VITA ENAMIC: a greater similarity to natural dentition and more cost-effective than previous CAD/CAM ceramics?

By Dr. Otmar Rauscher

The hybrid ceramic VITA ENAMIC is an innovative CAD/CAM material. Using a clinical case as an example, this report explains how VITA ENAMIC offers commercial benefits in comparison with similar materials. The time required to complete processing and the service life of milling tools are criteria that are worth looking at from an economic perspective.

New structure, new possibilities

The innovative hybrid ceramic, which is comprised of a structure-sintered ceramic matrix, together with an integrated polymer network, offers abrasion behavior similar to enamel as well as a modulus of elasticity of 30 GPa, which is similar to that of dentin. The hybrid ceramic demonstrates unusual properties thanks to a combination of flexiblity and load capacity. For example, the static fracture load is approx. 2800 newtons while the Weibull modulus, an indication of material reliability, is 20. As a result, VITA ENAMIC is recommended as a CAD/CAM material particularly in the case of minimally-invasive restorations and in areas subject to high occlusal load. Even inlays with a wall thickness of just 0.2 mm can be reliably implemented.

During processing, the hybrid ceramic also demonstrates high edge stability in the case of restorations with thin margins. This stability combined with integrated cracking prevention allows milling to be performed in fast milling mode even if walls are thin. Thanks to the short milling time and long service life in the case of milling tools, VITA ENAMIC is an interesting option from an economic standpoint. No firing is required either.

Case study

In a 50-year-old patient, tooth 45 had been fitted with an inadequate acrylic filling and also showed secondary caries (Fig. 1). The goal of treatment was to provide a new minimally-invasive restoration using an inlay. VITA ENAMIC was selected as the material, providing rapid chairside fabrication in combination with CEREC MC XL (Sirona). Shade 2M2 powder was then applied, followed by scanning of the prepared tooth and the antagonist. The digital processing of the model was carried out using CEREC SW 4.03. Once the new case had been created (Fig. 4), VITA ENAMIC was selected in the program as the material (Fig. 5). Using the digital impression data of the preparation, antagonists and maximum intercuspation, digital models were created (Fig. 6 to 8). The software also generated buccal bite registration (Fig. 9 and 10). Figure 11 shows the occlusal contacts. In the next step, concrete planning of the new inlay began with the definition of the preparation margin (Fig. 12). When determining the modeling parameters, using the “Minimal Thickness (Radial)” setting (Fig. 15) allowed margins to be delicately adapted so that one of the special properties of VITA ENAMIC could be used to full effect. A software-generated model was then suggested for the inlay (Fig. 14). Following slight adjustment of the design, the block was selected (Fig. 15) and the milling preview displayed (Fig. 16). Fabrication was performed using CEREC MC XL. The processing time for an inlay using normal milling mode is just under eight minutes; in fast milling mode, approximately four-and-a-half minutes. Tests conducted by the manufacturer show that a longer service life can be achieved: using one set of milling tools, it was possible to fabricate 148 posterior crowns in normal milling mode and 152 posterior crowns in fast milling mode. Initial practice experience confirms this trend.

The fact that no firing is required at all also saves time. The VITA ENAMIC STAINS KIT (six stains including accessory) can be used for shade characterization. The stains are bonded to the restoration as part of a polymerization process and surface sealing can be performed using the chemical glaze material VITA ENAMIC GLAZE. Try-in was carried out for the inlay followed by adhesive bonding using VITA Duo Cement. Final polishing was performed for one minute in each case using the VITA ENAMIC Polishing Set clinical and siliccon carbide polishing instruments, and was followed by high-gloss polishing using gray diamond burs. The final results blend in perfectly with the remaining natural dentition (Fig. 17).

Summary

VITA ENAMIC is a material that is convincing, not only because of its properties similar to those of natural dentition, but also because of its outstanding efficiency thanks to ideal processing characteristics, which has been proven in practice. The hybrid ceramic helps save you both time and money in a range of steps. The patient also benefits from shorter treatment times – as well as from superior quality results that offer properties similar to natural dentition in terms of look, feel and functionality.

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Dr. Otmar Rauscher 1991: Doctorate degree awarded by the University of Munich, Germany
Since 1992: Own dental practice in Munich, Germany
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