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POLYJET

Researchers develop novel hybrid workflow to create patient-specific, full-color dental restorations.

New developments in digital workflows have opened the door to unprecedented accuracy in dental restorations. Conventional ceramic press manufacturing is still the gold standard for producing resilient and aesthetically accurate restorations. Combined with the use of intraoral scanners, digital dentistry can now provide accurate recording of color, surface, and tooth structure for use in 3D printed models of the patient's mouth. The data from these scanners can be used to produce the most accurate crowns and bridges for a patient's esthetic treatment.

Researchers have demonstrated that dental laboratories can achieve high realism for precision dental esthetics by combining a digital technology workflow that includes color matching data, pressed restorations, and PolyJet 3D printing technology.

3D Surface Data

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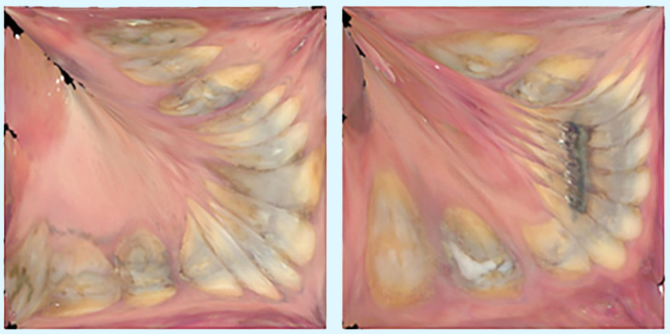


Color Information

Maxilla **Mandible**

=

3D scans with geometry-related color information

Combining techniques to improve patient care.

In 2022, the Journal of Esthetic and Restorative Dentistry published a paper on a new digital workflow that uses conventional press ceramic techniques for producing crown and bridge restorations, alongside 3D-printing technology used to create full-color dental models . This hybrid workflow allows for the best possible outcomes in terms of restoration longevity and color accuracy to the patient's natural tooth color.

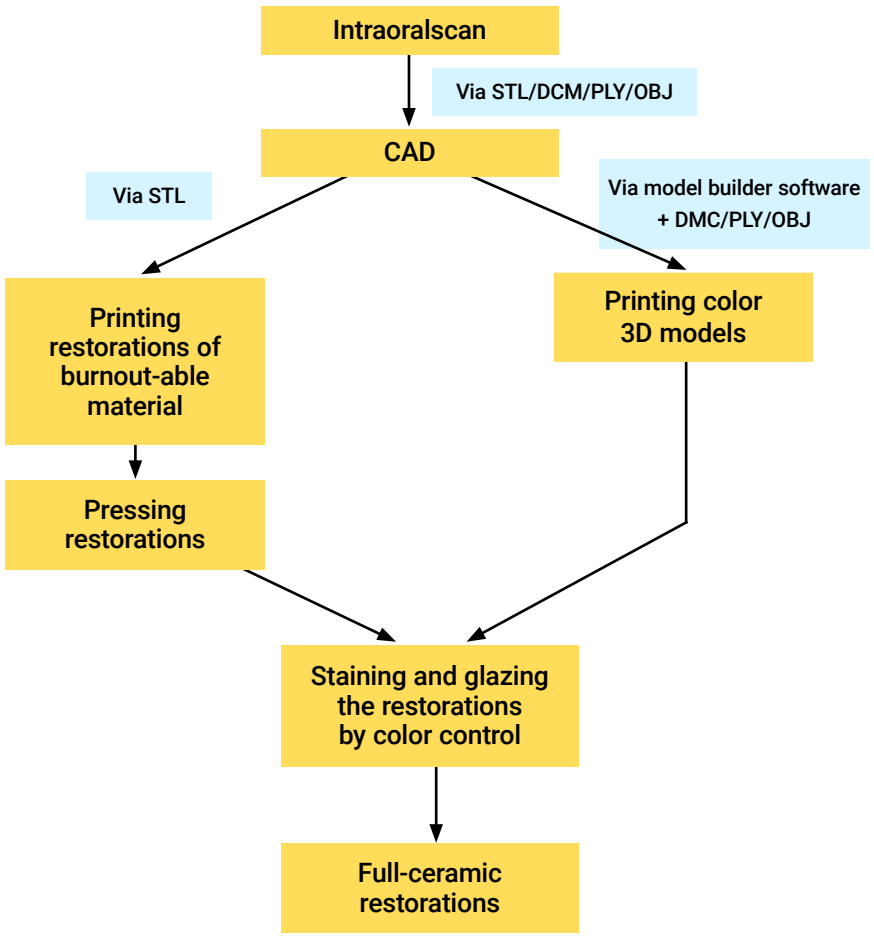
The Process

Researchers used an intraoral scan of a patient's mouth as the basis for creating both a dental restoration and model. 3Shape software was used to generate a virtual version of a colored model, which was used to 3D print a colored model using Stratasys PolyJet technology. PolyJet printed allows for printing of up to 500,000 colors with a glossy finish for the most accurate representation of the patient's mouth.

The pressed restorations were produced using the same digital data from the intraoral scan and stained and glazed to closely match the color from the 3D printed model.

The Results

This novel hybrid workflow was shown to reduce the risk of re-dos due to color misfit between the patient's teeth and the restoration.



Gain full-color capabilities with Stratasys 3D printing solutions.

Stratasys offers 3D printing solutions that allow dental labs to create accurate, reliable dental models more quickly than with ceramic pressing technology.

The Stratasys J5 DentaJet, our high-efficiency smaller footprint PolyJet technology printer, is capable of printing full color models and multi-material mixed trays. J5 DentaJet users can produce more dental parts and dental models with less handling.

References

Schweiger, Josef et al. Application of 3D-printed colored 3D models for the fabrication of full ceramic restorations: A technical report. Journal of Esthetic and Restorative Dentistry 34, 1 (2022).
https://doi.org/10.1111/jerd.12873.

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