

Opportunities and obstacles for additive manufacturing

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Additive manufacturing is attracting increasing attention. To produce parts by successively adding layer upon layer of material instead of by subtractive or molding techniques not only opens new opportunities for design but also provides time and cost benefits. But a rash of technical and structural problems limits the likelihood that the new manufacturing technology is going to become a serious competitor to conventional material processing in the short term. However, some interesting exceptions exist.

At first sight, the advantages of additive manufacturing seem to be compelling: less demand for material, fast implementation of changes in design, simple production of complex geometries up to lightweight structures, combination of different materials or colors in a single step, and so on. Thus, engineers and people in charge of production processes gain access to a variety of new possibilities for manufacturing parts faster, more individually and ideally also more cost efficiently.

Still, today the use of additive manufacturing is limited to the production of prototypes and, in very rare cases, small batches too. The main reasons for this are the limited range of available materials and the often horrendous prices these materials command.

Plastics such as PA 12, ABS and photopolymers are frequently used for additive manufacturing. They normally have to be specifically refined for the subsequent additive manufacturing process. Furthermore, formulations also exist for ceramics and metals in powder form. This limited assortment of materials places serious constraints on additive manufacturing as a production technology for the manufacturing of many products.

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The preparation of raw materials for use in additive manufacturing processes is normally done by a few technology specialists who also develop the appropriate machinery and software. These companies commit their customers to purchasing in particular the plastic materials exclusively from them. Thus, the prices are many times higher - up to tenfold and more - than the conventional price.

As long as supply and market structures in the field of additive manufacturing technologies stay as they are, managers will have to carefully assess individual opportunities for their company. Here technical market research can deliver crucial input regarding cost analysis, sourcing strategy and process assessment.

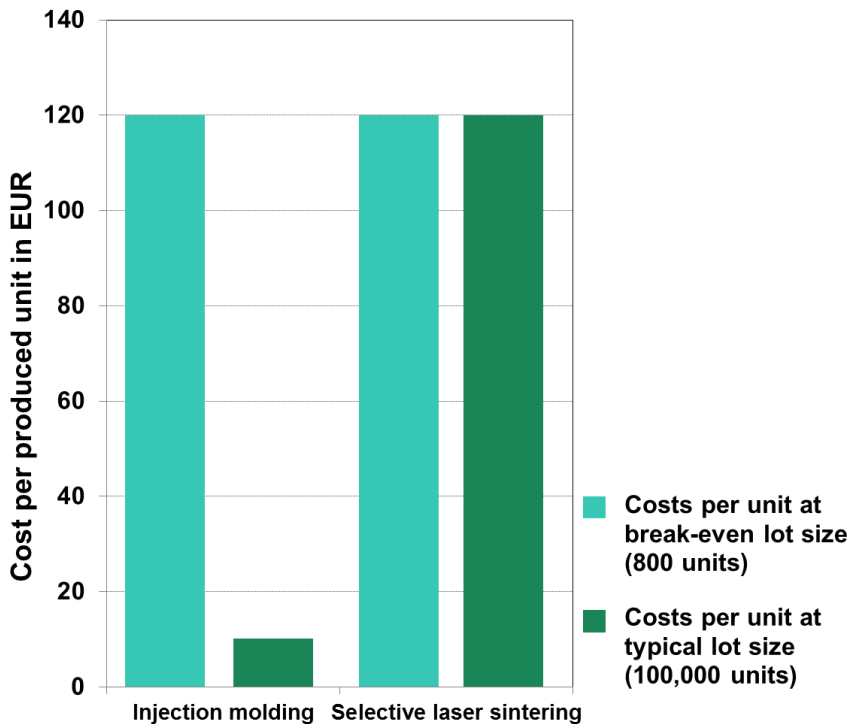


Diagram: Production cost of PP headlight housings: conventional vs. additive manufacturing

Schlegel and Partners monitors the important players along the value added chain in the market for additive manufacturing and gains insights into possible applications for this technology in several industries and for selected products. Furthermore, cost comparisons between conventional and additive manufacturing show under which conditions the new technology becomes economically attractive.

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