

NEW PRODUCT

review



FILTEK Z250 AND FILTEK P60 (3M)



by
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The history of composites depicts an evolutionary path where microfills were the sole material of choice for anterior restorations while macrofills were utilized in stress-bearing areas of the oral cavity. Later, universal composites that could be placed both anteriorly and posteriorly were introduced to establish a new trend in the dental profession, which remains until today. Hybrids and microhybrids have been largely utilized since their introduction because of their ability to satisfactorily fulfill the esthetic and functional demands for both anterior and posterior restorations. High strength and improved polishability have contributed to making universal restoratives the system of choice among clinicians worldwide.

3M has recently introduced Filtek Z250 Universal Restorative and Filtek P60 Posterior Restorative. These composites utilize a new resin system that evolved from the Z100 Universal Restorative system. In the Filtek line of products, the majority of TEGDMA (tri {ethylene glycol} dimethacrylate), present in its predecessor, is replaced with a blend of UDMA (urethane dimethacrylate) and BisEMA (Bisphenol

A polyethylene glycol diether dimethacrylate). These changes to a higher molecular weight resin matrix are supposed to account for lower volumetric shrinkage, reduced aging, and a higher fracture toughness, in addition to greater hydrophobicity (making the system less sensitive to atmospheric moisture).

Improvements in the chemistry of the resin matrix and particle size distribution have led to enhanced handling characteristics of Filtek Z250 and P60. Their higher viscosity allows for enhanced material handling and packability, allowing good proximal contacts. With Z250 and P60, each increment can be artistically sculpted to optimal contours with virtually no slumping before light curing. Their ability to be incrementally sculpted to full contour minimizes finishing and saves precious clinical time. Whereas the filler remains essentially the same as Z100 restorative filler, there have been, however, significant processing changes to maximize filler consistency. The particle distribution is 0.01 mm to 3.5 mm with an average particle size of 0.6 mm and the filler loading is 83% for P60 and 82% for Z250 in weight. The 1% difference in filler loading translates into a 6% DECREASE in the resin matrix, which in turn accounts for the difference in handling and viscosity between the two products. This feature accounts for an improved surface smoothness and wear resistance. Although Z250 provides a high initial polish, veneering it with a microfill composite in anterior situations is still a viable option because of the unparalleled polishability imparted by microfills.

Filtek Z250 and Filtek P60 represent improvements in practically all physical properties over their predecessor in order to present wear resis-



Figure 1



Figure 2



Figure 3



Figure 4

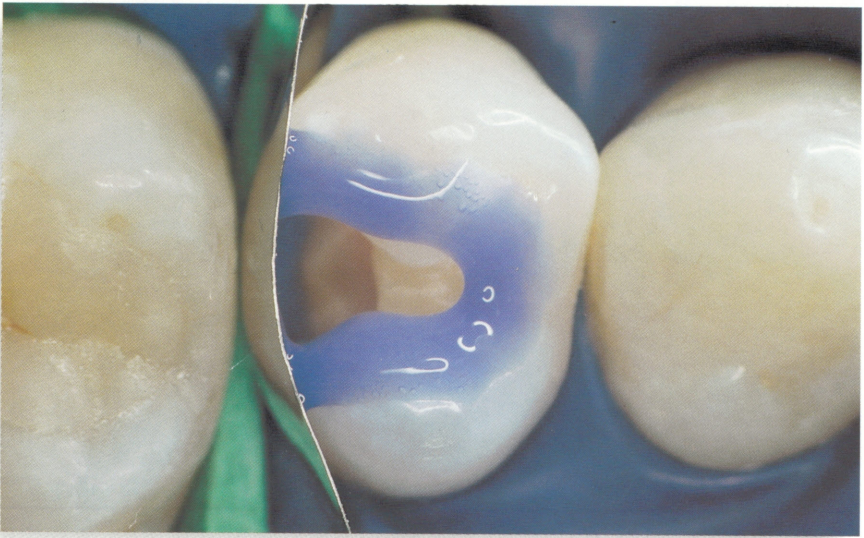


Figure 5



Figure 6

tance and high fracture toughness, in addition to reduced polymerization shrinkage and post-operative sensitivity.

The key features for a universal restorative when used in anterior applications are esthetics, handling, polishability and durability. Bearing optical properties that mimic those of natural dentition, i.e., translucency, opacity, fluorescence and opalescence, are paramount for achieving proper blending and color match. When properly applied, contoured and finished, Z250 blends in with the natural dentition so that the restoration becomes virtually invisible. (Figures 1 and 2)

Filtek Z250 is available in a wide range of shades with esthetic color characteristics. In addition to the most commonly used Vita shades, Z250 also introduces an incisal (I) shade, an opacious Universal Dentin (UD) shade, and a B0.5 shade, which blends well with lighter-than-usual and bleached teeth. P60 is available in three shades that suffice for providing excellent posterior esthetics. Available in both capsules and syringes, Z250 and P60 have a three-year shelf life.

Of great clinical significance is the reduced curing time: 20 seconds to polymerize an increment of 2.5 mm for all shades except UD, C4 and B0.5 which require a 30-second cure using a halogen light at a depth of 2.0 mm..

Following is a technique for a direct Class II restoration using P60:

- After rubber dam isolation, cavity preparation is performed limiting tooth substance removal to carious tissue. (Figures 3 and 4) All cavosurface enamel margins should be trimmed (not beveled) to remove unsupported prisms.



Figure 7



Figure 8

- Effective wedging follows placement of a sectional matrix and ring retainer (Composi-Tight – GDS, Spring Lake, MI). This step of the procedure must be properly carried out in order for physiologically tight proximal contacts to be achieved.
- Enamel and dentin are acid-etched with 32-38 % phosphoric acid gel for 15 seconds, rinsed and gently dried with a quick blast of air. (Figures 5 and 6)
- A single component dentin/enamel adhesive is applied and light cured.
- Following adhesive application, a flowable composite may be applied to all cavity walls as a thin liner to act as a "shock absorber" and to better wet cavity irregularities and undercuts, and light cured.
- Following burnishing of the soft metal matrix band, Filtek P60 is injected into the proximal box, packed short of the contact area, and light cured. (Figure 7)
- A second increment is injected and sculpted to the desired occlusal morphology with an instrument. P60's excellent handling characteristics allows for precise anatomy placement with virtually no slumping. (Figure 8) A brush damp with a surface sealant should be used to accommodate the composite against the cavosurface margins thus minimizing chances of gap formation.
- The second increment is further light cured from the occlusal aspect and the retainer, wedge and matrix band are removed. An air-inhibiting medium such as glycerin or oxalate gel should be applied to all exposed restoration surfaces, and light curing of the

buccal and lingual aspect should be performed for 40 seconds each to ensure thorough polymerization.

- The restoration is finished and polished using carbide and fine diamond burs, rubber points of varying abrasiveness, followed by silicone carbide brushes and aluminum oxide paste applied on a felt point. (Figure 9)
- Upon removal of the rubber dam, the occlusion is checked and the surface morphology refined, if necessary. Following, the restoration margins and occlusal anatomy are etched/cleaned with 32-38% phosphoric acid gel, rinsed, and dried.
- Brown and ochre tints can be sparingly applied to sulci and fossae to further emphasize polychromy and light cured. A surface sealant should be applied, thinned with air, and light cured to ensure optimal marginal sealing and wear resistance.
- The result is a strong, durable and extremely esthetic restoration. (Figure 10) *AK*



Figure 9



Figure 10



just a REMINDER

Please take note of the following deadlines for future issues of the AACD Journal. Articles must be submitted by these dates:

- FALL 1999 ISSUE** due August 6, 1999
- WINTER 1999 ISSUE** due November 3, 1999