

Saxony-Anhalt as a Competence Centre for Aluminium: Light Ideas for the Automobility of the Future

Innovative Alliances Tinkering on Light Constructional Components in Aluminium Die Casting

Numerous companies in Saxony-Anhalt are developing innovative components made from aluminium and thus ensuring lighter vehicle construction. Solutions that are fit for the future are being created, for example, in the framework of the competency cluster for aluminium. Vehicle manufacturers around the world are choosing innovative, light components from Saxony-Anhalt for the sustainable resource-saving mobility of tomorrow.

MAHREG Automotive – Creating a Technological Lead for Aluminium Casting and Lightweight Construction

For 18 years now, the Cluster MAHREG Automotive, an initiative of Saxony-Anhalt Automotive e.V., has been developing regionally and nationally into an innovative alliance between science and business. 65 members and more than 170 partners work hand in hand on innovations for the automobile of the future.

MAHREG is the technological leader for the Research and Development Department of the aluminium competence cluster in the Automotive Cluster East Germany (ACOD). Essential tasks include the development of innovative cast products as well as process optimisation, in order to ensure profitability and competitiveness, and to establish environmentally-friendly processes. The intensive cooperation between research institutions, automobile suppliers, toolmakers and special engineers delivers a technological lead: made in Saxony-Anhalt. The cluster wants to be available as a full-service partner to customers around the world. Research, development, and realisation of the prototype up to series maturity are covered by the competence network.

Traditional Site in the Middle of Europe

The casting industry in Saxony-Anhalt and especially in the Harz has been successful for more than 100 years. The available know-how is incorporated into visionary product and process development. Trimet, Germany's biggest manufacturer of aluminium, also appreciates the importance of this traditional location. In 2001, Trimet took over the aluminium foundry founded in 1870 and the recycling plant set up in 1995 in Harzgerode. The full recycling of aluminium is unique in Germany. Scraps are melted down in the recycling plant and the alloy is processed, directly in the neighbouring foundry, into die-cast components for chassis, engines, gearboxes, structural components, and bodies. "This way we can achieve increased added value and protect the environment", emphasises Erich Jürgens, Director and Head of Metal Management at TRIMET Automotive Holding GmbH. "Process optimisation is important for the quality of the products and for competitiveness."

A key competence of Trimet Aluminium SE is the development and production of special alloys. The requirement profiles such as strength, hardness, and ductility are determined by the wishes of the customers. The alloys are developed on the basis of thermodynamic calculations and experimental testing. Automobiles are an important field of application because lighter vehicle components are indispensable for meeting future CO2 targets. The most energy-efficient and resource-saving production possible is optimally realised in Harzgerode due to the short distances travelled between melting and casting. Jürgens is convinced that "Aluminium lightweight construction is the guarantee that the social demand for adherence to limit values for the reduction of global pollution will also actually be met." "Aluminium is the material of the present and future." Globalisation and the desire for contacts in the core markets led to a joint venture with the Chinese parts manufacturer Bohai Automotive in summer 2018. Bohai Automotive has a 75 percent share in TRIMET Automotive Holding GmbH, and Trimet Aluminium SE has a 25 percent share. This cooperation will further strengthen the site in Harzgerode, which is already one of the big five aluminium die-casting foundries in Germany, with around 630 employees.

Another clear advantage of the site in Saxony-Anhalt is the proximity to the original equipment manufacturers (OEMs), such as VW, Daimler, BMW and Porsche. The good infrastructure, available industrial sites, and uncomplicated support from the state and municipalities are decisive for the settlement of world market leaders in Saxony-Anhalt. For example, KSM Castings, the world's biggest manufacturer of vehicle parts in the CPC process was already investing in its site in Wernigerode in 2001. The strategically favourable location between the headquarters in Hildesheim and the Volkswagen plants and the available know-how at the traditional foundry site were good reasons for this decision. "Wernigerode is our newest plant in Europe", emphasises Dr. Marc Menge, Plant Manager of KSM Castings Group at the Wernigerode site. "With currently 440 employees and a turnover of 96 million euros, the choice of location has proved to be exactly right."

KSM Castings produces, among other things, crash-relevant chassis parts, such as wheel carriers, swivel bearings, and front axle subframes/components, which have to possess high strength. Dynamic performance for endurance strength and crash is becoming increasingly important. Using in-house developed production processes, such as the Counter Pressure Casting (CPC) and the constant further development of existing processes and alloys, sturdy and safe components are created that save up to 30 percent in weight. The latest development tools are used for the component design. Component testing is also an important field, for the safeguarding of product liability, and the expansion of added value and know-how. "Another exciting field for us is e-mobility", says Menge. "Our group's development department has already been busying itself for a long time with new components that will in future find their way into e-vehicles."

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