

Leading LIGHT

DEMAND-LED INNOVATION SHAPES LIGHTWEIGHT METAL TECHNOLOGY

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Market forces

Today an ever growing range of industries are looking for higher performance materials that can minimise their costs, energy consumption and overall environmental footprint. As a result, lightweight metals, such as aluminium, magnesium and titanium, are increasingly being considered as alternatives to steel. Thanks to new research into alloys and surface technologies, engineers and designers can now use these metals in ways that would previously have been impossible.

The metal castings market is projected to be worth nearly USD 40 billion by 2025. The recent trend of vehicle lightweighting and the rise of the electromobility sector means the focus of this market will shift increasingly toward lightweight castings.

"The lightweight metals market includes ferrous and non-ferrous materials and is continuing to increase in tonnage per year driven primarily by the automotive industry," says Gregory Peterson, Principal Materials Engineer at the Michigan Manufacturing Technology Center (MMTC). "Advanced high strength steels, aluminium and magnesium are replacing traditional lower strength steels, while non-automotive industries, including sustainable energy, agriculture and military, are also considering lighter weight materials."



Porsche will take its first step into the electric vehicle market in 2019 with the release of its highly-anticipated Taycan, based on the carmaker's Mission E concept.

Charging ahead

The electric vehicle (EV) market is currently booming. According to the recently released Global Electric Vehicle Market Outlook 2018 report from US-based business consulting firm Frost & Sullivan, global sales are poised to surge from 1.2 million in 2017 to 1.6 million in 2018, and further upward to an estimated 2 million in 2019. Business intelligence company CRU Group expects EVs to account for around 30% of the global vehicle fleet by 2030.

The burgeoning electromobility market will lead to a considerable increase in the use of light metal castings. The integration of lightweight components into automotive design can mean both longer ranges and more reasonably priced EV batteries.

The lightweighting trend associated with electromobility

means lightweight cast components made from non-ferrous metal – aluminium and, to a lesser extent, magnesium – are becoming increasingly important as rivals to steel and aluminium sheet. Components for chassis and body parts, such as struts and longitudinal bars, are increasingly being made from diecast aluminium too.

With the automotive market moving toward more complex components with increased functionality, lower weight and lower cost, the lightweighting trend presents both a challenge and an opportunity for foundries across the globe. The growing demand for efficiency and sustainability means die casters are encountering new challenges, not least of which is to master the die casting process and ensure cast components meet the required level of quality. ▶

