

Procera Alumina vs. Feldspathic Porcelain

# How to Achieve Shade Harmony With Different Restorations

Luke S. Kahng, CDT



Restorations made of different ceramic layering materials or made on different cores, exhibit unique optical properties that are difficult to harmonize. However, a growing demand for all-ceramic restorations more frequently places the technician in situations that require such harmonization. In this article, our author demonstrates the materials and techniques required to blend restorations made of different ceramic materials.

**Key Words:**  
**Stump shade,**  
**Feldspathic**  
**Porcelain,**  
**Zirconia,**  
**Alumina,**  
**LSK Treatment**  
**Plan Wax-Up,**  
**Esthetic**  
**Harmony**

Today most patients prefer not to see any metal around a restoration and are well aware that they have restorative choices to keep metals out of the mouth. For the professional, there are many choices for all-ceramic restorations including feldspathic porcelain, pressed ceramics, composites, and others. Decisions as to which restoration is best can only be made by looking at the shade of the prepared teeth. If the underlying preparation color is dark (i.e., between A5-C10), then opacious core materials such as zirconia or opacious pressable materials are required to mask the underlying dark color. If the underlying tooth color falls between the Classic Vita shade colors of A1 to D4, alumina or porcelain veneers are

recommended. However, skillful technicians can mask the underlying tooth color with porcelain veneers by using detailed color masking techniques combined with the proper preparations (i.e., deep shoulder preps for pressable materials, deep chamfer preps for zirconium, alumina, and porcelain veneers).

It is also often necessary to combine restorations and materials to obtain the desired appearance and functional compatibility.



Fig. 1. Preoperative facial view. #8 is a porcelain to metal crown. #9 changed shade due to the bleaching.



Fig. 2. Preparations: A full crown on #8 with a rounded shoulder margin for a Procera alumina restoration and porcelain veneers for 7, 9, & 10. The proximal contact between 8 and 9 is 5mm from incisal of prep on 8.



Fig. 3. Stump shade for 9 is shade A4 and will need to be masked out toward gingival third.



Fig. 4. The stump shade for lateral incisors 7, 10 is A2. This is much lighter than 9. This must be considered when selecting materials and colors for the restorations.

#### CASE OBJECTIVES and PRESENTATION:

The 58-year-old male patient had inflamed tissue around the anterior teeth. Tooth #8 had a porcelain to metal restoration with extreme tissue irritation caused by the margin impinging on the biologic width, especially on the mesial. After consultation, he was referred to a periodontist for evaluation. The treatment plan called for crown lengthening for #8 and esthetic recontouring of the maxillary anterior gingival architecture. After surgery, the patient's prosthetic choices could be evaluated. Impressions were made of the existing situation and a LSK Treatment Plan Wax-Up was done on the maxillary anteriors. The LSK Treatment plan wax-up increases case acceptance and promotes the best outcome. It also establishes occlusion, centric stops, phonetics, smile line and esthetics. Finally, it is a blueprint for the definitive restorations and gives the patient a natural looking, esthetic 3D model while serving as a powerful communication tool for everyone involved.

The wax-up showed that teeth 7, 9, and 10 could be restored with porcelain veneers while an all-ceramic crown was needed on #8. Before restoration began, the teeth were bleached with a take home whitening kit. After two weeks, the bleaching was completed and the selected teeth were prepared. Following tooth preparation, photos of the prepared teeth with shade tabs in view were taken. Finally, an additional impression was made of the completed temporaries to communicate the desired outcome to the laboratory.

Following fabrication by the laboratory, the final restorations were tried in for fit, contour, and shade. After seating the restorations with resin cement, the occlusion was evaluated and adjusted as needed. An alginate impression was then made of the maxillary arch and a new bleaching tray was fabricated so the patient could maintain the shade with intermittent bleaching. The patient was instructed that regular office recalls were necessary for evaluating and maintaining overall health. dental dialogue

***“The LSK Treatment plan wax-up increases case acceptance and promotes the best outcome.”***



*Fig. 5. Lingual view of the LSK treatment plan wax-up showing natural lingual morphology. Notice definitive centric stop and natural tooth form.*



*Fig. 6. Facial view of the LSK treatment plan wax-up shows shape of teeth.*



*Fig. 7. LSK treatment plan wax up is used for temporization and to establish proper emergence profile and incisal guidance.*



*Fig. 8. After making a clear vacuum formed stent of the duplicate model of the LSK treatment plan wax-up, the temporaries are made and the shape refined in accordance to patient preferences. A Bisacrylic shade A1 material was used.*



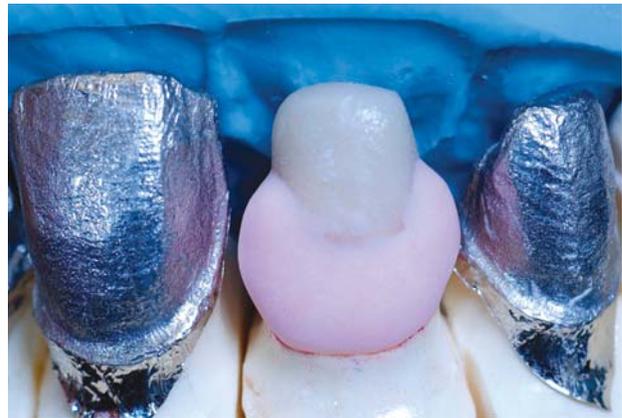
*Fig. 9. Facial view of temporaries, following adjustments to establish correct lip support, midline and incisal guidance.*



*Fig. 10. An index is made with silicone to help establish incisal guidance and width during fabrication.*



*Fig. 11. View looking down the incisal to make sure there is adequate room facially for the porcelain build up.*



*Fig. 12. Porcelain build-up of the Procera alumina coping. GC Initial AL porcelain is used starting with Inside powder. The Inside powder is a special primary dentin with fluorescence and highly chromatic dentin colors. It is used at the cervical area to give the appearance of depth.*



*Fig. 13. Dentin powder gives the crown optimal chroma using the cutback technique.*



*Fig. 14. A Cervical translucent ads depth in the cervical third.*



Fig. 15. Translucent Modifiers are applied.



Fig. 16. Enamel Effect applied to the incisal area simulates the natural appearance that is missing from crowns made with a single enamel shade.



Fig. 17. A thin layer of Clear Fluorescence powder is applied. The CLF is used as a thin layer between the dentin layer and enamels on top of it. This is the so-called "transparent dentin" and brings true-to-nature depth into the tooth color. Enamel Opal powder is applied, which has a higher level of opalescence in conjunction with high translucency.



Fig. 18. The crown after the first bake.



Fig. 19. A lateral view of the veneer build-up using GC Initial MC porcelain. The colors shade tabs are the same Inside and Dentin colors used on the crown.



Fig. 20. Enamel Effect powders and a base of Fluo Dentin porcelain is applied. Fluo Dentin is used instead of opacious dentin. Fluo Dentin is a highly fluorescence porcelain in dentin colors.



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*Fig. 21. A thin layer of Clear Fluorescence powder is applied and then Enamel Opal powder is applied.*



*Fig. 22. Translucent Modifiers are applied.*



*Fig. 23. A layer of the desired Enamel powder is applied.*



*Fig. 24. View of fired segmental layers.*



*Fig. 25. View of the finished restorations on master cast, Porcelain veneers for #7, 9, and 10 and Procera Alumina for #8.*



*Fig. 26. Internal view of restorations.*

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Fig. 27. In contrast to the crown, the veneers will appear too transparent and lighter in shade. By placing the veneers over the shaded stump (the same the doctor took in the mouth) we can verify the veneers will match the #8 alumina crown upon cementation.



Fig. 28. Stump shade placed underneath transparent veneer #7,10 to verify shade will match #8 alumina crown upon cementation.



Figs. 29-30. A lateral views of the patient showing the harmony of the lateral and centrals.



Fig. 31. Intraoral view of cemented restorations 7, 9, and 10 are feldspathic veneers made with GC Initial MC Porcelain. #8 is a Procera Alumina coping layered with GC Initial AL porcelain. With this technique it was possible to create optical harmony between all materials.

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**Bio:**

Luke S. Kahng, CDT, is the founder and owner of Capital Dental Technology Laboratory, Inc. of Naperville, Illinois. Mr. Kahng's laboratory specializes in all fixed restorations. Its division, LSK 121, provides highly personalized custom cosmetic work.

Mr. Kahng developed the LSK Treatment Plan that focuses upon a biomechanical design of occlusal surfaces for reconstructive and esthetic dentistry. He has also developed a series of shade conversion tables for porcelain. A strong proponent of collaborative dentistry, Mr. Kahng stresses education, communication and the team approach to patient care.

Mr. Kahng is a clinician for G.C. America, Bisco, Captex and others. He is a frequent lecturer and program facilitator for dentists and dental technicians, and he contributes to various dental journals regularly, including Dental Dialogue, Practical Procedures and Esthetic Dentistry, and Contemporary Esthetics. He is Master Ceramist. His training has included extensive study with Russell DeVreugd, CDT, Dr. Frank Spear, Dr. Peter Dawson, and Oral Design Team members. Currently he is a member of American Academy of Cosmetic Dentistry.

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