

SMILING FACES



Leone Develops Innovative Inverse Approach for Implantology Surgical Guides

“Our Objet 3D Printers are enablers for innovation. We have established a new business line ensuring a well-balanced quality/cost service to our customers.”

— Gabriele Scommegna, Leone

Leone now employs 3D printing to produce surgical guides for implant surgery

Background

Correct positioning of dental implants requires intricate planning involving anatomic limitations and restorative goals of the implant process. CT scans assist in diagnosis, providing information for surgical guides to help improve implant placement precision. Traditionally, the guides are constructed manually. However, the use of advanced technologies, most notably 3D printing, is part of a broader trend toward a digitized dentistry workflow.

Leone S.p.a., one of Europe's leading manufacturers of orthodontic and implantology products, works on the cutting edge of dental technology. Most recently, it developed a new approach to making surgical guides for implant surgery.

The Challenge

In surgical planning, identification of fundamental structures such as the inferior alveolar nerve, the sinus, or the shape and dimensions of the bone. Therefore, once the virtual implant planning is done, the use of implantology surgery guides helps the clinician to accomplish the treatment plan.

Leone helped dental labs improve the precision of its surgical guides while leveraging the knowledge and experience of its skilled dental technicians. Having invested in two Objet 3D Printers in 2011, the company saw an opportunity to combine the benefits of manual surgical guide construction with the advantages of digital technology.

The Solution

Using the data from CT scans and its Objet Connex 3D Printer for multiple materials, Leone created precise models of patients' jaws, including the bone, teeth, gums and underlying structures. It uses Objet's MED610 transparent material to print the jaw

At a Glance

Challenges

- Create high-quality master dental implant models for lab surgical guide production
- Leverage technology advances to bring new added value to dental labs
- Continue to innovate as a way to maintain market leadership

Solution

- Objet Connex350™ Multi-material and Objet Eden260V™ 3D Printer

Results

- Faster and more streamlined master model manufacturing process improves service to customers
- Objet multi-material 3D printing has expanded opportunities for innovation and new product development
- Innovative offering of 3D-printed surgical guide models has opened a new business line while enhancing Leone's value to dental labs

bone and rigid, opaque material for the internal structures, such as veins and nerves. All elements are printed together in a single run, creating a complete, anatomically detailed model.

The models are printed with precisely located and sized holes where the implants will be placed, and then are delivered, together with implant sleeves, to the lab. The dental technician positions the sleeves on each model, pours biocompatible material into the sleeves, and builds the surgical guide.

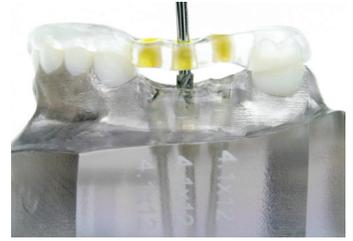
“When we first considered investing in an Objet 3D Printer, we were impressed by the accuracy of the technology, and the high-quality and smooth surface finish that we could achieve,” says Maurizio Dolfi, director of production at Leone. Then, seeing that digital dentistry with Objet 3D printing could enable Leone to enhance its existing offering and also explore new products and services, the company decided to purchase two machines, to give it more options.”

The Value

“The Objet Connex 3D Printer, with its multi-material capabilities, has enabled us to investigate novel techniques and develop new products, opening up new lines of business for Leone,” says Sara Savasta, technical digital service, Leone. The company’s unique offering of highly accurate and detailed jaw models reinforces Leone’s reputation as an innovator. It also enhances Leone’s value to its dental laboratory customer base. The transparent models printed with multiple materials enable a clear view of the jaw’s internal structures (i.e. sinus and nerves) and how the implant drill hole impacts the jaw as a whole.”

“We believe that dental technicians’ expertise will continue to be valuable, even as dentistry becomes increasingly digital, says Gabriele Scommegna, R&D director, Leone. “Digitally produced surgical guide models are a way that forward-looking dental labs can continue to leverage existing skills while also taking advantage of digital technology advances.”

In parallel with building up its new surgical guides models business using the Objet Connex 3D Printer for multi-materials, Leone is using its Objet Eden260V 3D Printer to gain efficiencies in its more established business by mass producing digital stone models for orthodontic appliances, such as retainers and aligners. This enables Leone to reduce its lead times to customers and improve its cost effectiveness, while maintaining excellent quality.



Objet350 Connex helps Leone create a precise model of a patient's jaw.

Stratasys | www.stratasys.com | info@stratasys.com

7665 Commerce Way
Eden Prairie, MN 55344
+1 888 480 3548 (US Toll Free)
+1 952 937 3000 (Intl)
+1 952 937 0070 (Fax)

2 Holtzman St.,
Science Park, PO Box 2496
Rehovot 76124, Israel
+972 74 745-4000
+972 74 745-5000 (Fax)

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