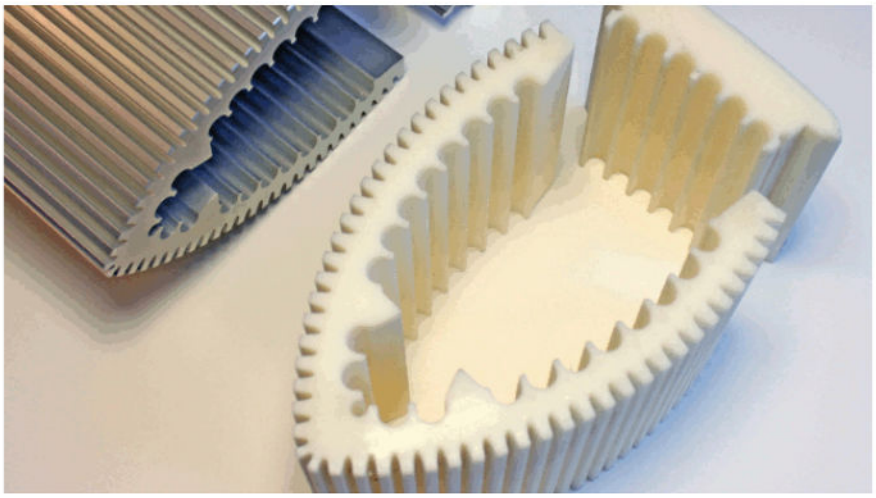


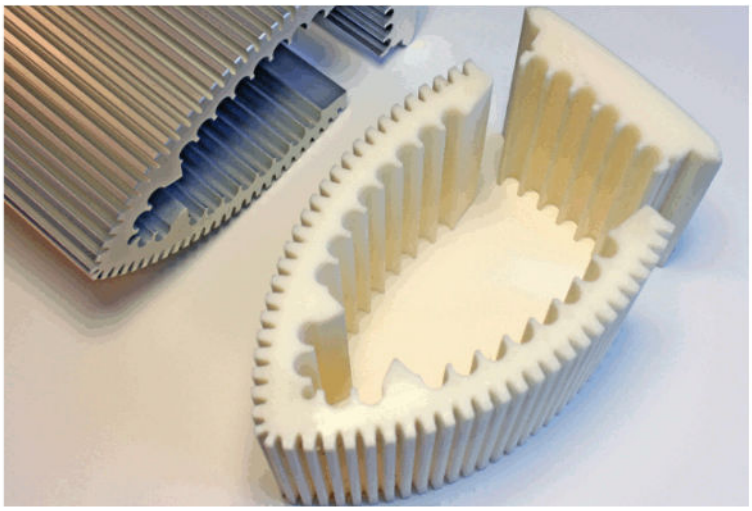
FEATURES PRODUCT DESIGN PROTOTYPE

Loud and clear

D3D Posted on January 13, 2015 by DEVELOP3D 0

There are people who listen to music and there are audiophiles – the difference is roughly the gap between the weekend guitar plucker and Eric Clapton.

Poul Hansen of Ambitious Audio Design, based in Aalborg, Denmark, is firmly in the latter camp, and has been since he was ten years old. That's when he first heard classical music coming from a pair of Quad 57 speakers and a tube amplifier.



A 3D print and aluminium cast version of the post attachment for the loudspeaker

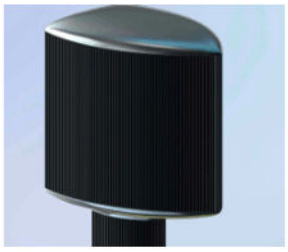
"After that I had a growing interest in reproducing music in a 'life-like' way," says Hansen, "with a special interest in the electro-acoustic or loudspeaker process. Over almost 40 years I've probably built about 100 speakers.

" For a long while Hansen went the traditional route of creating speaker cabinets using mediumdensity fibreboard (MDF). But like some other high-end speaker makers, he found that MDF did not have the stiffness needed to transmit the energy generated by the driver or speaker.

Realising the dream

With the help of long-time friend Kim Tranholm Nørgaard and 3D printers from 3D Systems, Hansen is on the cusp of realising a dream: transforming 175kg of premium aluminium into the Ambitious 1 loudspeaker

weighing in at 58kg and containing components the company claims are second to none.



The prototype Ambitious 1 loudspeaker. To expand image click here

Ambitious uses 3D printed prototypes created by Nørgaard's company, Protoshop, to assess design of the loudspeaker's enclosure, stand and driver frame. These parts are critical not for what they do, but for what they shouldn't do.

"We have developed a very rigid, well-damped and heavy enclosure," says Hansen. "This is very important for producing music without distortion and colouration. Nothing but the cones [membranes] should make music. It's much more difficult than it seems."

Nørgaard had no previous experience in loudspeaker design, but has more than 20 years experience in industrial design of all kinds, including windmills, trucks, solar panels and GPS antennae. He formed Protoshop in late 2013 to help customers turn ideas into reality.

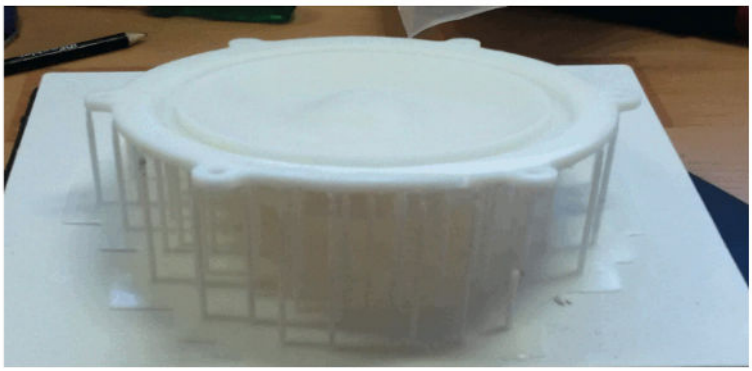
His key tools are SolidWorks 3D CAD/CAM software and the ProJet 1500 3D printer from 3D Systems.

The ProJet 1500 is a network-ready printer with an intuitive web browser that enables shared access across any design or engineering enterprise. It has a very fast build speed of .5 vertical inches per hour in standard mode and .8 inches per hour in highspeed mode.

Bringing the design to life

The Ambitious 1 has many unique characteristics, some of which Hansen will enumerate and most of which he keeps a secret.

There are no parallel sides on the cabinet. The crossover – a device that splits the audio signal into separate bands for routing to the speakers – is mounted in the stand to minimise magnetic influence. For aesthetic reasons, there are no sharp edges or visible bolts or screws.



Using a 3D print from the 3D Systems ProJet 1500 to review the driver design

The Ambitious 1 design process starts in a traditional way, then moves into the digital environment and back to the physical world via 3D printing.

"We have long meetings where we draw on paper, sometimes on a whiteboard," Nørgaard says. "Sometimes we Google for design ideas or look at pictures we have taken of cars, buildings, even door handles – all kinds of stuff.

I then try to visualise the design in 3D using SolidWorks, and Poul Hansen says go or no go."

The final prototype is printed on the ProJet 1500 in a strong durable plastic: VisiJet FTI Ivory material "Ambitious Audio Design has access to many expensive tools to extrude aluminium for its loudspeakers," says Nørgaard.

"Before committing to costly manufacturing, we print designs in 3D to make sure that the shape and fit are exactly what Poul wants."

After Hansen approves the model, Nørgaard designs the metal extrusion tools and has them made by a subcontractor. Six different parts made from heavy-duty extruded aluminium are produced on a three- or five-axis mill, polished and finally anodised in different colours.

The final enclosure mixes aluminium with stainless steel, brass and carbon fibre that Hansen says provides the perfect foundation for high-end performance.

He won't say what goes into the components and drivers inside the cabinet, only that they are developed

LATEST CONTENT

e-Stage software launched by Materialise for metals LPBF 3D Printing

March 7, 2024

Zoom-enabled SmartScan VR800 3D scanner focuses in on productivity

March 6, 2024

Renishaw Agility CMM range adds 5-axis S and L models

March 6, 2024

Stratasys acquire Arevo IP for carbon fibre 3D Printing

March 4, 2024

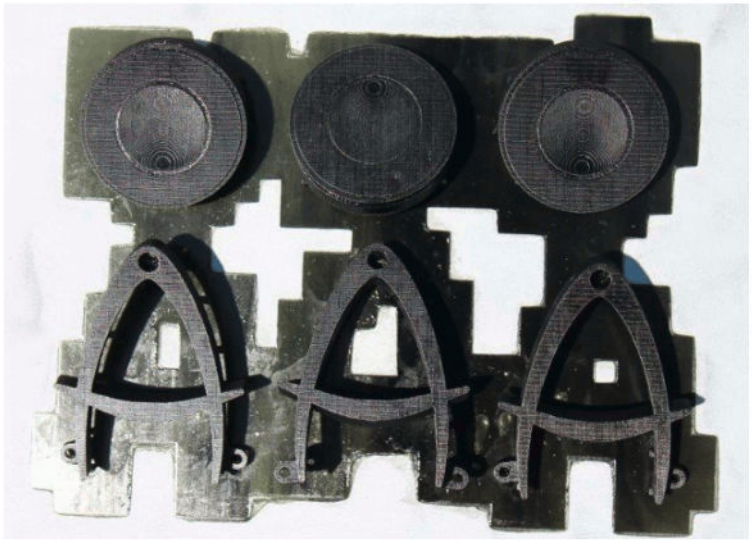
Velo3D 'unlocks full transparency' for Flow AM software with Developer

March 4, 2024

with the help of specialists and are unique to Ambitious.

Money is no object

A prototype of the Ambitious 1 loudspeaker was shown at the High End audio show in Munich, Germany, in May 2014.



A 3D print off the Projet showing the tweeters and logo for the loudspeaker

The first production speaker is slated to debut in May 2015 at the same show. In the meantime, nothing is set in stone.

"We will never stop the development of speakers," says Hansen. "Ambitious 1 is almost ready for production but we are still testing different parts to find the right solution.

The Ambitious 2 prototype will be introduced in 2015 and yes, we will use 3D printing."

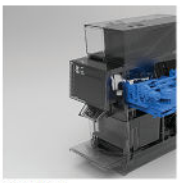
As for price, Hansen says the target is €50,000 for a pair, but he hedges his bets by adding "that may not be possible..."

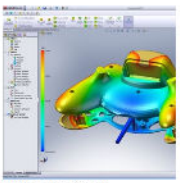
Ambitious Audio Design brings its loudspeaker to life
Default

Related articles:


Develop3D Live 2014 report


Tutorial: Geomagic Studio and Freeform in action together


Busy bean


New SolidWorks Integrated mould filling analysis


The light fantastic


Crunching skulls

European roundtable: Sustainable design


HP - Bold impressions

ALSO ON **DEVELOP3D**