

The Free Beginner's Guide

06 : GLOBAL
EFFECTS

08 :
APPLICATIONS

3D Printing Benefits & Value :

3D printing, whether at an industrial, local or personal level, brings a host of benefits that traditional methods of manufacture (or prototyping) simply cannot.

Customisation

3D printing processes allow for mass customisation – the ability to personalize products according to individual needs and requirements. Even within the same build chamber, the nature of 3D printing means that numerous products can be manufactured at the same time according to the end-users requirements at no additional process cost.

Complexity

The advent of 3D printing has seen a proliferation of products (designed in digital environments), which involve levels of complexity that simply could not be produced physically in any other way. While this advantage has been taken up by designers and artists to impressive visual effect, it has also made a significant impact on industrial applications, whereby applications are being developed to materialize complex components that are proving to be both lighter and stronger than their predecessors. Notable uses are emerging in the aerospace sector where these issues are of primary importance.

Tool-less

For industrial manufacturing, one of the most cost-, time- and labour-intensive stages of the product development process is the production of the tools. For low to medium volume applications, industrial 3D printing – or additive

manufacturing – can eliminate the need for tool production and, therefore, the costs, lead times and labour associated with it. This is an extremely attractive proposition, that an increasing number of manufacturers are taking advantage of. Furthermore, because of the complexity advantages stated above, products and components can be designed specifically to avoid assembly requirements with intricate geometry and complex features further eliminating the labour and costs associated with assembly processes.

Sustainable / Environmentally Friendly

3D printing is also emerging as an energy-efficient technology that can provide environmental efficiencies in terms of both the manufacturing process itself, utilising up to 90% of standard materials, and, therefore, creating less waste, but also throughout an additively manufactured product's operating life, by way of lighter and stronger design that imposes a reduced carbon footprint compared with traditionally manufactured products.

Furthermore, 3D printing is showing great promise in terms of fulfilling a local manufacturing model, whereby products are produced on demand in the place where they are needed – eliminating huge inventories and unsustainable logistics for shipping high volumes of products around the world.