Simplifying direct composite resin restorations in the aesthetic zone

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_The ability to create highly aesthetic direct composite resin restorations in a simplified manner has long been a goal for dentists. In the past, difficulties with direct composite resins have included shade matching, handling properties, premature setting under operatory lights, and overall ease of use. This article will describe a composite resin system (Amaris, VOCO) that has demonstrated desirable properties for use in both posterior teeth and especially in the aesthetic zone. Thereafter, a case report demonstrating the use of the material will be presented.

_Two-step shade matching concept

Tooth colour, with its varying shades and translucencies, is difficult to achieve between composite systems; for example, resins based on the porcelain VITA Classical shade guide (Vident) cannot achieve the desired results with consistency. Most composite systems work on the principle of matching composite to the basic shade ranges found in dentine and enamel. In order to create the polychromatic effect found in natural enamel and dentine, several things must happen.

To mimic the optical properties of hydroxyapatite enamel rods, composite resin must create the illusion of the way light is reflected in the natural tooth. Dentine is by nature opaque, providing teeth with their basic shades of yellow, brown, gray and blue. Enamel is by nature a white-translucent shade, providing teeth with their natural value.

Fig. 1_Pre-op situation: maxillary anterior teeth were discoloured, fractured and sensitive.
Fig. 2_Stained enamel was removed and a scalloped margin prepared.
Fig. 3_Margins were created at the interproximal surfaces of both teeth.
Fig. 4_A dual-cure, self-etching bonding agent (Futurabond DC) was applied.

Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 5_A custom shade tab was used to determine the correct opaque dentine colour.
Fig. 6_01 composite (Amaris) was tried against the prepared tooth.
Fig. 7_An initial layer of 01 was applied.
Fig. 8_A second 01 increment was then placed.

Using this basic principle, aesthetic restoration accomplished when using Amaris is simplified with an easy-to-understand, two-step shade concept with five opaque dentine and three translucent enamel shades.

Selecting the correct shade is simplified by using the custom shade guide, which is made from original light-cured composite material. Colour matching is greatly simplified because one does not have to employ a complicated and time-consuming multilayer shade technique. With minimal effort, colour matching is developed along the way. The colour of dentine shines through enamel and this system offers a shade system that follows this natural principle, simplifying direct aesthetic composite restorations into two simple steps. The material demonstrates an excellent chameleon-like effect with non-opaque shades and outstanding shade matching on the tooth. This excellent adaptation makes complex (shade) layering techniques unnecessary, and delivers an aesthetic result with fewer shades.

_Application possibilities

Amaris is a hybrid composite suitable for all classes of restorations. It is stable in posterior teeth and highly aesthetic for anterior teeth. A flowable version (Amaris Flow) supplements the restorative possibilities. With excellent wettability properties, the material flows directly out of the syringe into extremely small cavities. It is available in two special universal shades: HT (High Translucent) and HO (High Opaque).

The HT flowable is ideal for highly translucent incisal edges and small enamel or incisal defects, and as a high-gloss finishing layer. HO flowable is perfect for thinly masking discolouration, covering amalgam stains, mimicking the cervical areas in older teeth, blending with adjacent PFM crowns, and as a restorative base following endodontic treatment. Optimal matching of Amaris Flow to Amaris paste (in shade and translucency) allows combined application with the composite-bonded-to-flowable technique, without reducing the stability or aesthetics.

_Surface hardness and abrasion

The abrasion caused by chewing load is still a central aspect of the durability of restorative dental materials. High abrasion rates in the posterior tooth region lead to edge fractures and loss of the occlusion. Abrasion in the anterior tooth region leads to loss of lustre, which makes the restoration appear dull and unattractive. Thus, it is a fundamental goal of the development of restoratives to optimise hardness and abrasion resistance. The extremely high filler content (80.0 w/w %) provides the Amaris highly aesthetic hybrid composite with an exceptionally hard surface. This ensures a durable restoration owing to its high physical strength and high polish abrasion resistance.

Fig. 9_A custom shade tab was used to determine the correct translucent enamel colour.
Fig. 10_TL composite (Amaris) was tried against the prepared tooth.
Fig. 11_TL composite was then sculpted to shape, completing the restoration.
Fig. 12_The restored maxillary right central incisor next to the unrestored left central incisor.

Fig. 9

Fig. 10

Fig. 11

Fig. 12

Many filling materials can be polished to a high gloss simply because they are not particularly hard, but these materials lose their shine within a short amount of time owing to poor abrasion resistance; aesthetics at the price of durability is not a good compromise. In my experience, Amaris composite exhibits excellent polishing characteristics, high gloss and very good gloss retention. In addition, up to eight minutes of handling time in ambient operatory light, an additional bleach opaque shade and two flowable choices cover all clinical situations, helping to make this a versatile material.

The following case report demonstrates a clinical situation for which this composite system was successfully utilised to achieve optimal anterior aesthetics.

_Case report

The patient, a 23-year-old female, presented with the chief complaint of discoloured, fractured and sensitive maxillary anterior central incisors (Fig. 1). A direct composite restoration was selected as the treatment of choice to correct the aesthetic deficiencies, tooth sensitivity and structural flaws with minimal tooth reduction. Following administration of local anaesthesia, minimal tooth preparation was accomplished using a football-shaped diamond bur (SS White) and a standard round-end, tapered chamfer diamond bur (SS White). The stained enamel was removed and a scalloped preparation margin was created at the interproximal of both central incisors (Figs. 2 & 3). Discolouration at the composite–tooth junction (i.e. margin) is an indication of micro-leakage and can be an in-

Fig. 13_A dual-cure bonding agent (Futurabond DC) was applied to the left central incisor.
Fig. 14_O1 dentine replacement was applied.

Fig. 13

Fig. 14

Fig. 15

Fig. 16

Fig. 17

Fig. 18

Fig. 15_A final layer of TL composite was placed.
Fig. 16_The maxillary central incisors restored with unfinished composite.
Fig. 17_The restorations after contouring and shaping, before finishing and polishing.
Fig. 18_The completed case.

dicator of the presence of caries. The frequency of margin discolouration is affected by the adhesive chosen, the adhesive technique utilised, the composite itself and the finishing technique employed.

The left central incisor was first isolated from the bonding procedure using Teflon tape. The right central incisor was then treated with a dual-cure, nano-reinforced, self-etching adhesive (Futurabond DC, VOCO; Fig. 4) and light-cured. Next, an opaque-dentine shade button was selected that best matched the tooth. The Opaque (O1; Amaris shade tab, VOCO) was matched to both the prepared tooth and the adjacent unprepared lateral incisor (Fig. 5). The O1 composite was then tried against the prepared tooth (Fig. 6) and sculpted, leaving a 0.5 mm thickness for the final enamel layer (Figs. 7 & 8). This composite was designed so that it would not stick to the instruments, allowing it to be shaped in the cavity with simple movements with almost no pressure.

Next, the Translucent Light (TL) was matched to both the prepared tooth and the adjacent lateral incisor (Fig. 9). Then, the TL composite was tried against the prepared tooth (Fig. 10), and this final enamel layer was sculpted to shape (Figs. 11 & 12). These same steps were then taken for the maxillary left central incisor (Figs. 13–15). Once both maxillary central incisors had been restored (Fig. 16) and the occlusion checked, the restorations were finished to proper anatomic morphology (Fig. 17) and polished (Fig. 18).

_Conclusion

A technique for placing direct composites that allows a predictable outcome in the aesthetic zone has been demonstrated. In my opinion, the simplicity of shade matching and aesthetics, ease of application, finishing and polishing, and the strength and durability make Amaris an ideal choice as a direct restorative material._

_about the author

Dr Ian Shuman runs a general, reconstructive and aesthetic dental practice in Pasadena, Maryland (USA). As an educator and author, he is a pioneer in developing advanced, minimally invasive techniques. His mission is to teach dental professionals current methods for creating beautiful, long-lasting restorations that preserve the maximum amount of tooth structure. He is a Fellow of the Pierre Fauchard Academy and a member of the American Dental Association and the American Academy of Implant Dentistry. He can be contacted at ian@ianshuman.com.