China Based Dental Manufacturer Prints Superior Veneers with EnvisionTEC Technology

Founded in 2008, Norland Industrial (Norland) is a large scale multinational industrial group which is involved in the health and medical cosmetology industries. Initially concentrating on China, the business has expanded to have presence in 43 countries.

The head office in China's Chaoyang district is at the forefront of dental veneer production. It specialise in porcelain or ceramic veneers (sometimes called dental porcelain laminate), custom-made ceramic shells designed to be placed over teeth to improve their appearance.

Being at the forefront of this industry, the Norland team understands the importance of investing in the latest technologies and techniques to ensure the highest quality products for its customers and keep ahead of the competition.

Why consider 3D printing?

Dentists and labs world-wide are discovering the value of 3D printing and the advantages that 3D technology brings in terms of both improved productivity and the quality of the finished appliances.

Norland produces a range of Veneers, examples of which can be seen here, fitted to a dental model.

Norland industrial

Industry:

Dental/Orthodontic

Machines:

Perfactory 4 Mini

Materials:

E-Dent

Norland previously invested in CNC technology to produce its ceramic veneers. This computer controlled manufacturing resulted in accurate, thin veneers milled from materials such as the feldspathic porcelain blocks. This produced acceptable results, and allowed for the small scale mass production of custom veneers. CNC however is a slow process that produces a lot of wastage. Additionally the machines require frequent maintenance and replacement burs, which are an accepted sacrificial component.

Newer techniques such as 3D printing do not have these same limitations. They are also superior in terms of speed and the quality of the results produced.

Why EnvisionTEC?

The Norland team understood that 3D printing was paramount to staying ahead of the competition and providing customers with consistent quality.

The team looked at a number of competitive products. These included offerings from FormLabs, Rapidshape and a number of local Chinese brands. Both SLA (Laser) and DLP (projector) solutions were examined. Together with the 3D printers, Norland also required a tough resilient material that would mimic the characteristics of porcelain/ceramic.

In terms of printers, none of the competitors provided either the ease of use, speed or accuracy required. Additionally, though the selection of materials were similar to EnvisionTEC's E-Dent, it was considered to produce a far better result.

Veneers produced in E-Dent can be used directly in the mouth. Above, the before and after effect of fitting veneers over broken teeth.

Printed veneers placed on a model. Still displaying the support structures from printing.

> *"Though some of the other manufacturers had similar materials to E-Dent, the EnvisionTEC material was superior."*
> - Dr. Jin. The Chief Scientist in new material development, Norland

After consideration, the team at Norland settled on an EnvisionTEC Perfactory 4 Mini with E-Dent material. This combination provided an unbeatable solution, with the P4 Mini allowing them to produce over a 100 veneers in 1.5 hours. Each piece highly accurate with exceptional surface quality. The machine can even be run day and night, the team having the confidence that they will return the next day to a full print.

Outcome

Norland is currently in the process of gaining CFDA approval for its veneers. This will approve them for use across China and will become a game changer for the veneer business. As the machine is running around the clock in the production of veneers for its customers, there may come a time when they need to move to an even larger machine to keep up with demand.

EnvisionTEC materials and 3D Printers for Dental and Orthodontic applications

EnvisionTEC offers a full range of desktop, full-production and high-speed continuous 3D printers for dentists, orthodontics and dental labs. EnvisionTEC 3D printers deliver tight-fitting crowns and orthodontic models with a best-in-class smooth surface that results in crystal-clear thermoformed aligners.

Paired with an industry-leading materials library, featuring a variety of FDA and CE-approved materials, EnvisionTEC machines offer unmatched flexibility and a complete solution that delivers reliable, proven results.

EnvisionTEC materials

• **E-Denture** - A biocompatible Class IIa material suitable for 3D-printing all types of denture bases.

• **E-Denstone** - A material developed specifically for the rapid production of highly accurate, scannable dental models.

• **E-Dent 100/400** - printing materials for the production of crowns, bridges and veneers for long-term temporary use.

• **Press E-Cast** - A wax-filled material for the production of partial frameworks and full anatomical crowns and bridges. Both with extreme dimensional accuracy and exceptional surface finish.

• **E-Guard** - A biocompatible transparent material for the production of accurate bite splints and night guards.

• **E-Gum** - developed for use in the creation of flexible gingival masks for use in combination with 3D printed dental models.

> *"We are lucky to be in partnership with EnvisionTEC in this field (Veneers). We believe it will become one of the biggest markets for 3D Printing as well as within dentistry."*
> - Dr. Jin. The Chief Scientist in new material development, Norland

• **E-Guide Tint** - A biocompatible Class I material for the production of high precision surgical drill guides for use in implant surgery.

• **E-IDB** - A material allowing for the production of indirect bonding trays.

• **E-Model** - A tough material that is ideal for the production of dental and orthodontic models.

• **E-Partial** - A castable material developed for the creation of delicate partial frameworks with thin features and some flexibility.

About EnvisionTEC

EnvisionTEC is a leading global provider of professional-grade 3D printing solutions. Founded in 2002 with its pioneering commercial DLP printing technology, EnvisionTEC now sells a range of printer configurations based on six distinct technologies that build objects from digital design files.

The company's premium 3D printers serve a variety of medical, professional and industrial markets, and are valued for precision, surface quality, functionality and speed.

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