So, this is a bit tricky to describe without a photo, but I'm really getting frustrated with my composite resin finishing and polishing.

I’ve watched all of the CE online here on Dentaltown about composite placement, and these guys are amazing! I’ve really been trying to be meticulous and particular with my composite resin placement technique, layering, etc., but I’m still getting the “white line” around my margins of my resins! Not always (which is more frustrating, as I’m not sure what I’m doing right), but quite often.

Especially on the occlusal surfaces of Class 1s and 2s, and sometimes on the marginal outline of Class 3s (really frustrating). I’m beveling all my margins fairly significantly, I’m placing in 2-3mm increments (at most) and I’m doing my best to avoid rotary trimming of the margins, although I do admit that I still do a lot of rotary trimming (I’m just not as good at resin manipulation as Jason Smithson or some of the other guys).

So what causes the white lines around the margins of these resins? The margins are smooth, and don’t have any lips, gaps or skips at all… they just don’t look like an even, nice transition between tooth and resin.

Do I not thin my bond enough? Is my bevel not significant enough? Is it broken enamel rods from too much rotary trimming? Is it something to do with the resin placement and subsequent shrinkage on polymerizing? I’m baffled and frustrated. I’m currently using Grandio hybrid composite (VOCO), and I’m reasonably happy with it. Using OptiBond Solo Plus with total-etch technique. I’m polishing/trimming with fine diamonds and using PoGo cups for polishing. Please give me some idea what’s wrong with me! Thanks. ■

It’s the placement of the last increment where the enamel bond is the strongest and the curing technique for this increment.

The white line is a micro gap of detached enamel due to the bond of composite and shrinkage.

The more walls of enamel you are curing to at one time increases this chance.

Tell us about your curing technique and what you are using to cure. ■

OK, that might make sense. I’m probably placing the last increment on the entire surface (in the case of a Class 1) at once, and then curing. I really didn’t realize that was contra-indicated. Hmm… my curing technique consists of waking up my assistant from her day dreaming and getting her to put the light in the vicinity of the tooth (it’s a struggle to say the least). I’m curing from the direct occlusal, then buccal, then lingual (in the case of Class 1). A total of 20 seconds cure time: 10 seconds occlusal, five seconds buccal, then five seconds lingual (then cure again all surfaces).
So you figure this is a shrinkage thing… so does that mean that I should do half of the prep at a time, i.e. buccal first and then lingual next to prevent total shrinkage? So you go fossa to cusp on the buccal, and then repeat on the lingual?

I never really thought this was the case. I was leaning toward the rotary finishing breaking the enamel rods and leaving the line. Thanks. ■ jamie

OCT 3 2011

After I started chamfering my margins instead of beveling them all of the white lines disappeared. ■

OCT 4 2011

Are you separately etching the enamel before placing OptiBond Solo? I don’t remember but is that a total-etch or self-etch? If it is self-etch, you really need to etch the enamel separately. I use OptiBond FL which is total-etch, then primer then adhesive and I don’t remember the last time I had a white line and believe me, I have to adjust the occlusion after curing. The advice on only doing the buccal cusps or the lingual cusp is good, but even better than both MB (mesial buccal) and ML (mesial lingual) cusps at the same time is to do only one cusp at a time. It takes longer but your results will be better. ■ Nathan

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I saw a presentation by Frank White, DDS, in College Station, Texas, about seven years ago. He was using the local university electron microscope investigating the white line occurrences. What he found was that the above protocol given works well. His was one second then three minutes final cure, with adjusting/polishing in between.

He had some really interesting slides showing the enamel separation occurring with a full cure and not occurring using the incremental curing protocol. The more enamel walls and the larger the composite increment, the higher chance for separation with a full cure.

I am young and still able to be shaped. I see these white lines often. I would love to have amazing composites like Jason Smithson.

What I am wondering is, how wrong is my composite protocol? I almost never rubber dam. If I can get a wedge and band to “seal” the apical of the gingival box I feel that with cotton rolls, dry angles and an assistant I have moisture control. I place a little flowable in the box then packable and I use a composite instrument to build up half of the box (buccal or lingual wall) and half the prep, same wall. Cure, then repeat on other wall. Then fill in the middle. On larger preps it might take even more than that. I try to never cure more than 2mm at a time. I do not bevel enamel in the posterior. I will acid-etch enamel for 30 seconds when there is still a lot of enamel. I use Clearfil SE, Esthet-X Flow flowable and TPH3 composite.

I’m going to start to bevel enamel in the posterior and try the pulse cure for the final layer. Any other suggestions?

Start by using a rubber dam.
You think you have moisture control.
You don’t.
Seriously, no excuse not to rubber dam.

Also, don’t forget to harden the filling after it’s all done – rinse, dry, cover with something like KY Jelly and cure for at least 20 seconds on all sides. My staff puts the KY Jelly in syringes for easy application using composite flowable tips.

The science: The last layer of composite never reaches full hardness when exposed to oxygen – this is why you can layer fillings – there’s an uncured layer on the top layer. This uncured layer also picks up stain and dulls quickly, amongst other things. Also, after hardening, it’s tougher to add a new layer, so don’t harden until you’re done adding.