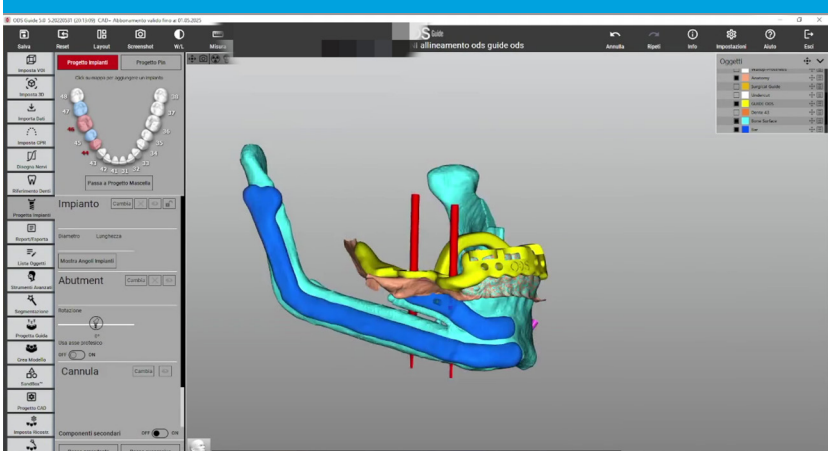
Dental Implant Specialist Digitizes Implantation Process with Stratasys Multi-Material 3D Printing Technology

> “In working on the start-up of Biomec’s digital department, I chose Stratasys’ DentaJet 3D printer because of its fundamental accuracy and reliability.

Giacomo Moretti
General Manager
ODS – Oxy Implant



stratasys

Case Study

One of the enduring benefits of digital workflows is in the creation of one-offs and bespoke solutions. The dental industry was quick to realize the benefits of 'going digital' – after all, no two patients are identical and a 'one-size-fits-all' approach is rarely appropriate. Italy-based dental implant specialist, Oxy Implant, has established a dedicated digital department to develop clinical and technological innovations with Stratasys PolyJet technology that positively impact patient outcomes far beyond traditional implants.

Over the last decade the focus of restorative dentistry has moved from the implant – the unseen part of an intervention – to the prosthesis. To respond to this shift, Oxy Digital Solutions (ODS) has leveraged the flexibility, accuracy and reliability of Stratasys DentaJet 3D printers to develop advanced custom-made solutions that accommodate the new needs of digital implantology.

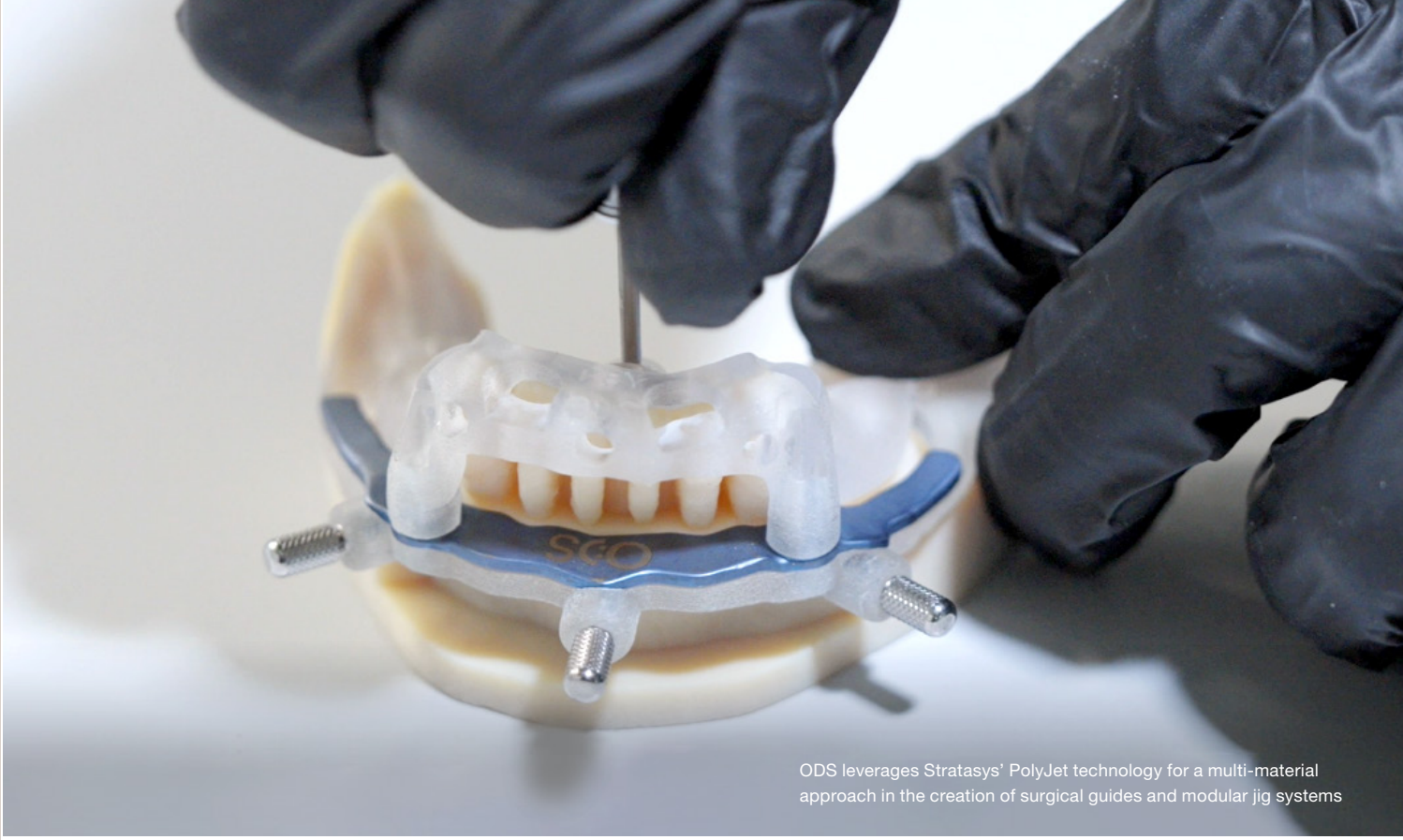
Building digitization into dentistry

Since it was established in 1990, Biomec – Oxy Implant™, the parent company of ODS, has stayed at the forefront of digitalization as it has become a larger part of the overall dental industry. The company launched ODS in 2021 as an in-house digital workflow department with the objective of supporting oral surgeons and dental labs in the step-by-step implementation of digital workflows. Now with a staff of eight, ODS brings diverse competencies covering dental technicians, engineers, and practical and business support staff to assist surgeons and labs with a whole host of tasks. These include intraoral scanning, cone beam computed tomography (CBCT) data matching, surgical planning, and the 3D printing of surgical guides.

Implants become just part of the process

With the industry's paradigm putting the prosthesis at the center of the rehabilitation plan, the best practice workflows must run backwards from the desired prosthetic outcome to develop a plan for achieving this goal.

To respond to this change, Biomec began to work on implant fixtures with designs optimized for this type of working philosophy. An implant line was developed among the Oxy Implant™ series that exclusively accommodates the needs of digital implantology, the Fixo™ Line.



ODS leverages Stratasys' PolyJet technology for a multi-material approach in the creation of surgical guides and modular jig systems

3D printing at the heart of innovation

To help build out the new digital department and drive the Oxy Implant Series, Biomec turned to Giacomo Moretti, General Manager, ODS – Oxy Implant. Through his past experience in dental implants and analysis of multiple technologies, he was able to quickly identify the Stratasys DentaJet 3D printers as the best platform around which to build the new suite of capabilities.

The Stratasys 3D printers leverage PolyJet™ technology to print multiple materials at the same time, meaning biocompatible surgical guides, dental models, prosthetic models and flexible gingiva masks can be produced on the same system, concurrently. The Stratasys J5 DentaJet and J3 DentaJet 3D printers deliver remarkable accuracy on each dental part, which is critical for implantology cases. The J5 DentaJet also offers the ability to 3D print in full color, which can aid with pre-operative planning and high-fidelity teaching models of real-life cases.

"In working on the start-up of Biomec's digital department, I chose Stratasys' DentaJet 3D printer because of its fundamental accuracy and reliability," Moretti says. "The level of precision we can achieve thanks to the combination of the PolyJet printing technology, specialized resins and support encapsulation make it possible to create complex geometries that do not risk being damaged during finishing, a potentially big source of inefficiency with other systems. The Stratasys Partner Reseller, Overmach, understood our requirements thoroughly, and were responsive and highly supportive too."

In a standard application of 3D printing in implantology a traditional guide would be printed with metal bushings that allow the guided placement of dental implants in patients who have missing teeth. However, by leveraging the efficiency and extreme precision of PolyJet technology, ODS has developed a multi-material approach to creating modular jig systems to advance digital workflows which is both quicker and cheaper than traditional alternatives.

Beyond traditional dentistry

By facilitating digital workflows and providing hands-on support for their application, ODS has used 3D printing to develop strategies that allow not only implant placement, but also targeted biopsies, corticotomies, soft tissue harvesting, and sinus antrostomies.

In partnership with the San Paolo Hospital in Milan, ODS has harnessed the accuracy and material choice of Stratasys' DentaJet 3D printer in the rehabilitation of post-oncological patients who undergo massive jaw restoration after bone cancer. The bone tissue reconstruction with fibula grafts, micro-vascular surgery to improve grafting suitability, and subsequent implant rehabilitation is enabled by ODS' unique technologies, workflows and personnel.

Embracing new challenges

As implantology, dentistry and restorative surgery continue looking to solve increasingly complex challenges, the supporting digital workflows become a fundamental part of the clinical process. By harnessing 3D printing technology, dental and maxillofacial surgeons can achieve patient outcomes that have an immensely positive impact on quality of life. Tools like Stratasys DentaJet 3D printers, combining exceptional accuracy and multi-material capabilities, become an indispensable aid to surgery at all stages of this journey.

> To replace a partial or full jawbone, the patient's fibula is used to create a new mandible. Using our DentaJet 3D printers we are able to design and produce biocompatible cutting jigs to cut the correct portion of the fibula and vessels.

Giacomo Moretti
General Manager
ODS – Oxy Implant

ODS uses Stratasys' PolyJet printing technology for the rehabilitation of post-oncological oral cancer patients

USA - Headquarters
7665 Commerce Way
Eden Prairie, MN 55344, USA
+1 952 937 3000

EMEA
Airport Boulevard B 120
77836 Rheinmünster, Germany
+49 7229 7772 0

ISRAEL - Headquarters
1 Holtzman St., Science Park
PO Box 2496
Rehovot 76124, Israel
+972 74 745 4000

ASIA PACIFIC
7th Floor, C-BONS International Center
108 Wai Yip Street Kwun Tong Kowloon
Hong Kong, China
+ 852 3944 8888

GET IN TOUCH.
www.stratasys.com/contact-us/locations

stratasys.com
ISO 9001:2015 Certified