Material Selection for the CAD/CAM Fabrication of Aesthetic Restorations

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In today’s aesthetic practice, clinicians can select from various materials and techniques to provide optimal restorative care. Due to the function, aesthetics (ie, shade, luster, light reflection and refraction), and longevity of ceramic restorations, they represent a proven option for clinicians seeking to deliver the highest level of care for their patients. The CAD/CAM method of fabricating ceramic restorations enables more durable aesthetic materials (leucite-based, zirconia-based, alumina-based, etc) to be used in the definitive inlay/onlay, crown, or bridge. Selecting among the appropriate ceramic materials and restorative techniques is thus critical to the success of the proposed treatment plan.

† CEREC 3D is a registered trademark of Sirona Dental Systems, Charlotte, NC.

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The CEREC 3D system supports a range of material options and enables the user to deliver aesthetic inlays/onlays, crowns, and veneers in a single patient visit. The flexibility of the system can be particularly advantageous when patients require minimally invasive, durable all-ceramic restorations of varying indications. When selecting a ceramic material such as a VITA TriLuxe Bloc for the CEREC 3D, the clinician must consider numerous requirements:

- The ability of the material to replicate natural light dynamics
- Occlusal stresses anticipated for the restoration
- Optical characteristics (eg, fluorescence, translucency, hue, chroma, value) of the milled ceramic block
- Proven durability of the fine-particle feldspar block
- Enamel wear characteristics

**FIGURE 5.** To obtain a suitable optical impression for the CEREC 3D system, titanium dioxide spray was applied to the arch, and the image was recorded.

**FIGURE 6.** The design tools of the in-office CAD/CAM system enabled the virtual die of the quadrant to be refined.

**FIGURE 7.** Beginning with the first premolar, margins are outlined for restoration design.

**FIGURE 8A.** Occlusal view of the completed restoration design. **8B.** Virtual onlay ready for milling from a VITA TriLuxe bloc of ceramic.

‡ VITA TriLuxe block, Vident, Brea, CA.
**Single-Visit Aesthetic Restorations**

Using CEREC 3D, quadrant dentistry can be performed with success and predictability in a single patient visit. The involved CAD/CAM process enables the operator to design the intended restoration as well as its occlusal contacts from an expansive database and clinical record for ideal tooth morphology, thus ensuring an accurate prosthetic result upon milling of the ceramic block. Benefits of this restorative approach include the following:

- Precise-fitting restorations
- Simple CAD process performed chairside
- Increased practice profitability
- Predictable tooth morphology
- Refined occlusal contact control
- Aesthetics and seamless integration with natural teeth

**FIGURE 9**. After milling of the VITA TriLuxe restorations, they were custom stained and glazed to achieve aesthetic expectations.

**FIGURE 10**. Try-in of the ceramic restorations prior to seating. Note the accuracy of the dry restoration fit.

**FIGURE 11**. A gingival retraction paste was used to achieve proper tissue control for restoration bonding.

**FIGURE 12**. Occlusal view of the definitive metal-free restorations at 1 week demonstrates the integration and aesthetics throughout the quadrant.
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