

Metal AM in the automotive industry: New vehicle structures, series components for the luxury market and beyond

The automotive industry has successfully embraced metal Additive Manufacturing as a prototyping technology for a number of years. As the technology advances, however, the possibilities for the use of metal AM for series component production are now starting to be explored. In the following review the challenges and opportunities for metal AM in the automotive industry are presented, including a radical concept to use AM parts as key structural elements in the next generation of automotive spaceframes.

Automotive manufacturers are increasingly required to integrate a diverse range of drive types and energy storage systems into vehicle structures. The vehicle bodies of tomorrow will not only need to be lighter but will also require designs that are flexible enough in order to accommodate the large number of alternative drive systems, some of which may be produced in relatively low volumes. The consequence is an increasing number of vehicle derivatives which demand adaptable bodywork concepts that are economical to manufacture. In the foreseeable future, Additive Manufacturing could offer entirely new approaches.

One such approach is the EDAG Light Cocoon concept car, unveiled in March 2015 at the Geneva Motor Show and seen later that year at the International Motor Show (IAA) in Frankfurt (Fig. 1). The EDAG Light Cocoon concept is a compact sports car with a bionically designed and additively manufactured vehicle

structure, covered with an outer skin made from weatherproof textile material. The intention with this vehicle was to trigger a debate among designers and break with conventional expectations of vehicle

design and construction. The car's creators state that the vehicle highlights sustainable production and at the same time embodies the technological potential of Additive Manufacturing.

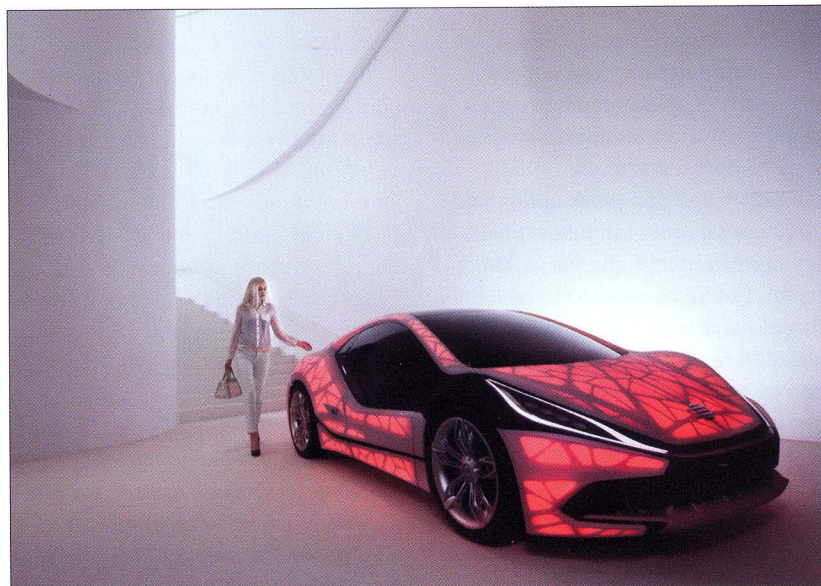


Fig. 1 The "EDAG Light Cocoon" concept car features a bionically optimised and additively manufactured vehicle structure

