3M™ ESPE™ Filtek™ Supreme Universal Restorative was developed as an esthetic restorative and within a year of its introduction was one of the leading universal restoratives in the world. With the creation of Filtek™ Supreme Plus Universal Restorative, our goal is to help dentists take direct composite layering to the next level with improved shades and even better cosmetic results.

Filtek Supreme Plus Universal Restorative is esthetic enough for single or multi-layer anterior restorations, yet strong enough for posterior use.

At 3M ESPE, our belief is that restorative layering often yields the most natural-looking result. Yet even when just one shade is used, optimum results can be achieved using Filtek Supreme Plus Universal Restorative. That’s why we developed this booklet—to help familiarize you with this breakthrough restorative material, help you start layering when you’re ready, or help boost your skill level if you’re a layering veteran.
About the clinical cases

To aid you as you learn and grow in your practice, we approached some leading global practitioners and asked them to share clinical cases and short tips and tricks when layering with Filtek™ Supreme Plus Universal Restorative.

For each clinician's case, some basic background is provided along with tips and tricks. While there is no one way to perform these techniques, we know you’ll find value in examining these restorations by dentists who have extensive clinical experience with composite restorations.
Clinical Cases

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Supreme Tips

Dr Grant Chyz, Seattle, USA

Dr. Grant Chyz is a Seattle, Washington, practitioner and a pioneer in the area of composite layering. He, among others, consulted in the development of both the original Filtek™ Supreme Universal Restorative and Filtek™ Supreme Plus Universal Restorative.

Though aware that dentistry is both a science and an art that allows for personal preferences in technique, after years of clinical practice Dr. Chyz has developed these general tips and tricks for layering composites.

1. Shade recipes can only provide a starting point for the restoration of each tooth. The thickness of each shade layer will have a significant effect on the appearance of the final restoration. (Figure 1)

2. The four-shade formulas on the shade wheel are based upon a putty matrix technique that allows the dentist to accurately place the lingual wall and the incisal edge. (Figures 2-4)
3. In general, the larger and deeper the cavity or defect, the more shades it takes to achieve a lifelike result. (Figures 5-8)

4. Use the more opaque dentin shades when it is necessary to change the shade of the underlying tooth or when simulation of dentin opacity is desired, as when there is a lack of dentin behind the restoration (Class IV and larger Class III’s).

5. Think of the labels Enamel, Body and Dentin as designations that mean translucent, moderately translucent and moderately opaque. These materials all have the same strength and they are equally polishable.

6. Do not use thick layers of “Enamel” shades.

7. Think of WE (White Enamel) as a nearly universal enamel shade and D2E as a lower value (slightly grayer) enamel when used in thin layers. A and B shade enamels blend nicely with supporting tooth structure.

Fig 5. The larger and deeper the cavity, the more shades required to achieve a lifelike effect

Fig 6.

Fig 7.

Fig 8. Diagram of Filtek™ Supreme Plus layers as shown in Fig 5-7
8. Where opacity isn’t a requirement, body shades blend nicely and can be used as “Dentin.”

9. The Translucent shades of Filtek™ Supreme Plus Universal Restorative are specialized highly translucent tinted composites. They are like tinted glass. Use them to create translucency (inside the incisal edge of a large class IV for example). Blend them carefully as they are more challenging to handle and it is easy to incorporate air bubbles into the matrix. (Figures 9-12)

10. The Translucent Clear shade can be used inside the incisal edge, or it can be used over the surface to create depth. For example, in older patients with darker teeth, A6D can be covered with a thin layer of translucent clear to match teeth with dark dentin but rather clear enamel.

Fig 9. Chipped incisal edge on a rotated tooth

Fig 10. Use of Translucent shades over A1B and WE to mimic a delicate incisal edge

Fig 11. Restored incisal edge with instant orthodontic rotation to prevent future edge fracture

Fig 12. Full smile after correction
11. When using a Translucent shade on the surface, it is best to have a thin layer over the entire restoration, since the Translucent shades appear to polish to an even higher luster than microfills (or the other Filtek™ Supreme Plus shades). (Figures 9-12)

12. If a restoration looks dark, try using a thin “adjustment” layer of WB (White Body) or WD (White Dentin) to raise the value (less gray). This must be a sub-surface layer. (Figure 13-16)

13. For total block-out, actual opaquers may be required.

14. When using a new composite material or getting used to using more than one shade for layering, work with it in the posterior of the mouth until you are comfortable with the shades, translucency, opacity, etc. Once you feel confident in the posterior (where few complaints concerning esthetics occur) begin more complex work in the anterior. Remember, using a second shade does not take longer than incremental placement of one shade of material as long as the material is ready to use at the time of placement.

15. Use round ended burs or diamonds for preparations. Rounded line angles enhance tooth strength and make it easier to adapt the composite.

Fig 13. WD and WB to cover and reposition a dark tooth

Fig 14. Combination of opacities allow shade adjustment without an overly opaque appearance

Fig 15. The WD layer covers the entire facial surface in a thin layer to block out the underlying tooth color. WD was also used to create the incisal edge and mammelons.

Fig 16.
16. Learn to build to full contour rather than overfilling (the opposite of what we learned to do with amalgam). Managing the thickness of each layer is one of the keys to success when using multiple shades and opacities of composite (see #1).

17. Remember to choose the shade(s) at the beginning of treatment and before placement of the rubber dam. The goal is to avoid desiccation of the teeth. Desiccated teeth appear lighter than a tooth that is fully hydrated. Trying small samples of material on the tooth can help sort out the shade puzzle in difficult cases. (See Figure 13)

18. Keep the teeth wet, right up to the time of etching. Keeping the teeth wet optimizes bonding to dentin and minimizes post-operative sensitivity while helping to preserve the true color of the teeth. Even though you choose your shades at the beginning of treatment, it is helpful to work with teeth that have not experienced a significant color shift, so that you get immediate visual feedback.

19. Magnification is nearly essential for layering techniques that call for three or more shades. Those who use magnification do not need to hear this and those who do not, don’t think they need it. Would you play tennis with a traditional head size, or golf? Magnification makes the intricate job that we do seem less intricate.

20. Take pride in your improvement and show it off. Your staff and your patients will love it!
Minimizing the "White Line"
Dr Michael Mandikos, Brisbane, Australia

Patient with failed anterior restoration.

Right lateral incisor prepared for Class IV with labial enamel bevel. Wide and gradually tapering bevel has no abrupt end line which helps to improve the esthetic integration of composite and tooth. (Figures 1-2)

Completion of restoration placement using Filtek™ Supreme Plus Universal Restorative shades A1D and A2E, with a superficial layer of Gray Translucent. (Figure 3)
Tungsten carbide burs rotate in a clockwise direction. Apply the bur to the composite first then move it towards the enamel. (Figure 5)

Twelve fluted tungsten carbide finishing and shaping burs leave the composite surface relatively smooth with no visible scratches, unlike the surface often obtained with medium and fine grit diamonds. (Figure 4)

Align the handpiece to ensure that the rotating bur meets the composite first and then the enamel. (Figure 6)
Restoration with final shaping completed with smooth surface suitable for polishing. Note the intact enamel-composite margin. (Figure 7)

Immediate post-operative appearance of finished restoration. (Figure 8)

Diagram of Filtek™ Supreme Plus Universal Restorative shades placement for this case.

Clinical Tips:

The lifelike shade matching ability of Filtek Supreme Plus Universal Restorative combined with its enhanced gloss and polish retention features make it a choice material for direct esthetic restorations.

A recent study* has confirmed the excellent opalescent properties of Filtek Supreme Translucent Gray and Yellow shades.

Placing Direct Composite Veneers

Dr Hein de Kloet, Arnhem, The Netherlands

Patient with inadequate restorations and discolored teeth resulting from endodontic treatment – generally poor esthetics. (Figure 1)

Rubber dam isolation during bonding and basic restoration build-up. Filtek™ Supreme Plus Universal Restorative shades A3B and A2B used to restore the approximal and incisal basic anatomy and function. (Figure 2)

Rubber dam is removed and the occlusion checked. Automatrix NR Bands (Dentsply) are used to isolate the cervical and buccal surfaces. (Figure 3)

Prior to placement of the direct veneers for these teeth, the basic tooth-form build-up is shaped and contoured. (Figure 4)
Filtek™ Supreme Plus Universal Restorative shade A3B is placed in the cervical part of the matrix and spread using a thin metal instrument and a silicon brush-type instrument (Micerium, Italy). (Figure 5)

After curing, a second layer is applied using A2B which has less chroma and is a higher value shade. The incisors are restored in a similar way to the canines using shade A2B placed cervically and the more translucent A2E towards the incisal. (Figure 6)

To imitate the natural teeth in this patient a subsurface white tint (Kolor + Plus®, KerrHawe) is used for cracks and white spots.

Completed restorations. (Figure 7)
Diagram of Filtek™ Supreme Plus Universal Restorative shade placement for this case.

Clinical Tips:

The combination of strength, optimized shading and opacity effects, coupled with the enamel-like polish of Filtek Supreme Plus Universal Restorative, enable the clinician to create authentically lifelike results in both the straightforward and more complex cases.
Direct Composite Build-Up With Supra-Gingival Margins

Dr. Eric Tan, Melbourne, Australia

Patient with severe tooth wear. (Figure 1)

Modern composite resins have optical properties that allow very conservative preparation in situations where the margin can be feathered out supragingivally.

Proposed restorative margins. (Figure 2)

The final tooth profiles are waxed up on an articulated model with exaggerated separation in the interproximal embrasures, and ensuring that the wax is not excessively thick in any area. (Figure 3)

A clear silicone registration key is taken of the wax up and trimmed to a stop distal to the last tooth being restored. (Figure 4)
The first tooth to be prepared is isolated with a matrix strip, cleaned with a sandblaster and prepared for bonding. Isolation with the matrix strip is maintained during the etching and bonding process. (Figure 5)

After isolation from adjacent teeth, the bonding agent is applied. (Figure 6)

Filtek™ Supreme Plus Universal Restorative is injected into the silicone matrix and the matrix is firmly seated over the teeth. This is followed by light curing the selected tooth for 5 to 10 seconds with a high intensity curing light. (e.g. Elipar™ FreeLight 2 LED Curing Light) (Figures 7-8)
After the initial composite set, the matrix is removed. The contact area is freed using an interproximal separating saw and abrasive strips. (Figure 9)

After separation and removal of gross interproximal excess, the composite is cured. Restoration of remaining teeth is accomplished by repeating the process shown in Figures 5 through 10 for each tooth. (Figure 10)

Completed restoration. (Figure 11)

These restorations were all fabricated using a single shade of Filtek™ Supreme Plus Universal Restorative for each tooth – A2E.
**Clinical Tips:**

It is helpful to apply a thin film of Vaseline to the interproximal surface of any previously finished adjacent restorations before the matrix strip is pulled through and removed. This prevents the new increment from bonding to the neighboring restoration when it is seated on the tooth in the silicone matrix, and allows easy separation.

The thickness of the diagnostic wax-up must not exceed 1-2mm to ensure adequate depth of cure of the composite.

There will invariably be a thin flash of excess composite beyond the desired finishing line – this can be polished back to a feather edge finish.
Direct Resin Successive Cusp Technique

Dr. William Liebenberg, Vancouver, Canada

Defective amalgam for replacement. (Figure 1)

After completion of the bonding step the composite is placed to restore each cusp in turn, the ‘successive cusp’ approach. (Figure 2)

Placement of mesiolingual and distobuccal cusps. (Figure 3)
Distolingual cusp build-up. (Figure 4)

Minimal finishing is needed because the anatomy is built in using this approach. (Figure 5)

A single shade of Filtek™ Supreme Plus Universal Restorative shade A1E was used in this case, plus some stain characterization of the occlusal fissures. (Figure 6)

**Clinical Tips:**

Using a single shade of Filtek Supreme Plus is a less complicated clinical approach which can still give uncompromising esthetic results.
Using Geometric Anatomical Layers

Dr. Gustavo Di Bella, Argentina

Damaged molar tooth in need of esthetic direct restoration. (Figure 1)

Features of Geometric Anatomic Layers:
(Figure 2)

- Four layer restoration
- Reduction of stress and "C" factor effect by means of flowable composite
- Ease of placement
- Reduction of post-operative sensitivity
- Enhanced 3D effect of the shades
Placement of layers 1 & 2, Dentin shade A6D. A geometric triangular shape is placed with the base of triangle toward the cavity margin. One triangle is placed for each cusp to be restored. (Figures 3-4)

Placement of layers 3 & 4, Body shade A2B. Triangles are placed with their base positioned toward the center of the cavity and the apex positioned toward the margin. One triangle is needed per cusp and also for each marginal ridge. (Figure 5)
Fig 7. Placement of layers 5 & 6 Enamel shade A1E, and Translucent Yellow. To complete the restoration these triangles have their bases towards the cavity margin and their apices facing the center of the restoration. One triangle per cusp. (Figure 6)

Completed restoration. (Figure 7)

Clinical Tips:

The quality of handling of Filtek™ Supreme Plus Universal Restorative allows the clinician to precisely place and blend each increment of composite to achieve the desired esthetic result.
Posterior Composite

Dr. Putignano, Ancona, Italy

Patient with failed amalgam. (Figure 1)

Matrix placed for interproximal enamel wall build-up. (Figure 2)

Interproximal enamel wall placed and cured. This can be built up in layers, or, more usually, with a single application, and can be done very quickly.

Matrix removed and a thin layer of Filtek™ Flow Flowable Composite* shade A3 placed on the cavity floor. (Figure 3)

* The nanofilled Filtek™ Supreme Plus Flowable is now available for this procedure.
This is followed by a layer of Filtek™ Supreme Plus Universal Restorative shade A2D to mask any dentin pigmentation. (Figure 4)

Composite build-up continued following the shape of the anatomical features of the tooth. Filtek Supreme Plus Universal Restorative shade A2B was used in this case. (Figure 5)

Characterization of the occlusal surface was created using brown and white tints (Heliotints®, Vivadent) to create a pits and fissures effect. White spots were added to emphasize the triangular ridges. These characterizations were added during the composite build-up so that any subsequent occlusal adjustments did not compromise the esthetics. (Figure 6)
Completed restoration with a final layer of shade Translucent Yellow. (Figure 7)

Diagram of Filtek™ Supreme Plus Universal Restorative shade placement for this case

Clinical Tips:
Precise placement of composite and good handling control are needed for an interproximal wall build-up (Fig 3). Filtek Supreme Plus Universal Restorative handling and strength allows the clinician to quickly and accurately complete this procedure.
Registering Tooth Shade and Anatomy

Dr. Alvaro Delgado and Dr. Carlos Fernandez, Madrid, Spain

Eight year-old patient with a fractured incisor. (Figure 1)

It is often difficult in a limited clinical session to visualize and remember all the anatomical details and color of a tooth. A simple method to register this information is a study model and good photography. Study models show the anatomy of adjacent teeth, the shape, surface texture, alignment and occlusion, and allow for a wax-up of the clinical case. (Figure 2)

Though color cannot be accurately recorded with photography, when a color reference is included in the photograph (e.g. Vitapan™ Classical Shade Guide), this method is quite reliable. (Figure 3)
To get maximum advantage of the clinical information available and obtain an optimal result, it is useful to utilize computer software. Digital photography and software such as Microsoft® PowerPoint® or Adobe® Photoshop® grades the sharpness and brightness, and translates the color to a gray scale. (Figure 4)

This gives us additional information about:
- The incisal translucent area and general level of translucency
- The opalescent halo
- The anatomy, especially of the mammelons
- Other characteristics such as stains and enamel fissures

This information is useful for obtaining an optimal esthetic result with both direct and indirect restorations. (Figures 4-5)

This case was done using Filtek™ Supreme Plus Universal Restorative shades A4D, A3D, GT, WE, A2B and A2E. (Figure 6)
Diagram of Filtek™ Supreme Plus Universal Restorative shade placement for this case.

**Clinical Tips:**

Filtek Supreme Plus Universal Restorative has application for restoration of both primary and permanent teeth in children; shade WE (White Enamel) is an excellent match with the bright white color of primary teeth.
Clinical Wear Performance of Filtek™ Supreme and Z100™ in Posterior Teeth

Professor Paul Lambrechts and colleagues, University of Leuven, Belgium

This clinical study compared the wear of Filtek™ Supreme Universal Restorative with 3M™ ESPE™ Z100™ Restorative and enamel. Thirty-seven Class I & II restorations, 18 with Filtek Supreme Universal Restorative and 19 with Z100 Restorative, were placed in first or second molars directly in occlusion with the natural dentition. All restorations were placed under rubber dam and bonded using 3M™ ESPE™ Single Bond Adhesive. The majority of restorations were amalgam replacements. (Figure 1)

The occlusal contact area wear of the composites and enamel was calculated from replica models using laser profilometry, and the restorations were clinically evaluated according to USPHS criteria. (Figures 2-3)
Quantitative 3D laser scanning was done to measure volume loss, vertical loss at selected attrition points clinically shown with articulating paper, and the differential wear relative to enamel. (Figures 4-5)

### Results

Mean (sd) occlusal contact area wear in microns.

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<th>Filtek Supreme</th>
<th>Z100</th>
<th>Enamel</th>
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<tbody>
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<td>6 months</td>
<td>48 (17)</td>
<td>50 (19)</td>
<td>46 (24)</td>
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<tr>
<td>12 months</td>
<td>64 (31)</td>
<td>59 (20)</td>
<td>58 (19)</td>
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There was no statistically significant difference between the wear of Filtek™ Supreme Universal Restorative versus enamel, or between wear of 3M™ ESPE™ Z100™ Restorative versus enamel.

### Conclusions:

At one year Filtek Supreme Universal Restorative showed clear evidence of good wear characteristics. Its clinical wear performance and that of 3M ESPE Z100 Restorative were comparable to human enamel.

**Clinical Wear Performance of Filtek Supreme and Z100 in Posterior Teeth.**

Bharadwaj D, Lambrechts P, De Munck E, Mattar D, van Meerbeek B.

Presented at the International Association of Dental Research Meeting, Honolulu, 2004.

**Note:** Since 3M™ ESPE™ Filtek™ Supreme Plus Universal Restorative shares the same chemistry as Filtek Supreme Universal Restorative (varying only in shading and opacity), technical data from clinical and laboratory investigations into Filtek Supreme Universal Restorative are still valid.
Filtek™ Supreme Plus

For additional scientific results, see the 3M publication:

*Filtek™ Supreme Plus Universal Restorative; A collection of scientific results.*
Also available from 3M ESPE:

*Introduction to Layering with Filtek™ Supreme Plus Universal Restorative.*

This step-by-step booklet introduces the concept of layering with the Filtek Supreme Plus Universal Restorative system. An excellent clinical case highlights the potential of layering in a very large Class IV restoration. The concept of using a typodont model to explore layering is also described. To request a copy, ask your 3M ESPE sales representative or call our Customer Care Hotline at 800-634-2249.
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