

The Art of Custom Shade Matching a **Central Tooth**

Introduction

Technicians will have struggles with single tooth matching, especially when it is a central tooth. But if we can follow certain rules and procedures, we are able to handle the differences and make the restoration match almost perfectly every time. For instance, opacity vs. translucency, high value vs. low value, characteristics for final stain effect – all of these considerations will play a role in the appearance of the restoration. We can discuss many things when it comes to single central teeth but the author would like to discuss the color/characteristic matching in our three patient case studies, as noted here.



Figure 1
Case one, author fabricated ceramic custom shade tabs with high chroma A3 bases with crack lines and deep translucency



Figure 2
Multi-layering technique

Patient number one had numerous crack lines and heavy translucency. The author would like to share his final stain technique after his multi-layering build up regarding patient two and when discussing patient number three, he will highlight the case's complications with high transparency and how he handled that aspect of the work.

Case Studies

The author recorded a custom shade for patient one (**Fig. 1**), central number 9, using multiple custom made porcelain shade tabs. During the appointment, he focused on the gingival color and crack lines and how much enamel was present in the patient's dentition.

In the lab, when fabricating the restoration, he applied an A3 base and Translucency Modifier 05 from GC Initial to the middle section of the restoration (**Fig. 2**). Using Translucency Neutral and Cervical Translucency 24, mamelon was carefully created, after which vertical crack lines were produced using a white staining material. After porcelain bake, he created the surface texture

both vertically and horizontally with a carbide burr (Fig. 3), mimicking the adjacent teeth. High fusing porcelain from GC Initial, using the platinum foil technique, was chosen for the restoration.

During the try-in the mouth stage, the restoration was checked for balance and harmony of color (Fig. 4) from the gingival to the incisal area. In a right-side view, readers please note the deep translucency in the mesial/distal area, along with the distinct crack lines (Fig. 5). In this protrusion view, (Fig. 6), please note the surface texture and the identical convex/concave and matching color with central number 8. The case had a successful outcome.



In our second case study, we have an image of the provisional number 8 in the mouth (Fig. 7), which mimics number 9. The gingival 1/3 area has high opacity and different coloration. The middle area has some translucency and color variations of orange, blue, tan and grey.

The author followed what he saw and duplicated it when applying the porcelain build-up and layering, depicted here in (Fig. 8). After trying the crown in the mouth, some modifications still needed to be added. Hydration helped to see better what needed



Figure 3
After porcelain
bake, surface texture

Figure 4
Try-in, color check

Figure 5
Right side view

Figure 6
Protrusion view

Figure 7
Case two,
provisional #8

Figure 8
Follow custom
shade record to layer
porcelain



Figure 9

After try-in, modifications still needed



Figure 10

Create more vertical crack lines

Figure 11

Create grey lines

Figure 12

Complete – immediate shot



Figure 13

Case three, author fabricated ceramic custom shade tabs with dentin enamel with translucency

Figure 14

Dark prep

to be done (Fig. 9). He worked on creating a bit more of a vertical crack line with the restoration in the mouth (Fig. 10) and grey lines between the white crack lines (Fig. 11). Upon completion, an immediate shot was taken of the pleased patient, hydrated (Fig. 12) and shown here.

Our third case study involves a complicated shade match with translucency, transparency and multiple mamelon colors with transparency and a lot of modification (Fig. 13). The gingival margin area had subtle orange color with white calcification and brown staining in between the teeth. The author also noted a grey band in the middle area of the dentition which would be mimicked as well.

As we can see in this image (Fig. 14), the prepped tooth is dark and the color difficult to mask. The author used a zirconia coping from Amann Girrbach, milled with the Motion Mill 2 machine, in order to assure maximum coverage of that area when the crown was cemented. During the try-in stage, a note was taken regarding the imitation of



the white calcification for the gingival area and the white, tan and grey crack lines for the incisal 1/3. The translucency application and the irregular and subtle crack lines were also noted. The author felt his efforts were successful in matching the patient's natural dentition and she was in agreement.

Upon the final try-in stage (Fig. 15) the middle area of the restoration appeared to be slightly darker because of the stump color. He recommended white cement to the dentist for masking purposes and often does in situations such as this one. Fig. 16 is the immediate shot after try-in with the finished restoration.

Conclusion

As the reader can see, in the above three cases the colors and characteristics of these patients' teeth would not be found in a traditional shade tab. Most technicians, unfortunately, learn their shade matching instruction from working with such a system but in truth the author considers those shade tabs to be opposite from nature. They are high in value and natural teeth are low in value. Furthermore, they do not provide a way to illustrate modifications necessary to mimic natural teeth.

The truest test for technicians, in the author's opinion, is to simply see as many patients as they can in order to learn and recognize what looks best in the mouth. If a technician learns to utilize the best material options, they will be a great technician. Regardless of digital technology and how it continues to take over our industry, there will always be a demand for natural restorations. Patients recognize the difference and they want to look their best. If we learn how to give them that promise and deliver, we are in business! **JDT**



Figure 15
Try-in stage



Figure 16
Second try-in,
final shot

About the Author

Luke S. Kahng, CDT, specializes in high-end ceramic restorations and has served on several major dental journal boards as a contributing member. He invented the Chairside Shade Guide and then expanded the offering to a unique ceramic shade guide system named the Seasons of Life Selection. Kahng is owner and president of LSK121 Oral Prosthetics, one of the largest dental laboratories in the country, located in Naperville, Ill. He has published over 100 articles in major national dental publications and authored several books.



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