

AT A GLANCE

Company: ONCE**URL:** www.once.es**Location:** Madrid, Spain**Industry:** Non-profit specializing in helping blind people and others with visual disabilities.**Challenges**

- > Creating models of products that are sturdy enough to be tested tactilely and feel very similar to the final product
- > Ensuring time and cost effective design phases
- > Finding a rapid prototyping machine machine that is both easy to use and office friendly

Solution

Eden 350V 3D Printing System from Objet Geometries

Results

- > Reduced cost for prototypes
- > Accelerated decision making on prototypes
- > Reduced response time for modifications and changes
- > Stronger, more accurate prototypes than were previously available



“
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”

Gema Carrillo de Albornoz Nuño
Manager of the Design Office

Spanish Center for Braille R&D Use Objet 3D Printing System In-House to Accelerate Tactile Testing of Products

Creating products for the blind and visually impaired is a time-consuming, expensive process. The manufacturing quantities are smaller than regular products and the models have to be tested tactilely, since they will be touched, rather than seen. As such, the need for models to feel like the final product is of utmost importance. These specific characteristics make product development more complex than usual.

The Spanish National Organization for the Blind (ONCE), a non-profit corporation focused on improving the quality of life of the blind and people with visual disabilities throughout Spain, works to develop special products for the blind population. It has lowered its design costs and timeline by using Objet Geometries' 3D printing technology in-house.

As an institution with a social and democratic character, ONCE is open to all and it prides itself on providing solidarity with people affected by disabilities other than blindness. Run democratically, it also works hand in hand with the Spanish government through the Ministries of the Economy, the Budget, Work and Social Affairs and the Interior. Inside ONCE, the Centre for Braille Research, Development and Application (CIDAT) is responsible for carrying out research and development, manufacturing and evaluation of special devices that help resolve difficulties in the daily life of people with a visual disability.

The majority of technical visual aids in Spain are produced by ONCE-CIDAT. Traditionally the development of products for the blind and for people with other disabilities has been marginalized by the industry due to the small manufacturing runs plus the difficulty and cost of designing the prototype. In the case of the blind the aesthetic aspects, which are tactile rather than visual, are designed together with the ergonomic aspects. This means that the first prototypes must feel very similar to the final design. This requires that techniques usually used for the manufacture of finished goods for production in miniseries be used early in the design process. This is why ONCE chose to work with Objet technology. Objet's Eden350V produces true-to-life models which accurately replicate the final product in function, fit, and feel.

The demand for products that were typically out of reach for the blind and visually impaired has increased significantly as a result of their greater integration into the general community. This situation requires the development of common articles and technologies with certain adaptations to provide concrete solutions to problems occurring with day to day use. ONCE used Objet technology to develop a number of specialty items for the blind and visually impaired, such as a keyboard with Braille, a Sudoku game with numbered pieces written in Braille and a special computer mouse.

Unfortunately, the demand for a wider range of more complicated products has resulted in significant price increases due to the more expensive modeling processes involved. The higher prices then make the items unfeasible to manufacture and ultimately many of them are withdrawn from production.



Objet 3D Printer Solves ONCE's Dilemma

Over time, ONCE-CIDAT installed a variety of tools to improve the various phases of production. However, its largest dilemma remained – the need to make manufacturing of prototypes more time and cost efficient. With designs being sent to agencies for model creation, changes were expensive and time consuming. ONCE realized that it needed a 3D printer in-house to create tactile-realistic models for testing, and that the printer needed to be easy to use in an office environment, with dimensions appropriate for the space available. The characteristics of the products developed in ONCE-CIDAT meant that the machine and materials should be capable of producing both rigid and flexible parts, with sufficiently good mechanical properties to develop prototypes and short series of a product.

ONCE conducted a thorough study of rapid prototyping and concluded that a system based on the curing of material by ultraviolet light was ideal. After considering all the options, ONCE chose Objet technology for its accurate model creation and small footprint. The quality, in terms of physical appearance and mechanical properties, obtained with Objet's resin was repeatedly noted to be better than that of other technologies.

Objet Models Eliminate Design Bottlenecks

"Before purchasing Objet's Eden 350V, we worked with outside providers of rapid prototyping services – which meant a long waiting time before being able to test. The unexpected boon of having the Eden350V in-house was the elimination of our biggest design bottleneck, the reduction in response time when introducing modifications into the intermediate prototypes. We can now test and make changes in a significantly shorter amount of time." Gemma Carrillo de Albornoz Nuño: Manager of the Design Office

Other benefits include:

- > Improved decision making – The products currently being developed with Objet by ONCE include prototypes of various kinds: housings for electronic devices, parts for mechanical assemblies, games, and parts made of elastic materials. For all these products, using Objet's Eden 350V in-house has made the decision-making processes more agile and flexible, as it has enabled immediate confirmation of the design by the end user.
- > Immediate testing – Blind testers are now able to work with ONCE's models produced by the Eden350V 3D printer immediately, rather than waiting for the prototype to come back from the 3D printing agency. The testers have been very satisfied with the quality of the pieces, stating that their high expectations of accurate shape and feel were met.
- > More resilient models – Objet's models have also proven to be stronger than the previous prototypes used by ONCE. They noted a difference with other prototypes which were used before, namely that the thickness of the shell, being greater, used to make prototypes weaker, to the point where the prototype shells would break. This does not happen with models developed with Objet's technology. The Eden 350V has given ONCE the ability to obtain a prototype directly, accelerating decision making time considerably and eliminating the principle bottleneck in the design department.

ONCE creates items which help the blind and visually impaired in their daily life. Thanks to Objet the organization can now design more accurate models faster and more cost effectively – and thus creating a wider range of products to help the blind and visually impaired, making their daily lives easier.



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.

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. Connex500™ 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 3-dimensional models.

Objet's solutions enable manufacturers and industrial designers to reduce cost of product development cycles and dramatically shorten time-to-market of new products. Objet systems are in use by world leaders in many industries, such as automotive, electronics, toy, consumer goods, and footwear industries in North America, Europe, Asia, Australia and Japan.

Founded in 1998, Objet serves its growing worldwide customer base through offices in USA, Europe and Hong Kong, and a global network of distribution partners. Objet owns more than 50 patents and patent pending inventions.

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