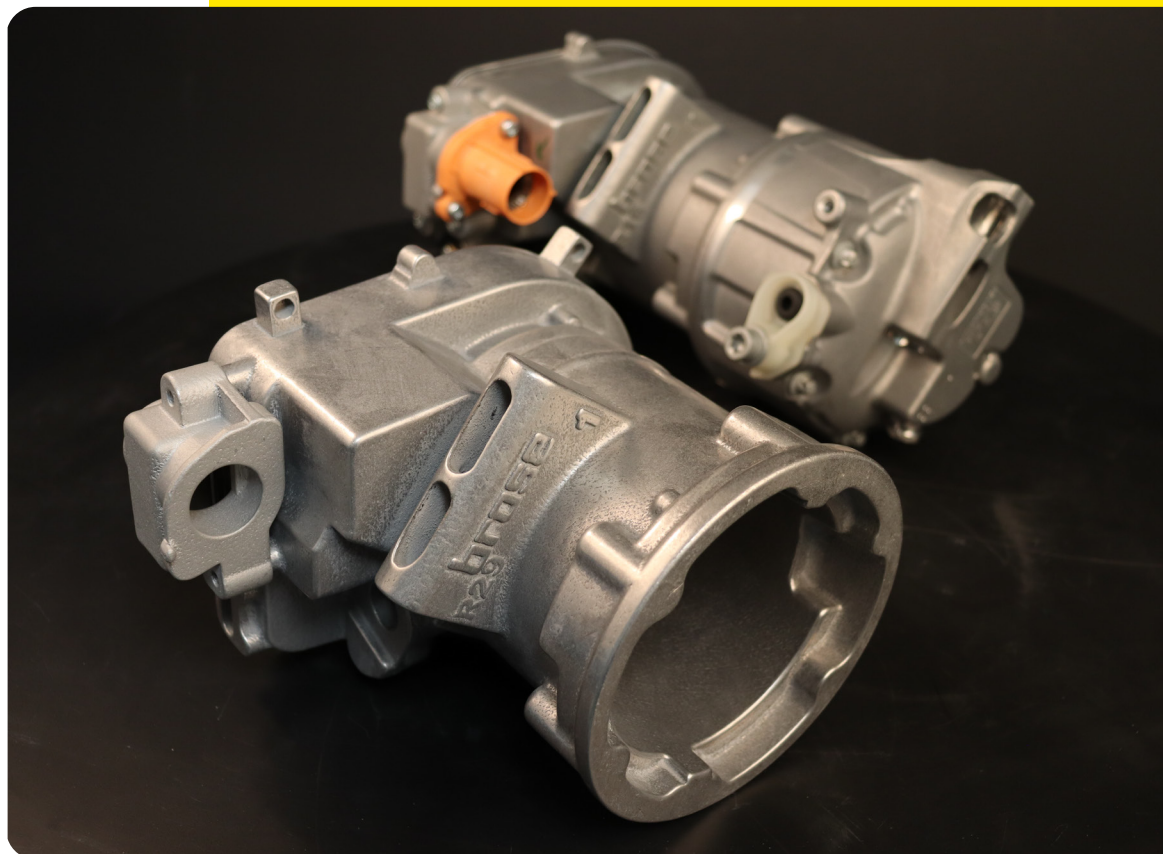
REVOLUTIONIZING AUTOMOTIVE PROTOTYPING –
SUBSTITUTE SAND CAST WITH AM PARTS
IN DEVELOPMENT PHASE A AND B

BROSE SE :

PIONEERING AUTOMOTIVE INNOVATION WITH NIKON SLM SOLUTIONS

Brose, a pillar of automotive innovation, is renowned as one of the five largest family-owned automotive supplier. Their century-long legacy is reflected in every third new car worldwide, supported by a robust workforce spread across 69 locations in 24 nations. Brose's commitment to innovation is evidenced by their substantial patent applications, securing them a spot among Germany's leaders in progress. Their focus on enhancing vehicle access, interior comfort, and thermal efficiency heralds new functionalities for vehicles of all types, fostering a future where automotive solutions are efficient, flexible, and environmentally considerate.

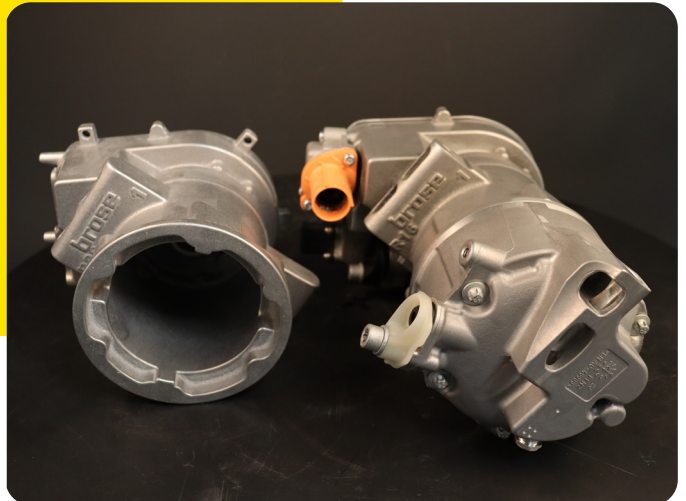
Recognizing the transformative potential of Additive Manufacturing (AM), Brose has adeptly adapted Laser Beam Melting technology over the past half decade. This progression has produced over 400,000 different parts and set Brose on a path to significantly expand production capabilities.



PROJECT SPOTLIGHT :

CLIMATE COMPRESSOR HOUSINGS – A LEAP TOWARDS ENVIRONMENTAL EXCELLENCE

Traditionally, the journey from concept to product in automotive development is fraught with obstacles, such as the necessity for physical prototypes to validate various development phases (A, B, C, D, E, etc.). Brose undertook the initiative to fabricate A and B sample components for climate compressor housings using their proprietary metal alloy via Additive Manufacturing (AM). These components are essential for conducting rigorous corrosion tests on electric climate compressors, a critical factor in meeting the industry's stringent environmental regulations. The project aimed to replicate the mechanical property influences of traditional die-casting within 3D-printed parts. Brose's in-house development of powder alloys and parameters enabled them to create 3D-printed parts that match the material properties of cast parts, thereby ensuring functional and meaningful validation tests.



REDEFINING AUTOMOTIVE DEVELOPMENT PHASES

Historically, the automotive industry has insisted on using cast parts throughout all development phases, with sand casting employed in early stages and high-pressure die casting for series production. The recognition of AM parts' comparable material properties and behavior by industry frontrunners like Brose has transformed this approach. Now, AM parts are being accepted as substitutes for sand-casted parts, signifying a monumental shift that streamlines the development process and slashes costs, while increasing sustainability and repeatability.

NIKON SLM SOLUTIONS: PIONEERING ACCELERATED DEVELOPMENT THROUGH ADDITIVE MANUFACTURING

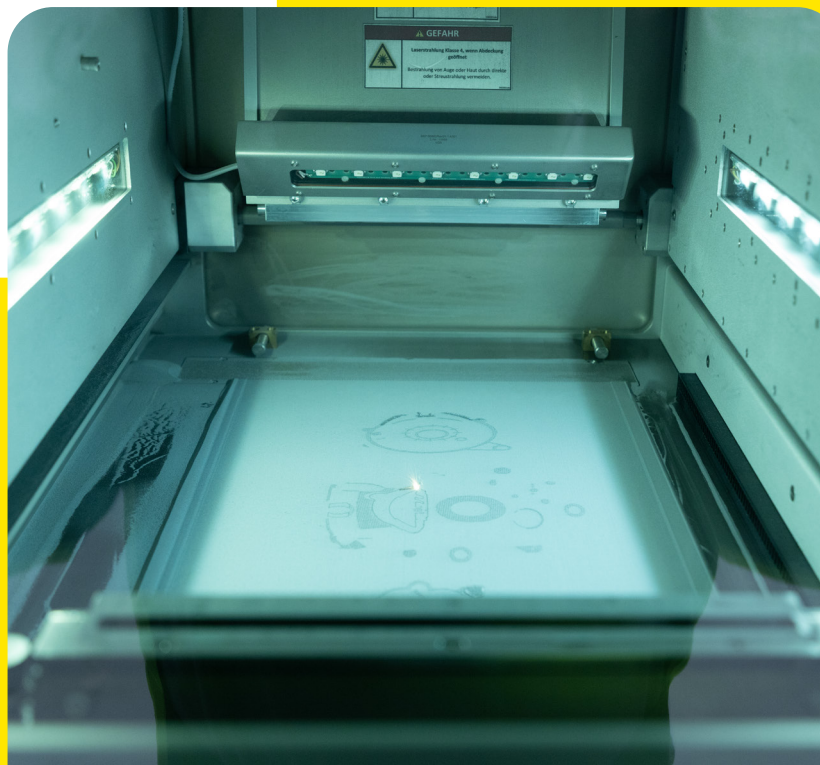
Brose's strategic deployment of the SLM®500 machine, coupled with intensive parameter optimization studies, yielded impressive outcomes:



SLM®500

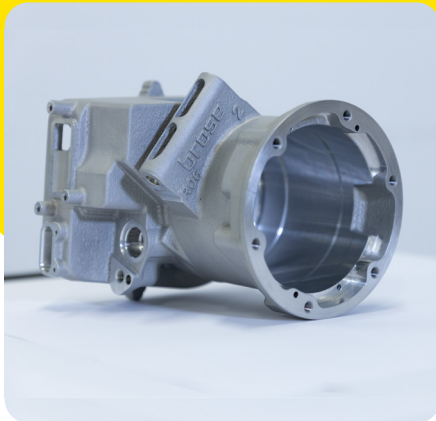
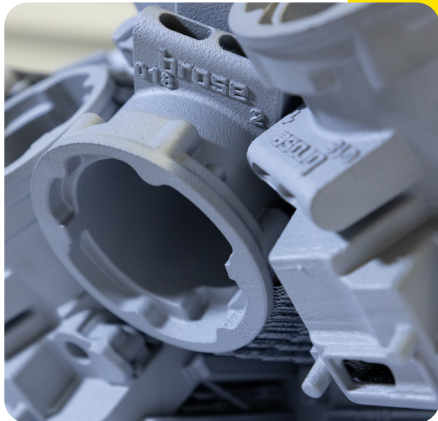
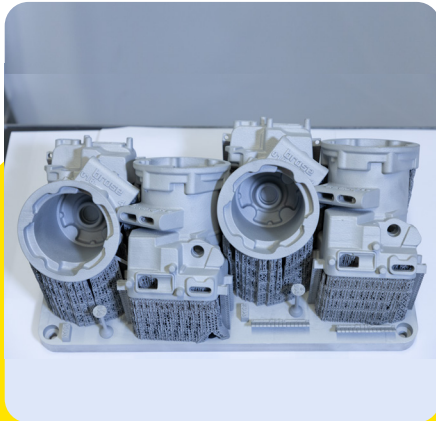
MACHINE	: SLM®500
BUILD ENVELOPE	: 500 x 280 x 365mm ³
LASER POWER	: 4x700W

- 1** Lead times were cut drastically from more than 20 weeks to less than two, significantly accelerating the production of validation parts.
- 2** Cost savings of approximately 80% were realized in comparison to conventional tooling.
- 3** Brose gained the ability to self-engineer materials and parameters that replicated the quality of parts produced via serial manufacturing processes.



FORGING FORWARD WITH NIKON SLM SOLUTIONS

The partnership between Brose and Nikon SLM Solutions has been founded on a mutual commitment to technological excellence and customer-centric innovation. Brose's selection of the Nikon SLM Solutions fleet— a lineup renowned for fulfilling the rigorous demands of the automotive sector— enabled a synergistic alliance. This collaboration facilitated not just technical advancements but also fine-tuning of machine processes, ensuring technical specifications were met with precision and repeatability.



“ Partnering with Nikon SLM Solutions has been a transformative experience for Brose. Their advanced SLM® technology and unwavering support have enabled us to drastically reduce development lead times and costs while maintaining the high standards of quality and performance expected in the automotive industry. This collaboration has not only accelerated our innovation capabilities but also strengthened our commitment to delivering safer and more efficient solutions for our customers worldwide.” ”

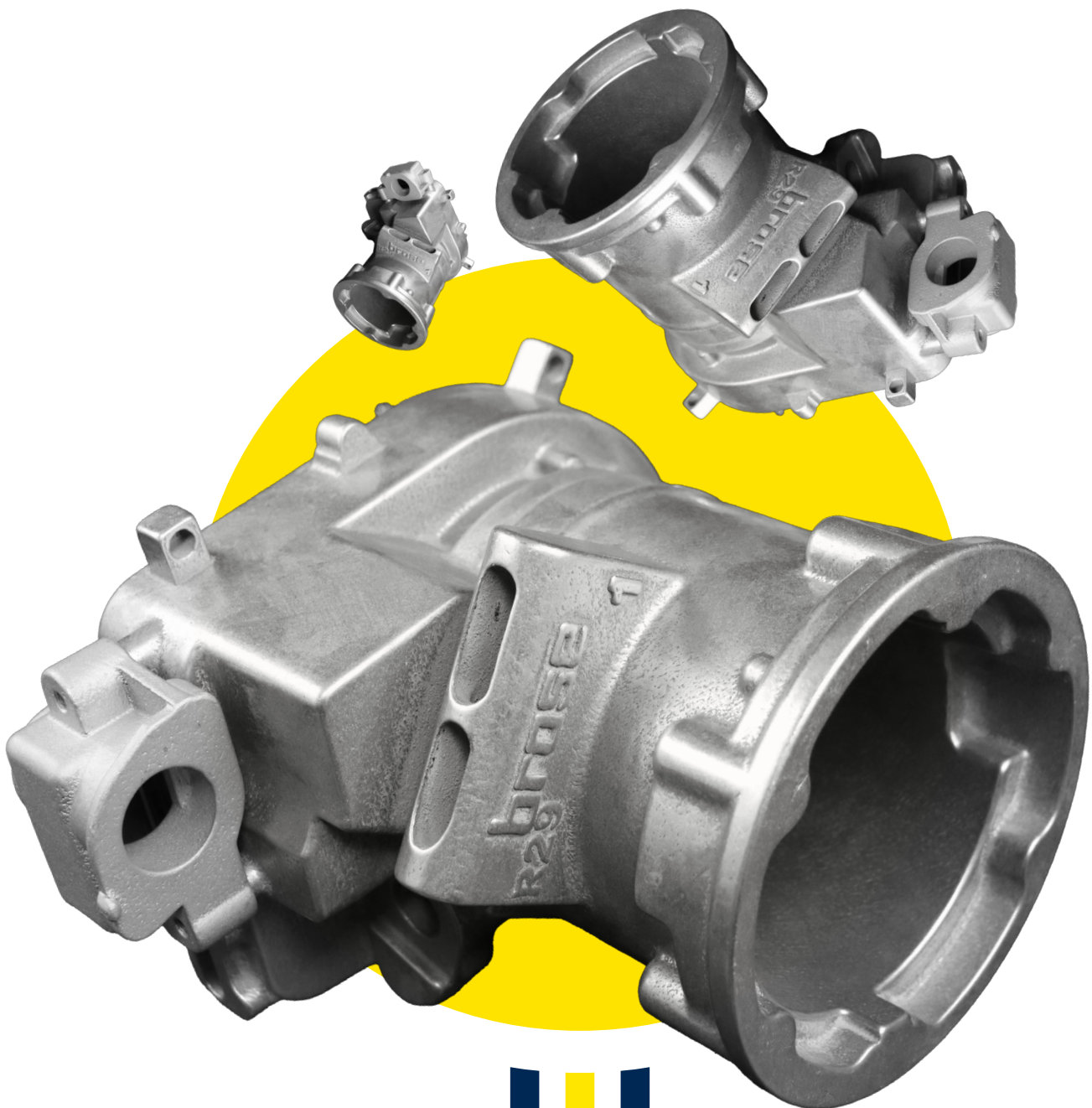
Commented by Eric Fritzsche,
Director Additive Technology at Brose Group.



A TRAILBLAZING COLLABORATION

This case study is a testament to the shared vision and concerted efforts of Nikon SLM Solutions and Brose. Together, they are redefining the automotive manufacturing landscape, setting new industry standards for innovation, agility, and sustainability. By leveraging advanced metal AM solutions, they are not just meeting the current industry demands but also paving the way for a more adaptable and eco-conscious automotive future.

For a deeper dive into Brose's innovative journey with Nikon SLM Solutions in the automotive sector, please visit www.nikon-slm-solutions.com.





NIKON SLM SOLUTIONS

Nikon SLM Solutions helped invent the laser powder bed fusion process, was the first to offer multi-laser systems and all selective laser melting machines offer patented quality, safety and productivity features. Taking a vested interest in customers' long-term success in metal additive manufacturing, Nikon SLM Solutions' experts work with customers at each stage of the process to provide support and knowledge-sharing that elevate use of the technology and ensure customers' return on investment is maximized. Optimal paired with Nikon SLM Solutions' software, powder and quality assurance products, the Nikon SLM® technology opens new geometric freedoms that can enable lightweight construction, integrate internal cooling channels or decrease time to market.

Nikon SLM Solutions AG focuses exclusively on metal additive manufacturing and is headquartered in Germany with offices in China, France, India, Italy, Singapore, and the United States and a network of global sales partners.

Further information is available on
www.nikon-slm-solutions.com

