

New Flowable Resins: Good, Bad, or just Hype? (Continued from page 1)

Comparison Chart (Continued)

* Flow is an important factor of handling, but is highly dependent on desired use.

† Flowable wear data was compiled from multiple sources in literature; wear ratings for conventional composite controls are based on CR long-term clinical data.

‡ High polymerization stress can cause cracking in tooth structure upon light cure, due to resin shrinkage. Stress values for flowable composites have improved from previous versions.

§ Although all products listed meet the ISO 4049 criterion of flexural strength for occlusal use (≥ 80 MPa), other criteria are necessary for clinical success.

** Moderate-intensity halogen curing light with manufacturer-recommended cure times; LED fast light for 3 seconds (VALO by Ultradent). Measurements taken at immediate conclusion of light cure. A2 shade used for depth of cure testing.

†† Plus an additional 90¢ per tip used for wasted material from dual-cartridge mixing. Necessary reusable dispensing gun is \$125.

‡‡ Other viscosities of same brand also available; most popular viscosity was evaluated.

§§ HyperFIL (dual-cure) auto-polymerizes to any depth within 2–4 minutes.

*** Marked boxes may have exceptions based on clinical case; see product instructions.

Clinical Tips

• **Use flowables conservatively.** Most common use is as a base or liner beneath conventional composite; however, resin-modified glass ionomer (RMGI) liner (examples: 3M Vitrebond, GC Fuji Lining LC) is preferred by many clinicians because of its numerous advantages, including extended fluoride release and no need for bonding agent before placement.

• **Additional uses for flowables** include: easy adaptation into intricate irregularities or retentive features, and to potentially provide some flexibility in the restoration.

• **Do not use flowables in high-stress areas.** Although some manufacturers currently promote use of their flowable product for occlusal locations, past research shows flowables in general to be unacceptable for this clinical situation and further research is needed.

• **Low polymerization stress** continues to be the most important performance criterion of flowable composites, with acceptable radiopacity, low occurrence of voids, and low flexural modulus (for non-occlusal surfaces) also being of interest.

• **Use an explorer to help composite flow into tight crevices.** Wetting every surface in a deep or hard-to-reach cavity can decrease the risk of subsequent caries.

• **Flowables, used after placement of an appropriate bonding agent, can help decrease tooth sensitivity when used as a liner;** RMGI liner can have a similar effect.

• **To increase flow of conventional composites,** heat prior to placement by either:
1) allowing thin layer to sit on tooth structure for a few seconds to absorb body heat, or
2) heating in a compule heater unit (example: CalSet by AdDent Inc.), before shaping of the composite.

• **Incremental filling is still recommended** for preps deeper than 2 mm, since bulk filling can cause issues in many instances and most lights are incapable of adequately curing deep areas. See *Clinicians Report* January 2012 for more information on this topic.

• **Flowable composites generally have fewer voids** than conventional composites.

CR Conclusions:

- Clinicians should use flowable composites conservatively (e.g., liner/base, non-stress locations), pending additional research.
- Although manufacturers may advertise more demanding indications, newer flowables (including those with higher filler content) do not presently appear to provide a significant improvement over the previous flowable generation.
- The key property of wear (necessary for occlusal indications) continues to be a weakness of some flowable composites, despite their generally acceptable shrinkage and flexural properties (see chart above).
- Flowable advantages of low viscosity and potentially better margin adaptation do not outweigh long-term clinical success of direct restorations afforded by proven conventional composites.
- CR will continue to monitor long-term clinical success of flowable composites for the suggested expanded uses.

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