GC get connected 4

Your product and innovation update

2015

Get Connected,
Together towards
the best solutions
for your patients.

essentia

The smart simplification of a composite system!

Javier Tapia Guadix, DDS, CG Artist

Leonardo da Vinci said that simplicity is the ultimate way of sophistication. When it comes to developing an aesthetic dental composite material, we tend to overcomplicate things, caused either by old recurring concepts, by industry competitiveness or by wrong analysis of nature observation. However, ultimate simplification is possible when we jump across these problems and start from scratch. Developed within the GC Europe Restorative Advisory Board, Essentia represents the minimalism inside the composite world, a simplified system that enables an easy but effective aesthetic restoration with a very limited amount of shades. The complete kit, with just 7 shades and 4 modifiers, becomes a paradigm shift in layering composites.

The classic concept of a composite material with a big variety of hues and chroma within its range is starting to become obsolete. The actual tendency is to have a unique hue but still with a big range of chroma options. We took the simplification further to create a new approach with only three dentins and two enamels as a base.

Regarding teeth, the base color (hue, value and chroma) is mainly given by dentin, followed by a modulation of value by enamel. Value is also determined by the opacity of a translucent material, opaque materials have a higher value, while translucent materials have a lower value. It is known that matching hue and chroma is not as important for a successful restoration as matching value.

Using the same base opacity for all dentin shades in a system can generate problems as younger teeth have very little chroma

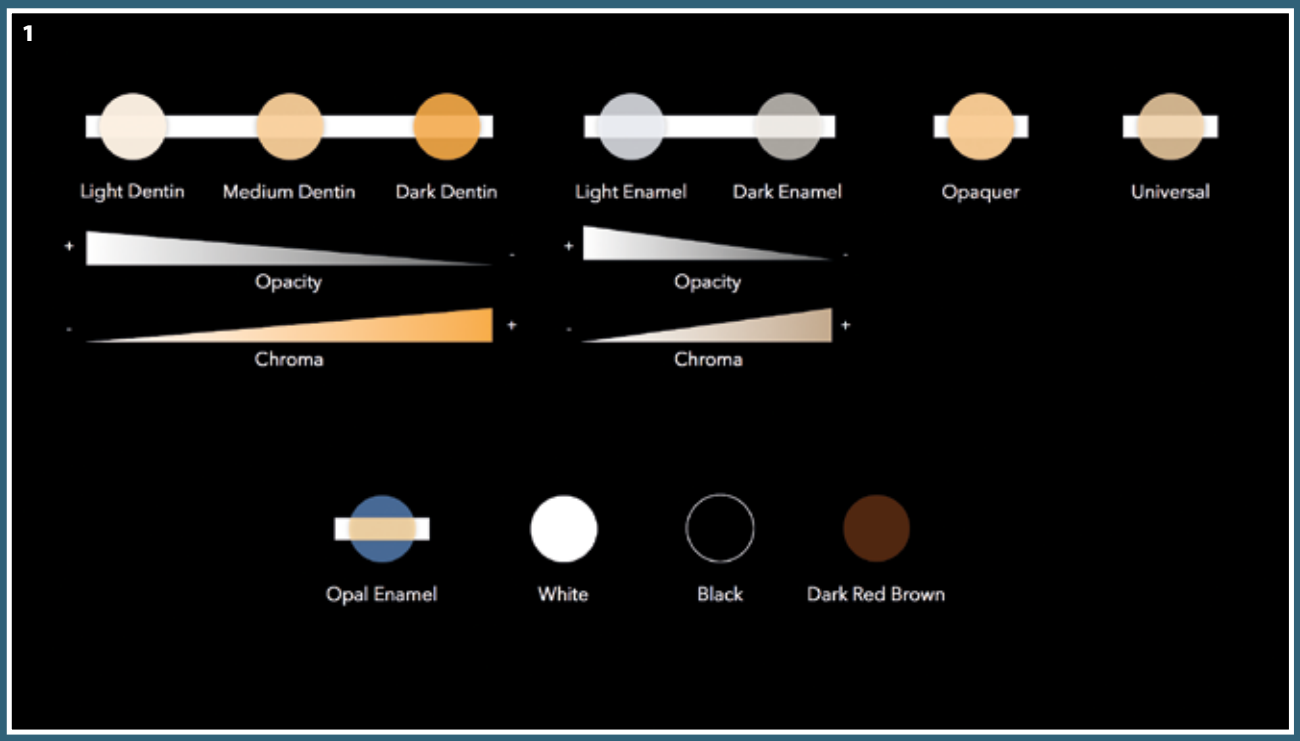


Table 1. Essentia complete shade range. Main shades (top row) & Modifiers (bottom row).

Table 2. Basic combinations of dentin and enamel shades.

and high opacity, while elder teeth have very high chroma and low opacity. Essentia is designed to use just three dentins (light, medium and dark) with increasing chroma and decreasing opacity in order to match the natural aging process. Enamels act in a very similar way, with whiter and more opaque enamel on young teeth and more translucent and chromatic on older teeth. Essentia uses just two enamel shades, one with high value (light) and another one with lower value (dark) and small amount of chroma.

Together, these three dentins and two enamels give four basic combinations that are used as a base for any anterior restoration: light dentin with light enamel (junior/bleach), medium dentin with light enamel (young), medium dentin with dark enamel (adult) and dark dentin with dark enamel (senior). Dark dentin and light enamel can be combined for posterior restorations, enabling a high chromatic dentin substrate to be modulated by higher value enamel on the occlusal surface.

Some specific situations such as a discolored substrate might require an additional step when layering composites. The system contains a high-filled opaque flowable composite in order to block discolorations with a very thin layer application. For young incisors with strong opalescent halo, Essentia provides a special enamel shade, optimized for a very natural opalescent effect.

For intrinsic or extrinsic characterization such as fissure staining or white spots, Essentia also features three flowable stains: white, black and dark red brown. Finally, to leave the door open for further simplification, one universal shade with an optimized chameleon effect was also included in the system. This material is designed to be used mainly in posterior region for one shade restorations. Its properties also make it a good option for heated composite cementation procedures.

From a chemical point of view, it is important to notice that dentin and enamel shades have different compositions. While dentin shades are optimized for a higher scattering effect mimicking that of the natural dentin, enamel shades are designed for a higher translucency with a very high polishability and gloss retention.

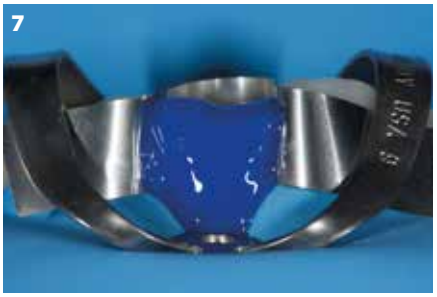
As demonstrated in the case reports, the clinical outcome of this simplified material is reaching high standards, with naturally blending restorations that integrate harmonically in the mouth. This shows that the ultimate simplification of composite systems is no longer a future possibility, but a present reality.

Essentia is designed to use just three dentins (light, medium and dark) with increasing chroma and decreasing opacity in order to match the natural aging process.

Posterior Case

1. Initial pre-operative situation. Occlusal caries on first lower molar
2. Absolute isolation
3. Preparation finished
4. Bonding agent applied
5. Dentin composite application. Dark Dentin shade
6. Enamel composite application. Light Enamel shade
7. Fissure staining application. Black and Dark Red Brown mixture
8. Finishing and polishing
9. Immediate post-operative situation
10. Final post-operative situation after full rehydration

Anterior Case



1. Initial pre-operative situation. Discolored centrals with old restorations, color mismatch

2. Initial pre-operative situation. Discolored centrals with old restorations, color mismatch

3. Initial pre-operative situation. Smile view

4. Shade evaluation with polar eyes. Small amounts of composite are applied and light-cured (without bonding agent). Light Dentin and Medium Dentin over cervical third, Light Enamel and Opal Enamel over incisal third (on both central and lateral)

5. Absolute isolation, left central incisor

6. Preparation. Removal of old restoration, minimal enamel reduction (0.1-0.2mm) and surface sandblasting (27µm)

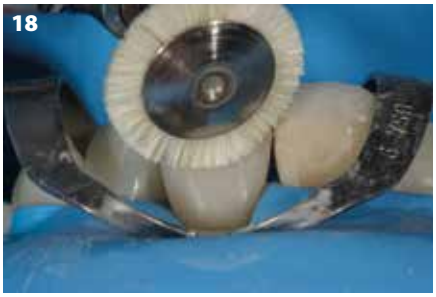
7. Enamel etching (35% Phosphoric Acid)

8. Bonding application

9. Silicon key application for creation of palatal enamel shell

10. Palatal enamel shell applied. Light Enamel shade

Anterior Case



11. Proximal wall reconstruction with help of matrix and wedge. Light Enamel shade

12. Dentin build-up, from cervical to incisal, one shade. Light Dentin shade

13. Application of opalescent effect shade at incisal third. Opal Enamel shade

14. Enamel build-up, from cervical to incisal, one shade. Light Enamel shade

15. Shape contouring and pre-polishing with disc

16. Polishing with diamond rubber point

17. Shape refining and superficial texture with diamond bur

18. Final gloss with goat hair brush and diamond paste

19. Proximal polishing with Epitex strips

20. Final after polishing

Anterior Case

21. Sub-exposed picture with contraster for incisal translucency and opalescent effect check

22. Preparation on right central incisor

23. Intra-operative situation on right central incisor, palatal enamel shell and dentin shade already applied

24. Final intra-operative situation

25. Final intra-operative situation with contraster, sub-exposed picture

26. Final intra-operative situation with contraster, texture check with soft-box illumination

27. Final post-operative situation after full rehydration

28. Final shade evaluation with polar eyes. Good color match with lateral incisor

29. Final post-operative situation after full rehydration. Surface texture check

30. Final post-operative situation after full rehydration. Smile view

Javier Tapia Guadix *was born in 1978 in Madrid, Spain. He finished dental school at the European University of Madrid in 2003. Working then as associate professor in the prosthetics department in 2004.*
In 2005 he started his career as professional computer graphics artist, focused on illustration, animation and application development. He founded the company Juice - Dental Media Design for this purpose. He received the Collegiate Merit Award by the Spanish College of Dentists from the 1st Region in 2005, for his collaboration in the commission of new technologies. In 2011 he founded together with Panaghiotis Bazos and Gianfranco Politano the Bio-Emulation group. He actively collaborates with several universities across Europe and is member of GC Restorative Advisory Board. Javier works in his private practice in Madrid, focused on restorative dentistry and esthetics. He is an international lecturer with participation in numerous congress, hands-on courses and live courses. He published several articles in restorative dentistry, dental photography and computers in dentistry.