

THE DENTAL ADVISOR™

"Improved Patient Care Through Research"



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Layered Resin Composites

Since the introduction of resin composites, there have been many advances in the esthetics of direct restorations. The desirable properties of highly polishable microfills and high strength hybrids have been combined to form new composites known as microhybrids and nanofills. These composites can typically be used for both anterior and posterior restorations. More recently, clinical techniques that use layering of composites to mimic the natural layering of dentin and enamel have become popular.

Natural teeth are intricate with variations of shades, opacities and textures. Layering of composites to simulate natural teeth involves the use of opaque dentin shades, which are overlaid by more translucent enamel shades.

Applications

- In cases where a high level of esthetics is desired.
- When an esthetic, direct restoration is selected over a ceramic or laboratory composite.
- For through-the-tooth anterior restorations and incisal edges.
- For direct composite veneers.
- To block or opaque dark underlying tooth structure.

Advantages of Layering

- Excellent esthetics.
- Create opacity and translucency where needed.
- Systems are complete – can usually be used for all types of restorations.

- Layering using 2-mm increments (as limited by the light source) does not take any more time for placement than a single shade.

Disadvantages of Layering

- Requires time and practice.
- Shade matching may not follow Vita Classic guide.
- May be difficult to identify composite when replacing restorations in the future.
- Layering systems are generally more expensive.
- Requires more shades and use of more than one compule for each restoration.

Microhybrids – Esthetic properties of microfills while having good strength – commonly used as a universal or layering composite (**4 Seasons, Venus**).

Reinforced Microfills – Greater strength than conventional microfills due to higher filler load. Use sparingly for higher stress restorations such as large Class II restorations (**Microne**).

Nanofills – Newest class of composites, consisting of nanofillers (<0.1 µm) and other particles similar to a microhybrid. Nanofiller particles help to improve handling and polishability while increasing the filler load. Their strength is in the range of hybrid composites, and they have relatively low shrinkage (**Filtek Supreme**).

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Rating Layered Resin Composites

Product	Company	Type	Bonding Agent in Kit	Filler, Volume %	Dentin/Opaque Shades	Enamel/Translucent Shades	Bleach Shades	Shade Guide	Designed for 3 or More Layers	Shade Guide/Layered Tabs	Flexural Strength	Flexural Modulus	Shelf Life, Months	Cost, \$/ml*†	Rating
ESTHET.X	DENTSPLY/CAULK	Microhybrid	PRIME & BOND NT	60 23	5	3	Vita Classic	Yes	Yes/No	MH	H	36	49.46	90%	
FILTEK SUPREME	3M ESPE	Nanofill	ADPER PROMPT L-POP SELF-ETCH ADHESIVE	58-60	18	9	2	Vita Classic	Yes	No/No	MH	H	36	56.00	92%
4 SEASONS	IVOCLAR VIVADENT	Microhybrid	None	55-58	12	24	4	Vita Classic	Yes	Yes/No	MH	MH	48	30.02	91%
GLACIER	SDI	Microhybrid	STAE	62	8	14	1	Vita Classic	No	Yes/No	MH	H	60	22.49	91%
GRADIA DIRECT	GC AMERICA	Microhybrid	None	64-65	17	8	1	Vita Classic	Yes	Yes/Yes	M	M	24	17.68	ce
MICRONEW	BISCO	Reinforced Microfill	None	51-53	3	21	3	Vita Classic	Yes	No/No	M	MH	36	15.26	86%
MIRIS	COLTENE/WHALEDENT	Microhybrid	None	59	10	6	1	Proprietary	No	Yes/Yes	MH	H	24	55.71	90%
POINT 4	SDS/KERR	Microhybrid	OPTIBOND SOLO PLUS	57	8	19	3	Vita Classic	Yes	No/No	MH	MH	24	26.58	na
SIMILE	PENTRON CLINICAL TECHNOLOGIES	Nano-hybrid	None	68	17	2	2	Vita Classic	No	No/No	M	H	48	15.60	88%
3D DIRECT	VIDENT	Microhybrid	None	65	13	4	3	Vita 3D-Master	Yes	No/No	M	MH	36	26.32	86%
VENUS	HERAEUS KULZER	Microhybrid	GLUMA COMFORT BOND + DESENSITIZER	61	7	18	2	Vita Classic	Yes	Yes/No	M	H	48	50.86	92%
VIT-L-ESCENCE	ULTRADENT	Microhybrid	PQ1	58	18	13	2	Proprietary	Yes	Yes/Yes	H	H	48	24.22	na

M=medium, MH=medium high, H=high, ce=currently being evaluated, na=not available
 *Cost based on introductory kit with compules (if available) that may include bonding agent and accessories.
 †Costs are listed for comparison only and are not used to calculate the ratings. All costs are listed in U.S. dollars.

THE DENTAL ADVISOR Recommends:

Filtek Supreme, Venus, 4 Seasons, Glacier, Esthet.X, Miris



Filtek Supreme
(3M ESPE)



4 Seasons
(Ivoclar Vivadent)



Glacier
(SDI)



Esthet.X
(DENTSPLY/Caulk)

Layered Resin Composites *continued*

Composite Selection

- Kits with more dentin/body shades and fewer translucent shades are better suited for posterior restorations (***Simile***). Kits that have more enamel/translucent/incisal and bleach shades are better for anterior restorations (***Filtek Supreme, Miris, Venus***).



Miris (Coltene/Whaledent)

- Most kits allow single-shaded restorations using either body or enamel shades alone. The esthetics using a single shade varies.
- Usually two shades for posterior teeth are sufficient. For anterior teeth, use of two or more shades, including opaque or translucent shades, can greatly increase esthetics.

Clinical Tips

Shade Selection

- For more accurate shade matching, bleach teeth a minimum of one week before placing composite restorations.
- Do not overdry before shade matching.
- Select shades before placement of rubber dam material.
- Avoid distracting colors such as lipstick, bright bibs, or bright clothing.
- When the adjacent teeth are significantly different in shade, try to match the lighter shade.
- Limit shade matching to five seconds at a time. Usually your first perception is the best match.
- If a shade cannot be selected to match, choose the closest two shades and start with the lighter shade. Lighter shades are easier to darken.
- When using for the first time, select posterior teeth without great esthetic demands to become accustomed to the layering characteristics of the system.
- For visual confirmation of shades selected, place small amounts of composite on a surrounding tooth surface and light cure before bonding.

- Place layers on an unprepared tooth to verify shade selection.
- A dark shade over a light shade has greater impact than the reverse.

Layering

- Rubber dam use is recommended.
- The appearance of the finished restoration is due to the layered thicknesses of each of the underlying composite shades. Underlying dentin should be thickest at the cervical portion of the tooth, imparting a higher chroma.
- Enamel translucency and transparency should be most evident at the incisal portion of the tooth, imparting a lower value.
- Select the dentin shade to be 1-2 shades darker than the cervical shade of the tooth.
- Select the enamel shade from the incisal 1/3 of the tooth to be restored or from adjacent teeth.
- Use opaque shades to block light transmission, mask dark areas of the tooth, and lighten the tooth (increase value).
- Tints increase translucency, help increase coloration, and darken the tooth (decrease value).
- Translucent shades can mimic the edge of teeth in between mamelons where enamel is naturally thickest.
- If a dentin shade appears too dark during placement, it may be modified in the next incremental layer by using a lighter dentin body shade or a lighter enamel shade.
- Follow anatomy such as cusps, grooves and pits in the layering process when adding incremental layers, similar to rebuilding dentin and enamel.
- Some clinicians advocate the use of similarly shaded dentin and enamel composites for layering. This technique may eliminate the variability associated with different thicknesses of the dentin and enamel shades.
- Color modifying kits for special characterization are available from several manufacturers (***Biscolor/Bisco, Kolor + Plus/SDS/Kerr, Tetric Color/Ivoclar Vivadent, Creative Color/Cosmedent***). ■