

In the future everything could be produced in the kitchen at home

BY JACOB BENTHIEN

RAPID MANUFACTURING: The development of 3D CAD programmes and 3D printers is progressing rapidly these days. Rapid Manufacturing makes even the impossible possible, and for lots of products new thinking will be required before production is started

The day when physical manufacturing of items or components is carried out by consumers themselves is just round the corner. Rapid Manufacturing (RM) is progressing rapidly and the development of the technology is advancing at a similar speed to mobile phones and computers.

"In the long term, RM will change our entire conception of production," says product manager Olivier Jay at the Danish Technological Institute in Århus. "A vast number of products will cease to be produced to stock. A buyer will instead get a 3D file of the product via the internet, and then go in and change either the design or construction with a CAD programme, and then physically produce the goods in a 3D printer, or print out the item as it is."

PLASTIC OR METAL

The technology behind RM is the result of materials research in recent decades, supple-

mented by plenty of innovative thinking and exploitation of lasers, welding and computer technology. In simple terms, the technology involves creating a design in 3D CAD and then running the construction through a printer, which then builds the construction. The printer can use a several-component fluid plastic material that hardens when exposed to laser light. Or the material can be a metal powder alloy which is welded or sintered. The whole construction of the item is made in one piece, which means that items which conventionally cannot be produced at all – or at best need to be produced in several small parts and then assembled – can now be fabricated as finished items.

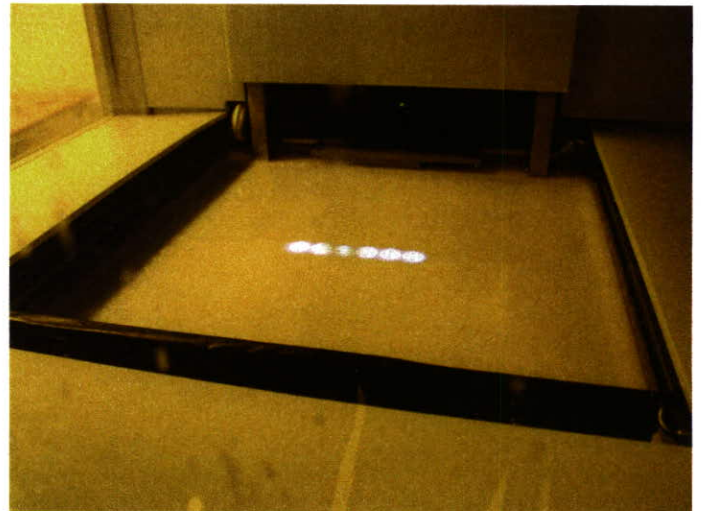
"One thing is the technology itself, which is still at a preliminary stage but advancing with great strides," says Olivier Jay. "Another thing is the philosophy regarding our way of thinking of production. In a few years, when I want to give my mother a lamp as a present, I won't need to go through the slow process of shopping around for it, packing it and sending it. Via the net, I will send her a CAD programme which she takes to the local print shop. Two hours later she can collect her ready-made present."

DANISH HEARING INSTRUMENTS IN THE LEAD

The technology is already being used on a large scale by many forward-looking industrial

companies. This is especially the case in the medico and rehabilitation industry where stocks are small and individual adjustment is necessary. Almost all manufacturers of hearing instruments are using RM. All ears have their very own personal shape, and when the mould has been made, the data is digitalised and the earpiece is printed out. The file is stored and can be endlessly re-used. Given that around half of all hearing instruments in the world are manufactured by three Danish companies, Denmark is one of the countries where RM has seen a major breakthrough.

"There are already countless examples of RM," says Olivier Jay. "The aviation industry and specialist auto industry are making much use of RM. The production time is often less than half the normal time, and provided batches are relatively small, production is significantly cheaper. Naturally there is a point of intersection where conventional production becomes both faster and cheaper, but this point is moving on almost a daily basis due to the rapid development in the area. A printer which today perhaps costs EUR 150,000 will in just in a few years be purchasable for EUR 15,000. Production time will become ever faster, and surface treatments increasingly sophisticated."



REVOLUTION IN THE DESIGN INDUSTRY

The design industry is seeing a real revolution these days thanks to Rapid Manufacturing (RM). Everything that can be designed in a 3D computer programme can be produced, and that creates opportunities for designing far more complex and advanced products, and for creating prototypes both faster and cheaper.

At the Danish Technological Institute in Århus, product manager Olivier Jay estimates that the price of design products created via RM are already competitive. The institute has produced and supplied a stock of 300 exclusive sunglasses to an Italian designer. The number was deliberately set low to maintain the exclusiveness. If they had been produced in a conventional way, the price per pair would have been twice the RM price, and delivery time close to twice as long. Only with a stock of 1,000 pairs of sunglasses, would it have been cheaper, but not faster, to supply.

"The production form also forces the designer to think of the functionality of products in a new way," says Jay. "With RM new opportunities arise for thinking substance into the products, where conventional production concentrates more on expression. Once RM really gains a breakthrough, the designer will have a new and more central role in the production process. Simply because everything will be possible."

