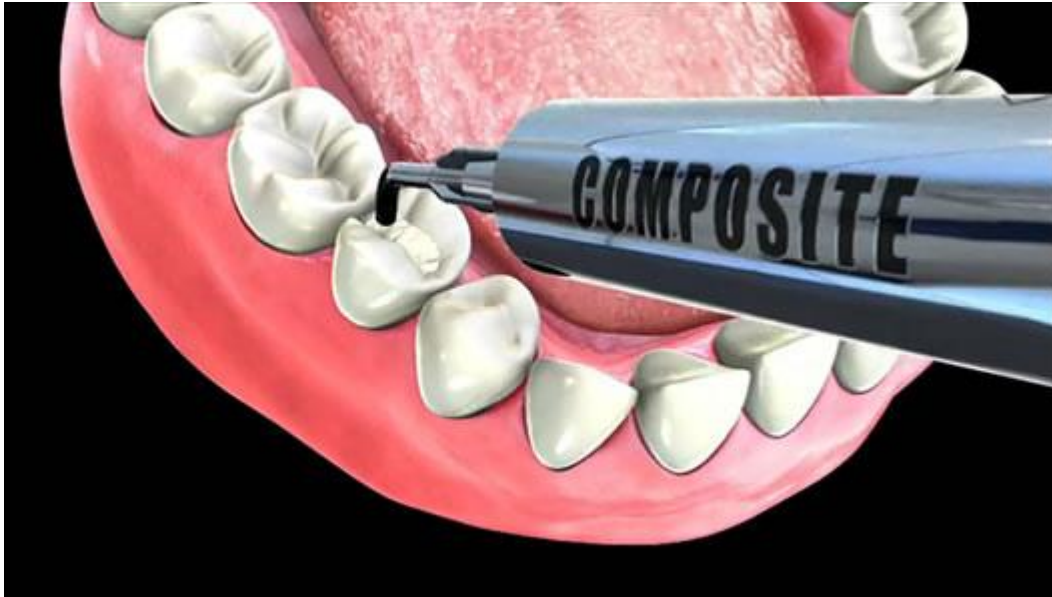




Color change is a major concern when working with these composite resins and has become one of the major reasons for replacing restorations over time. Image Source: Flickr' user Azure Dental

Last weekend we attended an epic barbeque, complete with food, drinks, and outdoor recreation which included a 100-foot giant slip n' slide. Although the highlight of the afternoon was our group volleyball game of husbands vs. wives. I am happy to say that it was a fairly competitive game and we ended up two for two by the end of the evening. However, although I love playing volleyball, stepping out onto the court instantly brought back PTSD symptoms of my middle school years. Let just say that during my early playing days, the gym floor and I got a little too personal and met face to face. The floor won and I ended up with two little stubs of front teeth to show for it. The evidence is still visible today and each time I smile I am a little self-conscious of the color difference between my natural teeth and the composite material. Apparently dental technology was not up to par 20 years ago and the color stability of dental composite resin often deteriorated over time. Dental composites today are much more advanced and color measurement technology ensures that tooth color resins meet quality standards for appearance and longevity.



Composite

resins must be carefully analyzed to ensure accurate color matching, longevity, and stability. Image Source: Flickr' user Ida Aguilar D.D.S.

Monitoring Color Stability with Spectral Technology

Composite resins are commonly used restorative materials in esthetic dental procedures due to their superior ability to adhere to enamel and dentin. Unfortunately, color change presents a major challenge when working with these materials and has become one of the major reasons for replacing restorations over time.¹ There are many factors that affect the color stability of composite resins and these materials must be carefully analyzed to ensure accurate color matching, longevity, and stability.

Portable spectrophotometers offer the advanced technology needed to monitor the color stability of dental composite resin and are a commonly used tool in dental laboratories and offices. This instrumentation utilizes the CIE Lab system for classifying and correlating color numerically, with the ability to calculate the difference between two colors using a standardized color formulation. Measuring the reflection of the resin with an optical geometry of $d/8^\circ$ gives a spectral curve in the visible frequency range of 400-700nm². By honing in on this detailed information, laboratory technicians can then modify their formulations to improve the color matching and stability of their resins and use this data to monitor changes over time.



Spectrophotometers are important tools for color matching and are used by both laboratory and dental technicians. Image Source: Flickr' user The Tooth Station

Addressing Challenges of Color-Matching

[Color matching](#) is one of the most important characteristics of esthetic dental composite resins. However, color matching of natural tooth enamel presents one of the greatest challenges in clinical dentistry. Exact color matching and reproduction is critical in composite tooth restorations and requires quantifiable data. The human eye alone cannot consistently identify tooth color and various light sources can alter the perception of tooth color. In order to obtain objective color measurements of natural tooth enamel and composite resin materials, spectrophotometric technology must be implemented both in the dental office and throughout laboratory processing.

Creating an accurate analysis of tooth color requires multiple readings and data to create an average sample measurement. [Averaging color](#) helps to ensure that a perfect enamel match is obtained and that the resin color falls within the acceptable parameter. Because resins vary in consistency and thickness, using the right spectrophotometric techniques and creating an average sample reading makes accurate resin color analysis simple. [Spherical spectrophotometric technology](#) accounts for variations in thickness and texture ensuring accurate color measurement every time.

The Right Instrumentation for Quality

From the dental chair to the laboratory and back to the patient again, color stability of dental composite resin requires advanced color measurement tools for quality materials and happy clients. Using the same instrumentation throughout these processes ensures that data and color matching remain consistent, reducing the chance of variations over time. HunterLab spectrophotometers utilize the latest color measurement technology and provide satisfying results in dental resin color

analysis. Our instrumentation is easily calibrated to maintain agreement between the various stages of tooth restoration, and the unique design of our color measurement tools allow for adaptability within this industry. To find out more about the HunterLab commitment to color measurement and our unique customer support promise, [contact us today](#).

1. "Enamel Susceptibility to Coffee and Red Wine Staining at Different Intervals Elapsed from Bleaching: A Photoreflectance Spectrophotometry Analysis", October 17, 2010, <http://online.liebertpub.com/doi/abs/10.1089/pho.2009.2627?src=recsys&journalCode=pho>
2. "Repeatability of Colour Reading With a Clinical and a Laboratory Spectrophotometer", September/October 2006, http://www.moderndentistrymedia.com/sept_oct_2006/corciolani.pdf