

# BEHIND THE SCENES

**W**hen you think about sandblasting images of leftover investment material, dull or roughened surfaces and moulds spring to mind. But sandblasting is much more than this. The more precise a sandblaster operates, the more flexible it is, and one example is Renfert's Basic quattro IS. In this report, the author shows how even occlusal surfaces of IPS e.max CAD crowns in a blue condition can be formed. Sandblasting has become an integral part of the daily lab routine. Removal of flask traces in the casting and pressing techniques may not be feasible without sandblasting. Precise conditioning or

Fig. 2: The Basic quattro IS is robust, ergonomic and easy to use that has a large sandblasting chamber for a clear view.



## Sandblasting Fully Anatomic Lithium Disilicate Crowns with Renfert's Basic quattro IS

by Mr. Oliver Brix

removal of impurities is also the job of a modern sandblasting unit. However, the precise preparation of occlusal surfaces of ceramic crowns through sandblasting is relatively unknown (Fig. 1). Fissures and occlusal morphology can be easily accentuated using a suitable sandblasting unit like the Basic quattro IS with a fine abrasive (Cobra,  $Al_2O_3$ ,  $25\mu m$ ), as well as a fine 0.4 to 0.6mm nozzle (Fig. 2 to 4).



Fig. 1: A monolithic IPS e.max CAD posterior tooth crown after precise sandblasting. All fine anatomical details can be seen clearly.



Fig. 3: Different nozzles (coarse and fine).



Fig. 4: The Cobra abrasive with a grain size of  $25\mu m$  is perfect for working on layered ceramics and monolithic IPS e.max CAD crowns.



Fig. 5: At a pressure of 2 to 3 bar, fissures are tightened with focused blasting, and cusp elements are blasted out. As the abrasive of the quattro IS is dosed very precisely and has no lead and follow-up times, the material can be removed systematically. The special light in the sandblasting chamber (part of Renfert's "PerfectView" system) and the reduced dust development renders a clear view of the object.

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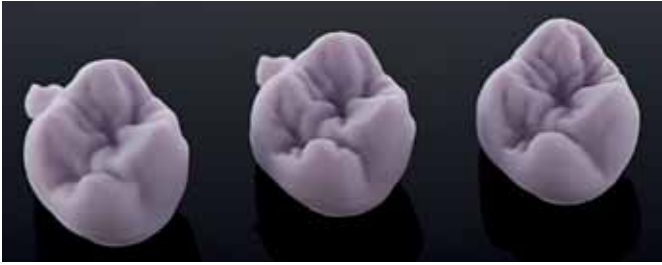


Fig. 6: IPS e.max CAD crowns ground from left to right with a Zenotec mini: Directly from the grinding machine, partly blasted distal parts (the difference can be seen clearly) and a finished contoured crown. The soft transitions and fine cavities show off the possibilities of sandblasting.

We have been applying this process successfully in our lab for several years for veneering ceramics (Fig. 5 to 6).

For successful application of this process, it is important to have a sandblasting unit without any lead and follow-up times that can begin and end the process immediately and precisely. This guarantees that only the surfaces needing treatment come in contact with the sandblaster. The Renfert sandblaster guarantees this with its “Immediate Stop” (IS) functionality.

However, the modification of monolithic IPS e.max CAD crowns (before crystallisation) using sandblasting is a newly differentiated approach. With a little practice, it offers a modern and efficient working process for posterior teeth.



Fig. 11: This photo was taken with a diffuser in order to better highlight the sandblasted crowns.



Fig. 12 & 13: Detailed view: With a little practice, sandblasting is an efficient and simple method to accentuate monolithic IPS e.max CAD crowns.



Fig. 14: The final sandblasted crowns seated in place.



Fig. 7: Seven IPS e.max CAD crowns (HT blanks) ground with the Organical Desktop8. The approximate, centric and eccentric contacts are refinished with a diamond grinder. It is generally recommended to prepare the external form and edges before crystallising.



Fig. 8: The occlusal surfaces are contoured with 0.4 and 0.6mm nozzles at a pressure of 2 to 3 bar. Centric contacts are left mainly unchanged and made smaller or given more clearance if necessary.



Fig. 9: The crystallised IPS e.max CAD crowns as per manufacturer's instructions (Ivoclar Vivadent).



Fig. 10: The finished, colour-accentuated, fully anatomical lithium disilicate crowns after polishing.

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The sandblasting technique described here opens up completely new possibilities to optimise CAD/CAM-based fabrication and functional prosthesis. The fundamental idea is to add missing details to CAD/CAM-fabricated posterior teeth using sandblasting instead of a rotating instrument (Fig. 7 to 14).

The technique introduced distinguishes itself through great rationality and precision. The combination of digital workflow and manual perfection offers a real alternative to the classic manufacturing process. Although a waxed up and pressed monolithic crown continues to be the standard, we still can never tell. **DA**

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## About the Author



**Mr. Oliver Brix** received his dental technician training from 1985 to 1989. Since 1989, Mr. Brix has been working as a dental technician in several laboratories and practices. He specialises in aesthetics and function, all-ceramics, biomechanical occlusal surface design and implantology.

From 1990 to 1998, Mr. Brix participated in various national and international continuing education programmes. He has been freelancing (fixed functional and aesthetic prostheses) for various dental practices since 1994. Furthermore, he has been giving continuing education courses and lectures on ceramics and aesthetics since 1993.

Mr. Brix is an international guest lecturer and consultant for Ivoclar Vivadent AG. He has published several articles on ceramics and aesthetics in national and international trade journals. He has been a member of the Zahntechnischer Arbeitskreis Düsseldorf (Dusseldorf study group of dental technicians) since 1997 and an active member of the DGÄZ (German Association of Aesthetic Dentistry) since 2000. In March 2001, he published the textbook "The Fundamentals of Aesthetics".

Furthermore, Mr. Brix is a member of the editorial board of AACD since 2007. He opened the International Training Centre in 2009 and the dental practice "Innovative Dental Design Oliver Brix" in Bad Homburg, Germany in 2012. In March 2013, he published the textbook "Fascination Ceramics".