

Sound Decision

3D Printing Enables Design Freedom for Superior Sound

Among other things, the success of a motion picture depends on great imagery and sound. To Didier Kwak, a notable in the French audio-visual industry, only the highest resolution imagery and audio will do. Some years ago, Kwak began to realize the quality level of the available acoustic technologies was not on par with visuals. This spurred Kwak to embark on an acoustic journey in a field called “psychoacoustics,” or the perception of sound and its physiological effects.

The decrease in audio quality Kwak had observed since the 1970s, was due in large part to the industry’s use of cheaper materials by audio system manufacturers as well as the rise of digital music streaming services. “For years, manufacturers have developed increasingly powerful devices while using substandard materials. Consequently, the output does not meet quality expectations.” Undeterred, Kwak embarked on a sound journey to create his own personal audio system using wood and metals.

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Didier Kwak
Askja Audio



Askja can customize the surface with 3D printed ridges, enabling different “skins” for customers, such as leather

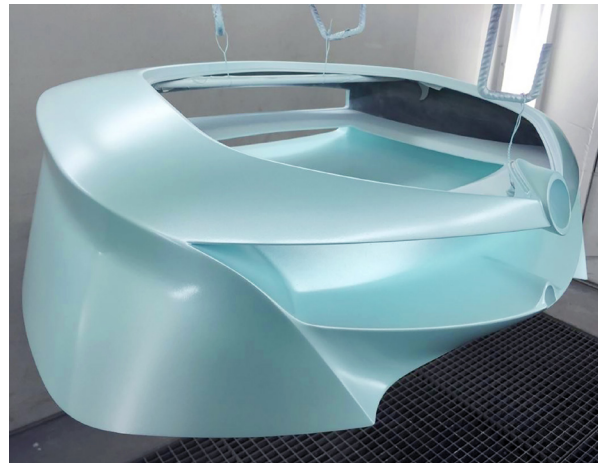
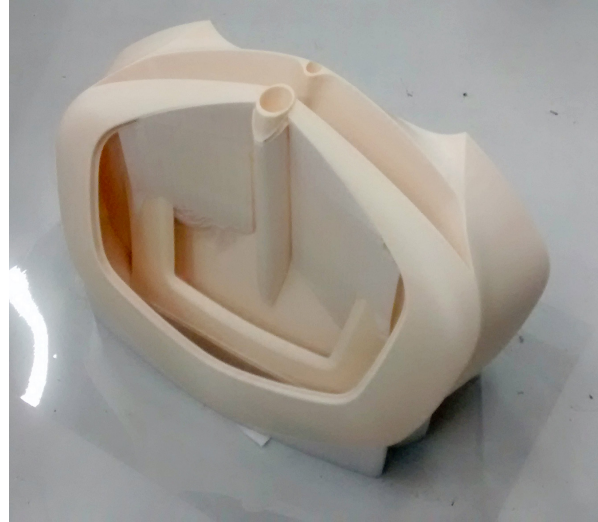


The Sound of Change

Innovation is rarely without its challenges, however, and although Kwak received positive feedback from industry colleagues on his homemade effort, there was still a ways to go in developing a product that would, in his words, “bridge exquisite sound and art.” With the express purpose of developing an ultra-high-end audio system that would meet his exacting standards, Kwak founded Askja Audio in 2014.

Beginning with perfecting the sound quality, Askja Audio began work with Swiss Fibertec, a company specializing in carbon fiber designs and composite molds. It became quickly apparent that the choice of materials, size, shapes and the manufacturing processes themselves presented a fundamental challenge. Namely, the manufacture of the hybrid amplifier’s unique design. To achieve a superior sound quality together with an aesthetically pleasing look, Askja’s designers realized the complex design of the large format amplifier incorporated an unusual curved shape that made it nearly impossible to manufacture traditionally.

Additionally, the amplifier was designed in multiple parts requiring joint assembly. The challenge here was that any imperfection would not only affect the look but also the vibratory continuity vital to achieving a perfect sound. For Kwak, wood and metal weren’t the answer and neither was traditional manufacturing.



Top: Amplifier part 3D printed in ULTEM™ 9085 resin. Bottom: Final painted, 3D printed, amplifier part.

The sound company researched this challenge and discovered the design freedom of 3D printing would allow them to produce any shape they came up with, with no geometric limitations. “This capability proved to be the cornerstone to realizing the design and production of our hybrid amplifier, filters, and power supply unit,” said Kwak.

Needing a large build size, Askja Audio turned to the Stratasys Fortus 900mc™ 3D Printer, a system capable of producing very large, complex parts. They used ULTEM™ 9085 resin and ASA materials which gave them the dimensional stability and toughness to enable the audio signal to travel in the electronic components without mechanical distortion from the enclosure. Any distortions can alter the electronic qualities of components and ultimately, sound quality.

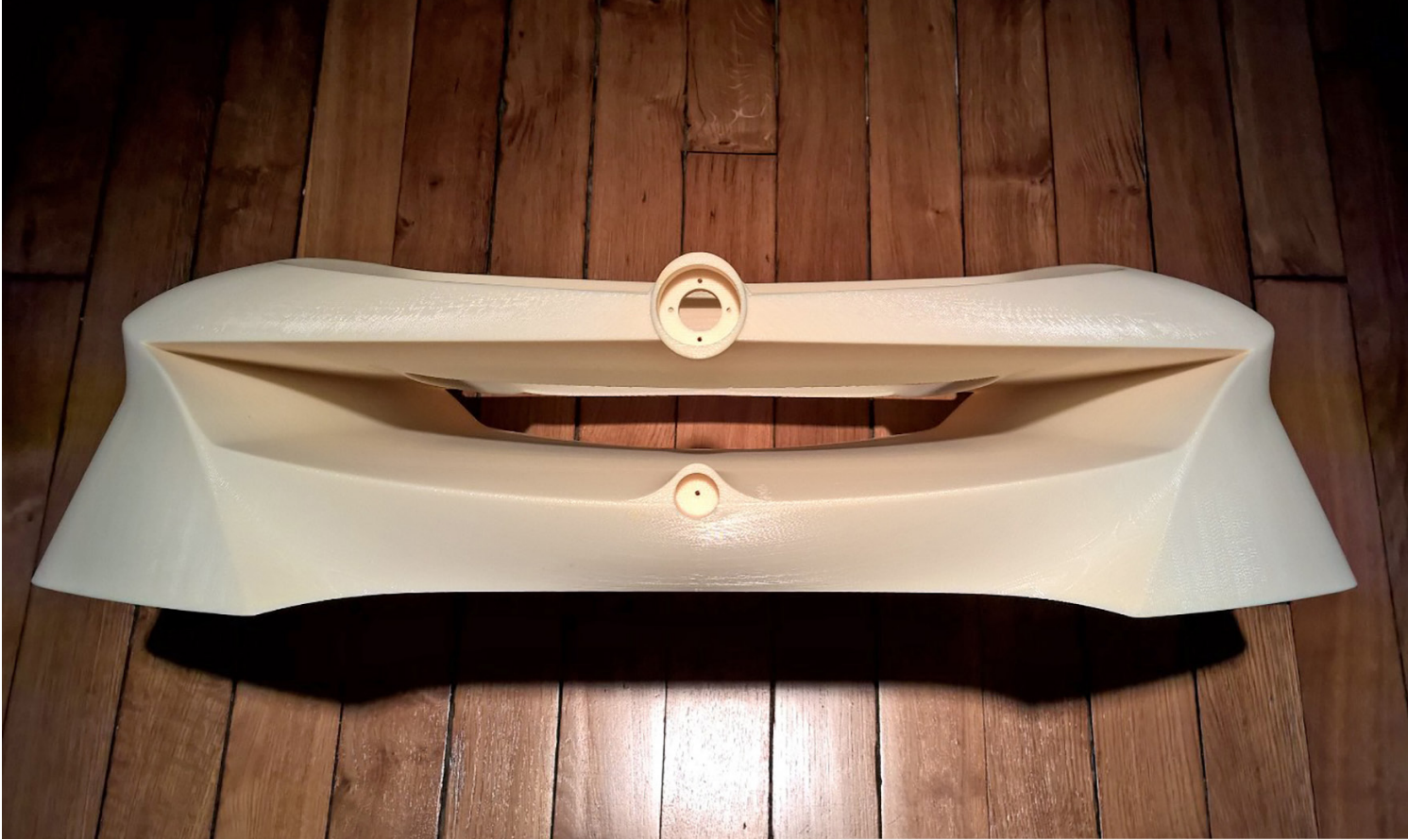
Askja was also able to redesign the complex part assemblies, consolidating them to just a few large parts. “The Askja “Origin” hybrid amplifier is one of the biggest parts and features a complicated, unusually-shaped design – two issues that made it virtually impossible to produce via conventional methods. We were looking at several months’ wait and an incredible amount of expense just to produce the tooling,” Kwak said.

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Askja's luxurious Origin hybrid amplifier.



Finally, additive technology enabled Askja to add surface customization options for customers, without compromising the efficiency of the sound system. "...the use of additive manufacturing to permit clients to customize their own design is a tremendous asset," said Kwak. "The use of Stratasys FDM 3D printing enables us to bring our creative design aspirations to reality and beyond that it also forms a great part of Askja's unique selling proposition, as no other audio system companies have ever designed their final products with additive manufacturing."

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Didier Kwak
Askja Audio

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