

While the small robots print 0.1-0.3 mm layer thickness, the large 3D printers print at layer thicknesses of 1-2 mm.

3D printing on a very large scale

MDT A/S is one of only a handful of companies in the world to print 3D elements of 3 x 2 x 1.5 metres. The company has invested in development and machinery, and can print in three sizes.

People at MDT Flexible Products in Kolding, Denmark do not flaunt their accomplishments. They flaunt neither their premises, which have an ultramodest company sign, nor their products that include many lightweight aluminium or composite designs produced for TV studios, the Eurovision Song Contest, the Royal Theatre in Copenhagen or 92 Marks & Spencer stores in the UK. Nor with several thousand square metres of noiseattenuating material, often with image print. They have never bragged about any of these.

The same applies to their 3D print competences. However, now that they can print on a very large scale, they are willing to spill the beans to the offshore industry.

"We have invested fairly heavily in labour and equipment because we know that our clients want 3D prints of large elements," explains Morten Dahl, owner of the company that he founded 20 years ago.

Last year, he hired engineer Jonas Bo Friis Andersen to upscale the company's 3D print capacity. Successfully. MDT A/S can print elements that measure $1.5 \times 1 \times 1 m$, and their newest printer can print up to $3 \times 2 \times$ 1.5 m.

Robots do 3D printing

In essence, both large printers apply the same technology as that used in the eight small 3D printers at MDT A/S, although robots manage the printing process. It takes some tricky programming to get software and robot to speak the same language. Jonas Bo Friis Andersen was responsible for this process and both robots are now printing large elements.

"Using three sizes of printer, we can resolve any 3D print job you care to mention. Even our medium-sized print capacity is rare in Denmark and there are very few of the largest 3D printers in the world. 3D printing is developing fast in the USA, Canada and the Netherlands but most projects are backed by large universities, who help to finance them. We have invested and developed both large machines in-house and at our own expense," says Morten Dahl. He is 49 years old and has owned MDT A/S for 20 years.

In future, he will no longer keep good stories secret. Instead, he intends to tell companies in the offshore industry – oil & gas, and wind – that MDT A/S in Kolding prints not only small 3D elements, but also very large ones. 3D printing is faster and more cost-effective than milling or bending an element in steel. In some cases, an element printed on a 3D printer costs only one-third of the price of the same element made of steel.

"We wish to spread the word that we do something that offshore companies may need. We want to tell them that we can offer new clients new opportunities. They wouldn't normally consider 3D printing to make large elements. We want to help change this," says Morten Dahl.

The client is welcome to bring his own drawing of the element he wants printed in 3D.

"However, we are equally capable of developing an element from idea to print," says Jonas Bo Friis Andersen, Design Engineer at MDT A/S.

Before founding MDT A/S, Morten Dahl's employers included Electrolux and LM Windpower. Over the years, MDT A/S has supplied lightweight designs for use in testing wind turbine blades, and the company consistently runs development projects, including surface treatment and lifetime tests, to meet its own and clients' purposes.

www.flexible-products.dk

MDT III Flexible Products

