Press Information

Megacasting - The New Process

One Hundred Individual Parts in a Single Cast

Megacasting refers to the production of particularly large metal components made of aluminum using the die-casting process, which requires specialized techniques and machines. This process is increasingly being used in automotive manufacturing, where traditional sheet metal welded assemblies have dominated vehicle body construction for over a century. Traditional die casting has been used for many years in the production of housings for the powertrain sector, such as crankcases, transmission housings, oil pans, and chassis components. With the rise of electromobility, additional components such as battery frames, motor housings, and complete battery enclosures up to a single-piece rear vehicle structure have been added.

Megacasting employs special alloys that provide high material properties in their naturally hardened state. This eliminates the need for complex heat treatments and prevents component distortions. The process is supported by an air extraction system within the mold, enabling near-vacuum mold filling. Due to its novelty, megacasting holds significant potential, challenging many established processes and optimizing numerous applications.

The automotive supplier Handtmann has chosen a Bühler AG Carat 610 extended die-casting machine for its entry into megacasting. This machine has a clamping force of 61,000 kN and a shot weight of up to 128 kg of aluminum, enabling the production of large structural components. For outsiders, this manufacturing process appears like body construction in a single casting: complex modules, which previously consisted of up to 100 individual parts, can now be produced in a single

die-casting shot, resulting in an overwhelming level of functional integration.

The advantages of large-format die-cast components include reduced manufacturing complexity, lower procurement and logistics costs, the elimination of multiple production steps, and shortened tolerance chains. Labor-intensive joining and finishing processes such as welding and gluing are largely avoided. Additionally, megacasting offers potential weight reductions, which is particularly important for electric vehicles. Another advantage is the improved recyclability of vehicles, making megacasting a crucial part of the circular economy.

Handtmann has started manufacturing components for the battery sector, where stiffness plays a central role. However, die casting is also used in the rear and front areas of vehicles, such as rear structures that have conventionally been made from sheet steel. Structural casting does not necessarily have to involve large components but also allows for intelligent combinations of different components.

Logistics processes also benefit from die-casting technology, as reducing the number of individual parts increases efficiency. There is also growing interest among commercial vehicle manufacturers in using aluminum die casting for producing particularly large high-voltage battery enclosures for electric trucks.

Internationally, megacasting is already in high demand, particularly in China and the USA. In Europe, Handtmann is currently the only supplier producing such large-scale cast parts in series. This advanced die-casting technology has the potential to sustainably transform automotive production. For the Handtmann Group, this means long-term growth, innovation, and increased competitiveness in Germany and Europe.

***