



JUNE 2016
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DO YOU HAVE A DIGITAL TOOTH?

ASIGA PRESENTS NEW DEVELOPMENTS
IN DIGITAL DENTISTRY

ACCELERATING 3D TECHNOLOGIES



ASIGA'S CEO JUSTIN ELSEY
DISCUSSES NEW DEVELOPMENTS IN

3D printing for digital dentistry

WORDS : JUSTIN ELSEY, CEO ASIGA

THE CLEAR PLASTIC DEVICE ILLUSTRATED ABOVE REPRESENTS A NEW WAY OF MANUFACTURING A DENTAL SPLINT. SPLINTS ARE WORN TO PROTECT TEETH AGAINST GRINDING DURING SLEEP OR TO PRODUCE AN ORTHODONTIC EFFECT. THE NOVELTY OF THIS SPLINT IS THAT IT WAS 3D PRINTED IN A BIOCOMPATIBLE MATERIAL CERTIFIED FOR UP TO 12 MONTHS IN THE MOUTH. SUCH MATERIALS HAVE BECOME COMMERCIALY AVAILABLE RECENTLY AND ARE TRANSFORMING THE WAY DENTAL DEVICES ARE BEING MADE.

WELCOME TO THE world of digital dentistry, where game-changing innovations are arriving at an extraordinary pace. Dentistry represents a significant opportunity to 3D printer manufacturers like Asiga due to its sheer size. BCC Research reports that by 2019 the global dental market will grow to \$55 billion led largely by advances in digital technology and CAD/CAM equipment.

Dental laboratories are no strangers to digital manufacturing. For more than a decade they have been 3D scanning dental models and using specialized CAD software to design crown and bridge restorations. Milling has traditionally been the preferred method of production as it can be used to shape zirconia, one of the hardest dental ceramics available. 3D printing is becoming more prevalent as the industry moves towards fully digital workflows.

This transition is being facilitated by the advent of intraoral scanners. "We have seen a rapid take-up of our intra oral scanner technology by dentists, implantologists, prosthodontists and orthodontists" explains Flemming Thorup, president and CEO of 3Shape, a developer of 3D scanning technology and design software based in Denmark. "The 3D files are transferred to dental laboratories or used in the dental practice to design and produce restorations."

With the industry going digital there is greater demand for output machines. In this respect there are several advantages of 3D printing over milling. 3D Printing can

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CLARA REGNERI OF DETAX

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produce smaller feature sizes compared to milling which is restricted by the diameter of the milling tool. Furthermore, 3D printing places no restrictions on part geometry whereas milling requires that every point on the object's surface be accessible to the milling tool.

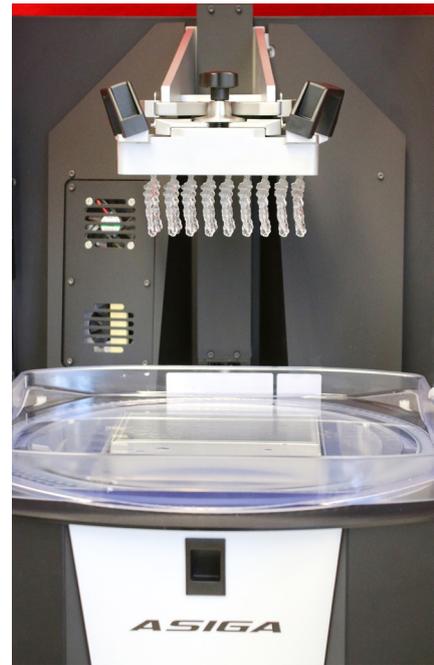
Denis Hamant, director of Kreos, a French distributor of dental CAD/CAM hardware and software, comments "The market is in transition as it assimilates the arrival of intraoral scanners, affordable high-resolution 3D printers and new materials which present exciting opportunities. Ultimately, a fully digital workflow produces better quality and repeatability resulting in improved patient outcomes".

Asiga's clients are using 3D printing for the production of dental models, customized impression trays, surgical drill guides, splints, casting patterns for partial dentures, crowns and bridges. Materials development is central to the adoption of 3D printing in new dental applications.

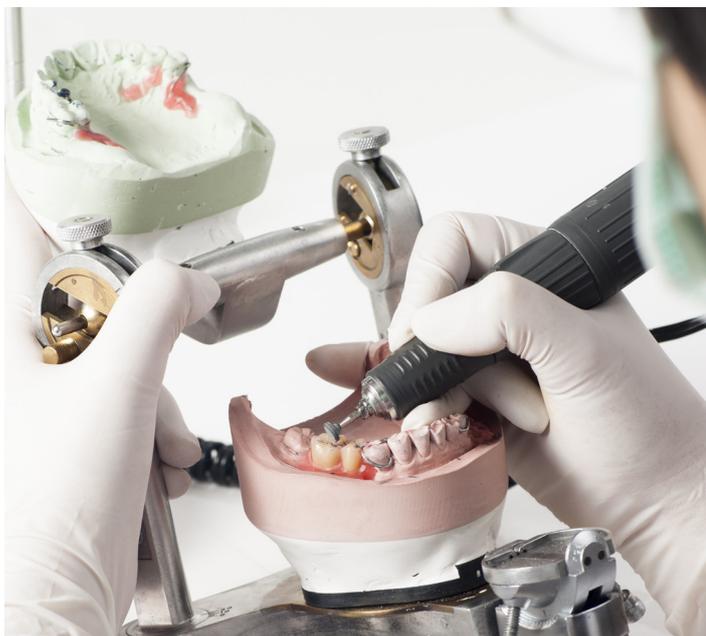
"3D printing provides a high degree of laboratory rationalization as it can satisfy many different dental indications and is also cost-effective" notes Clara Regneri of Detax, a German manufacturer of biomedical materials. "Our newest milestones are the development of biocompatible 3D printing materials for dental splints and temporary crowns and bridges. This will enable 3D printers to be used for chair-side dental applications and prosthodontic treatments."

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AND CEO OF 3SHAPE



▲ **ABOVE:** Dental splints printed on an Asiga PRO2 3D printer using FreePRINT Splint material supplied by DETAX. Picture courtesy of DETAX GmbH.



Dr Martin Klare, CEO of Pro3Dure, a German manufacturer of dental materials is aware of the opportunities new materials present. "Materials with higher filler contents which are also processable in 3D printers are desirable" states Klare. "This will allow the production of dental restorations with long-term stability. New material classes for w3D printers like PEEK and semicrystalline polymers will enable new dental applications."

In an industry where the focus is on integration and compatibility, Asiga has taken the approach of making high-performance 3D printers which are open to materials from third party developers. Users have full access to the printer's operating parameters and materials configuration database allowing new materials to be readily deployed. This permits easy integration into existing workflows and access to the full range of materials now available. ■

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