

## QUIZ

1/2 point CDT  
documented  
scientific credit.  
See Page 37

# Great Results, Firing After Firing

By Frank Haeuser, CDT

As a dental ceramist, the trial of new or unfamiliar ceramic materials can be a time-consuming activity. Often, we do not have the luxury of testing on practice cases, so the pressure can mount as one ventures into unfamiliar territory, with a final expectation and deadline close on the horizon. It can be an overwhelming feeling when you realize that every failure affects your reputation. It is for this reason that when we find a ceramic veneering material that produces reliable results, we stray from it with great hesitation (**Figure 1**).

### QUICK TAKE

Frank Haeuser, CDT, took on what he sees as a game-changing material when he tried out InSync ZR, a new ceramic system from Jensen Dental.



Figure 1



Figure 2

Leaving the comfort zone is no small task. A great deal of time can be spent calibrating the firing parameters for five or more different programs in our furnace. Furthermore, the familiarization with the powders and what they end up looking like, and how they behave visually under different lighting conditions is not something that happens in just a couple of days. That said, I feel that it is very important to give new materials a chance because you never know when you may stumble upon a game changer for yourself and for your laboratory.

Things that I consider to be game changers are the ease of handling, the faithful reproduction of targeted shades, the ability to mimic natural dentition and the overall thought that has been given to the way a ceramic system is set up. I recently had the opportunity to try out InSync Zr, a new ceramic system from Jensen Dental. The goal of this system is to use one ceramic kit to veneer zirconia and titanium frameworks. Systems like this that have multiple indication and, therefore, can reduce inventory are very attractive.

The InSync Zr ceramic system is optimized to Lava™ Plus and Jensen HT Zirconia when shaded with their corresponding shading liquids. The simple two powder build up results in an excellent shade match to the VITA™ Classic A1-D4 shades.



Figure 3

InSync Zr is an ideal ceramic for layered zirconia copings, press to zirconia, as well as staining/glazing full contour restorations. What I've found is that with InSync Zr, technicians have a simple and easy zirconia layering process. Here is the process I use to achieve beautiful results and shade fidelity every time.

First, the liner is applied to a Lava™ A1 substructure (Figure 2). The liner No. 1 was used and the fired result is shown below next to the target shade tab of A1 (Figure 3). This was the very first crown that I veneered with the InSync ceramic and, as you can see, we are off to a good start.

The opaque dentin is used sparingly and is only needed to break up the outline of the buccal and lingual cusp areas (Figure 4). Then, the restoration is covered with A1 dentin (Figure 5). A thin wash of clear enamel is added to mimic the dentin enamel junction (Figures 6 and 7). The blue material is the enamel 57.

A slight amount of A1 dentin is added to the outside borders of the occlusal table (Figures 8-10). This is done to prevent value loss from the translucent incisals, especially when that clear layer is sandwiched between the dentin and the outer enamels. The fired result is compared to the shade tab (Figure 11). The crown is adjusted to the model and glazed up with the provided overglaze (Figure 12). The final result looks great to the A1 tab with minimal effort and surface staining (Figures 13-14).

The light transmittance when illuminated by an internal light source shows how light is able to move freely throughout the restoration (Figure 15). It is important to note how the use of the liner can affect the shade of the coping without inhibiting the translucency found within the Lava™ coping.

The result was more than just a good one. This case clearly shows the efficiency and the predictability of the system in a production setting



Figure 4



Figure 5



Figure 6



Figure 7

Figure 8



Figure 9



Figure 10

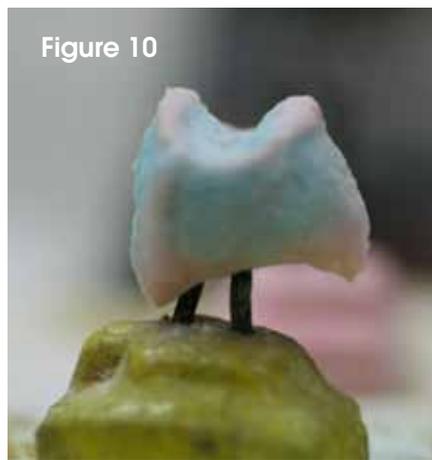


Figure 11



Figure 13



Figure 12



(Figures 16-17). I have to stress the fact that this was the very first case I fabricated with InSync Zr. I have since completed at least 20 single posterior restorations, all of which resulted in better than average restorations.

However, the question must be asked: Is InSync Zr just a production ceramic or does it have the potential for truly custom work and the real life challenging applications that we are faced with on a daily basis? I decided to put it to the test against a single central restoration for a patient that presented for a custom shade. This was the sort of case that was going to push the limits and prove or disprove that the ceramic has the potential to behave reliably in a multiple-firing situation. With, at this point, less than two dozen posterior units under my belt, I knew that it would take some work to get it done.

The patient presented to the laboratory for a custom shade, and three tabs seemed to be the closest (Figure 18). The one on the far left was the Vita 3D Master 1m1.5 and the two on the right were from the Dentsply Esthetex shade guide. None of these shades are exactly equivalent to the InSync powders, but they do approximate the Vita A1. Note how the final restoration will have to be in a more labial version.

The Lava™ FS-1 coping was lined with the liner No. 1 (Figure 19). The coping was fired and the surface was further characterized with stains. It was then dipped into the clear enamel powder and fired at 10°C higher than the body bake (Figure 20). This serves as an additional wash firing.

The mammelon area was built up with A1 opaque dentin (Figure 21). The cervical area was covered with a mixture of A2 dentin and clear enamel (Figure 22). This was done to increase the color saturation near the gingival and to allow for better light absorption at this thin and often problematic zone.

The whole facial and lingual are then covered with A1 dentin, and Opal 30 is added to the middle third (Figure 23). The incisal third is developed by a segmental build-up of A1 opaque dentin and Opal 30 (Figure 24).

A small layer of clear enamel is added to the incisal third and it is completely covered by the Enamel 57 (Figure 25). The lingual aspect is further defined in the cingulum and marginal ridge areas by adding Opal 30 (Figure 26).

The contour is finalized with an incisal edge layer of A1 dentin to give it a nice halo and to frame

Figure 14



Figure 15

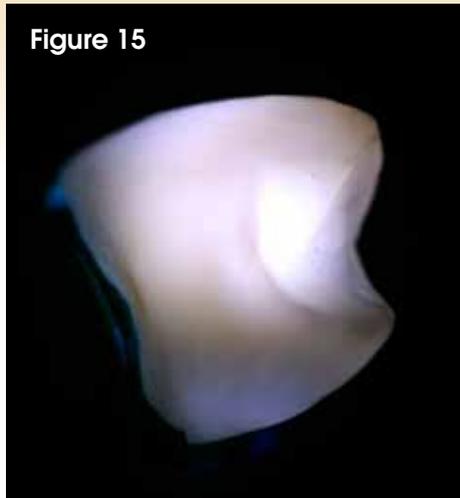


Figure 16

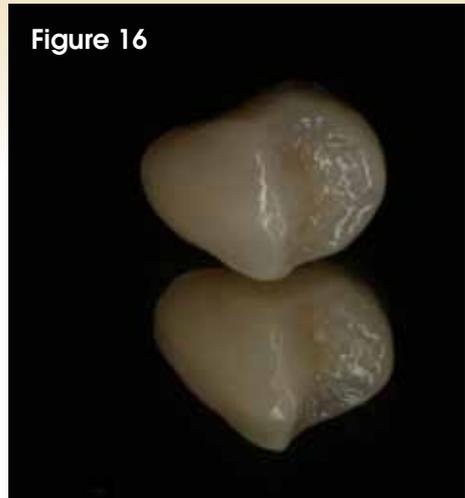


Figure 17



Figure 18



Figure 19



Figure 20



up the translucency to in order to prevent a value drop off at the incisal edge (Figure 27). The fired restoration is shown to the right still on the firing peg (Figure 28).

The proximal contacts are adjusted as well as the lingual occlusion (Figure 29). The contour is developed by mapping the main anatomical features and by noting some of the plane changes (Figure 30). The surface texture is analyzed by rubbing red articulating paper over the surface of the restoration and the adjacent teeth on the cast (Figure 31). Then, the restoration is cleaned and glazed (Figure

32). It is checked to the main target shade tab and it appears to be a good match (Figure 33).

I have been experimenting with virtual try-ins for the last couple years and decided to put this restoration to the test. The try in was conducted by cropping in a photograph of the restoration on the model to the initial custom shade photograph (Figure 34). This virtual try-in tells me that the restoration is too low in value and has too much translucency in the incisal third. Some external stains are added to decrease the translucency in the incisal third. The result looks better, but it still is

Figure 21



Figure 22



Figure 23



Figure 24



Figure 25

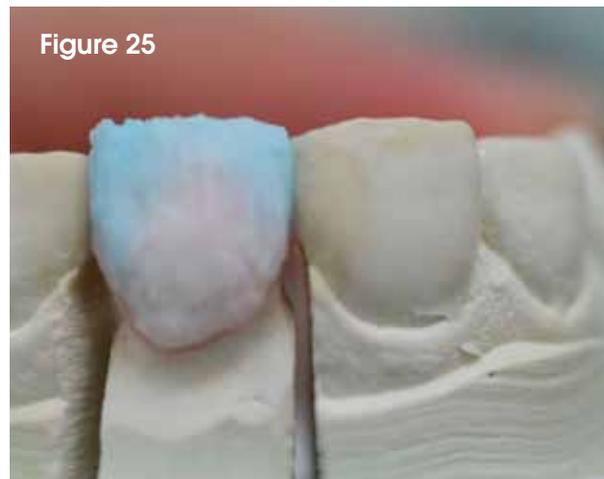


Figure 26



Figure 27



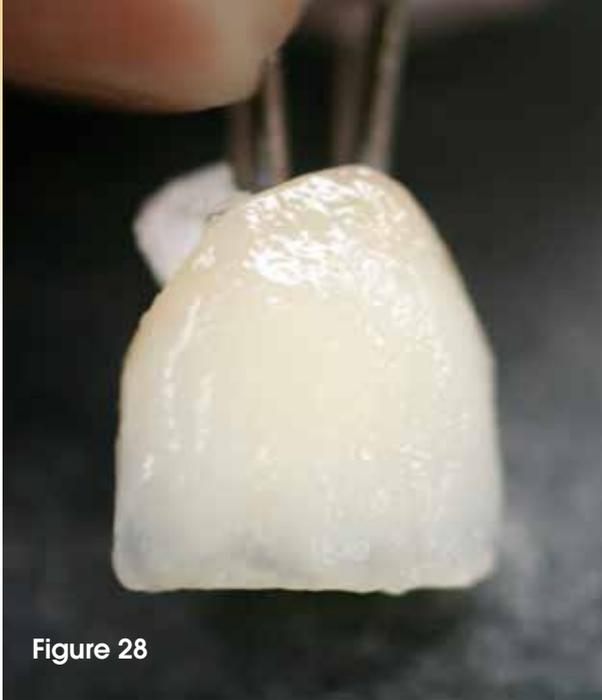


Figure 28

not satisfactory. The restoration is fired again, but the surface stain is becoming too blotchy. I am questioning the quality of this restoration and decide to cut back the ceramic and re-layer a good portion of it.

A slight cut back is carried out on the facial of the restoration and some white stain is fired to the surface to mask out some of the translucency (Figure 35). Opaque dentin is added to build up even more prominent mammelon structures (Figure 36). A1 body is added to the facial to soften the opaque dentin mammelon structures and the incisal contour is finalized by segments of Opal 30, and Enamel 57 (Figure 37). A halo is added using a mixture of A1 dentin and opaque dentin (Figure 38). The fired restoration shows better value than before, but it still needs to be contoured and glazed before I can have a better idea (Figure 39).

Once again the restoration is adjusted to the cast and contoured as it was before (Figures 40-41). Note the continued labial positioning of the restoration due to the position of the underlying preparation.

The glazed restoration was virtually tried in with much better results. There is now little or no surface stain and the shade will now be of a higher quality as it comes from within. The final restoration was not perfect, partly due to my application of too much surface texture and a slightly low value, but the patient and the dentist were satisfied (Figures 42-43).

That case was not used to point out inadequacies in the ceramic, but rather to



Figure 29



Figure 30



Figure 31



Figure 33



Figure 32



Figure 34



Figure 35



Figure 36



Figure 37

point out how it can withstand a great deal of manipulation and undergo a great number of firings with the final result being a good one.

The InSync Zr ceramic system is optimized for Lava™ Plus and Jensen HT and delivers natural fluorescence, creating a more lifelike restoration. There is a high degree of shade consistency delivered with a simple two powder dentin and enamel build up. As you can see from the second case, the system holds up under multiple firings. Bottom line: InSync Zr is one ceramic system for anterior and posterior restorations that will reduce your inventory while maintaining your quality standards.

I am constantly trying to learn better techniques and trying to find good ways of checking and verifying my work. Unfortunately, a part of this rigorous verification is the need for the constant altering of the ceramic restorations until it has passed my tests. The InSync Zr ceramic stood up well in both production and more customized situations. I would highly recommend it to anyone who is searching for a veneering ceramic for zirconia restorations.

**Author Acknowledgement**

I have presented these cases as my work, but really they are the work of a great number of technicians at Nu-Art Dental Laboratory, CDL, who worked on the models and designed the substructures so that I could concentrate on layering and finishing the ceramic process. **JDT**

**About the Author**

Haeuser graduated from the University of Wisconsin - Milwaukee with a bachelors degree in fine art. He has spent the last decade working as a ceramist at Nu-Art Dental in Wauwatosa Wis. Haeuser is one of three co-owners of Nu-Art Dental Inc. His proudest achievement however is being a husband and a father to three wonderful children.



Figure 38



Figure 39



Figure 40



Figure 41



Figure 42



Figure 43



**QUIZ:**

Receive .5 point documented scientific credit for passing a quiz about this article. To get the quiz go to *JDT Unbound* ([www.jdtunbound.com](http://www.jdtunbound.com)) and click on the CDT link. You can enter your answers to this quiz (course code #28295 at [www.nadl.org/members/JDT/quizzes/index.cfm](http://www.nadl.org/members/JDT/quizzes/index.cfm) or fax the completed quiz to (850) 222-0053. This quiz is provided to test the technician's comprehension of the article's content and does not necessarily serve as an endorsement of the content by NADL or NBC.

