

"Since purchasing the Eden350 3D printer system, we have drastically cut down our processing time from one day to between eight and ten hours. Now, we can use a single Eden350 3D printer system in-house to print all 3D shapes without the need for any post-process work"

**Shin, Jin-Sik,**  
Senior Research Engineer



## Case Study

### At a Glance

- Company:** ESTec  
**URL:** [www.estec.co.kr/HTML\\_eng/](http://www.estec.co.kr/HTML_eng/)  
**Location:** Korea  
**Industry:** Audio systems for home, auto and commercial environments

### Challenges

- Need to create diverse and complex 3D prototype shapes with high accuracy and detail. Reduce design and manufacturing costs and time.

### Solution

Eden350™ 3D Printing System  
from Objet Geometries

### Results

- Processing has been reduced from one day to less than ten hours
- In-house 3D printing capabilities save \$150,000 in rapid prototyping costs (75% cost reduction)
- Increased flexibility due to wide range of materials with varying properties and colors
- Ability to rapidly print any 3D shape with high resolution
- Significant time and cost savings thanks to highly accurate models that need no post-process modifications

## ESTec amplifies innovation and tunes down costs with Objet 3D printing system

At ESTec, a leading Korean manufacturer of high-quality audio systems, total commitment to providing an extraordinary sound experience has been a driving theme behind the company's evolution since its establishment in 1971. Its wide spectrum of innovative products includes automotive audio systems, home audio systems, display audio systems, micro acoustic transducers (used in mobile appliances), multimedia and PA speakers, amplifiers, and more. With production facilities in Vietnam, Malaysia and China, as well as Korea, and a distribution channel in the USA, ESTec is now a dominant player in the audio systems market.

The development and perfection of such a diverse product range means that ESTec needs to take multiple market segment demands into account during the design-to-manufacture cycle. In addition to creating audio systems that are both functional and pleasing to the eye, each segment has its own set of requirements that needs to be adhered to. For example, the trend in the area of home audio systems is moving toward HDTV and high-quality slim speakers to support home theater with multi-channel speaker systems. For the automotive speaker industry, the speakers need to be designed according to stringent safety considerations and must be resistant to environmental factors such as high and low temperatures, humidity, and dust. Creating equipment that comprehensively answers the needs of each separate market requires real-life testing with prototype materials. This ensures that the testing process is accurate and the end product fully answers customer and environmental needs.

### Optimized quality, full flexibility and major cost savings

Before purchasing the Eden350 3D printer, ESTec's prototypes were produced using outsourced CNC machining, which involved annual costs of more than \$200,000. In addition, the quality of the CNC output depended on the operator's skill and there were often delays and inconsistencies in the design and manufacturing process.

The Eden350 was installed at ESTec in December 2006 and since then has proved to be a real workhorse. "The machine has been running for nine hours every day for the past three years," comments Shin Jin-Sik, Senior Research Engineer at ESTec. "That's 10,000 hours of operation since it was installed, proving to us that the Eden 3D printer is very durable."





In 2008, ESTec saved \$150,000 – a 75% cost reduction – by using the Eden350 printer system, which enables in-house rapid prototyping and completely eliminates the need for post-progress modifications. ESTec also reduced the mock-up time of its product from 24 hours to less than 10 hours, thereby speeding up its end product delivery schedule, increasing its ROI and competitive power, and providing maximum value to customers in far less time.

Shin Jin-Sik says: "In most cases, such a drastic cut in costs means that quality is compromised. But not in the case of the Eden350. With this 3D printing system, we get the best of both worlds. Without any programming expertise, our designers can easily create any 3D shape, with detailed 16-micron (0.016mm) layer thickness, excellent precision and high resolution. With outsourced CNC machining, we had to create undercut parts post-process using superglue. And, when prototypes came out wrong we had to use putty to fix them."

**"Now, the models come out the first time, so we are no longer wasting time correcting and redoing them. Add the wide variety of material options, including several different colors, to this combination and we've got the perfect solution for creating in-house product prototypes for testing."**



The Eden350 3D printing system was designed to provide high-quality, 3-dimensional models quickly and conveniently throughout the design-to-manufacturing cycle. It supports the full line of FullCure® model and support materials – including the opaque VeroBlue, VeroWhite and VeroBlack families of materials, as well as the flexible rubber-like TangoGray, TangoBlack, and TangoBlackPlus families, and more. This is a major advantage for ESTec as materials flexibility is required to support model and part creation with varying properties, while maintaining the same high quality regardless of material choice.

### Creating an enhanced work environment

One of ESTec's principal goals is to create a great workplace for its employees – yet another reason why purchasing the Eden350 printing system fit in so well with its company profile. The Eden350 3D printer system is small enough to easily fit into a room at ESTec's production facility, so that all prototypes can be produced in-house and the room can be easily cleaned.

All FullCure material cartridges are loaded and removed through a front-loading door. With this safe, clean and non-contact way to handle all materials, the Eden350 3D printer is easy to operate and greatly enhances working conditions for ESTec employees. steps.



### About Objet Geometries

Objet Geometries Ltd., the innovation leader in 3D printing, develops, manufactures and globally markets ultra-thin-layer, high-resolution 3-dimensional printing systems and materials that utilize PolyJet™ polymer jetting technology, to print ultra-thin 16-micron layers.

Objet's solutions enable manufacturers and industrial designers to reduce cost of product development and dramatically shorten time-to-market of new products. Objet systems are in use by world leaders in many industries, such as Education, Medical / Medical Devices & Dental, Consumer Electronics, Automotive, Toys, Consumer Goods, and Footwear industries in North America, Europe, Asia, Australia, and Japan.

The market-proven Eden™ line of 3D Printing Systems and the Alaris™30 3D desktop printer are based on Objet's patented office-friendly PolyJet™ Technology. The Connex™ family is based on Objet's PolyJet Matrix™ Technology, which jets multiple model materials simultaneously and creates composite Digital Materials™ on the fly. All Objet systems use Objet's FullCure® materials to create accurate, clean, smooth, and highly detailed 3D parts.

Founded in 1998, Objet serves its growing worldwide customer base through offices in USA, Mexico, Europe, Japan, China and Hong Kong, and a global network of distribution partners. Objet owns more than 50 patents and patent pending inventions. Visit [www.objet.com](http://www.objet.com).

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