The New Universal Composite:
One shade for every patient

BY TERRI LIVELY
Composites are a vital and useful tool in the dental practice. Not only do they facilitate excellent restorations, but they also look just like the natural tooth when the final restoration is complete.

That is, composite restorations look natural after a concentrated effort to match the patient’s natural teeth to one of the shades in the guide, in the optimal environmental lighting and interior design. Plus, you must have the right shade of the proper category of the composite in inventory — that hasn’t expired. Or maybe the composite restoration looks natural because of your finesse, time and care with shade blending to get that unique hue your patient presents.

In other words, composite restorations look fantastic, but shade matching is a time-consuming process.

Or, rather, it was a time-consuming process. Tokuyama Dental's OMNICHROMA can improve your practice efficiencies and clinical outcomes with new technology for shade matching. OMNICHROMA is a single-shade, structurally-colored universal composite designed to match every tooth shade with a single shade of composite. OMNICHROMA is the first and only composite to use one shade to match the entire VITA Classical Shade Guide, from A1 to D4.

In this eBook, you'll learn more about this revolutionary product. We’ll share how OMNICHROMA’s unique design and features allow it to match the 16 VITA classical shades with only one shade of composite. You’ll also learn how it eliminates the need for shade selecting. Furthermore, you’ll see how it reduces the composite inventory needed, so you have fewer wasted materials that expire before they can be used. Finally, we had 25 doctors rate OMNICHROMA’s performance on nearly 1,000 restorative cases and we’ll share what they had to say about its performance.

But first, let's take a closer look at composites in general.
A QUICK OVERVIEW OF COMPOSITES

Composite resins were designed for esthetics. Tooth-colored by design, they replace healthy tooth structure for restorations and serve all the same biological and functional jobs as a natural tooth would. Many times, after the composite resin restoration is complete, one can’t tell the tooth ever had a cavity — if it’s done well. But at the same time, it can be difficult and time-consuming to attain a perfect esthetic match.

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Composites have been around since the 1960s. However, the first materials weren’t durable enough for the work surfaces of the posterior teeth. Today’s composites have addressed the strength and durability issues of the early materials.

There are a few different types of composites, including:

- **Macrofills**: Macrofills were the first composites. They had large particles, from 10-15 micrometers, and were strong but not esthetic. The large size of the fillers made them difficult to finish and polish. For all of these reasons, they’re no longer commonly used.

- **Microfills**: Following the macrofills were the microfills. They had smaller particles, in the range of 0.03 to 0.05 micrometers. They looked better than macrofills, but they were weak and not suited to posterior restorations. Microfills are still in use for certain restorations today.

- **Hybrids**: When you combine the strength of a macrofill with the esthetics of a microfill, you get the hybrid composites. The sizes of the particles are different as a result of the combination of macrofills and microfills. Many of the composites clinicians use today are in this category.

- **Nanocomposites**: The latest composites are called nanocomposites. The particle size is as small as 20nm. However, the small particles form nanoclusters, which are groupings of smaller particles that function as a larger particle. The nanoclusters allow the nanocomposites to enjoy more strength and durability but still look great. There are also nanofilled resins and nano-hybrids. There are a few of these products available today.

Composites also have different product categories, which include:

- **Universals**: As the name implies, universal composites are designed to be used anywhere in the mouth and produce long-lasting and natural-looking dental restorations.

- **Flowables**: Flowables have more fluidity to their composition and are mostly used for smaller restorations and as liners and bases.

- **Bulk fills**: Unlike the other two product categories of composites, bulk fills can be layered thicker in preparations with less curing. Many times, bulk fills are used for posterior restorations, but the use of bulk fills is always evolving as materials improve.

Universals are the most versatile of the three product categories. When it comes to universal composite performance, there are a few characteristics clinicians should consider.

- **Strength**: How will it hold up when the patient is using compressive force?
• **Esthetics:** Will the composite match the patient’s other teeth?

• **Shrinkage:** Will it shrink during polymerization and create problems for the patient long-term?

• **Polishability:** Will the restoration maintain its luster and have a life-like appearance?

• **Handling:** Do you like how it feels to work with and can you produce the results you want with the material?

Composites aren’t perfect, however. Some composite types lack durability and have low flexural strength. Others have poor wear resistance. Some clinicians think composite materials systems could be simpler to use. Others feel like the esthetics could still be improved more, including the shades of composite available.

Materials are constantly improving. Furthermore, not all composites are created equal — and we mean that in the literal sense. Knowing your product, what its strengths and limitations are, and which type of cases you have the most success with that product is key to avoiding some of these challenges.

However, there’s an area of opportunity. Most composites have tried tackling or have tackled this opportunity by having good shade matching abilities (i.e., chameleon effects, etc.), but none so far have perfected it to result in a one-shade composite that works for every shade of tooth. Let’s take a closer look at shade matching in more detail.

**THE CHALLENGES OF SHADE MATCHING**

Many challenges exist with shade matching teeth. Some difficulties arise based on the operatory, while others happen as a result of the materials. Still others stem from the processes clinicians use — or don’t use.

Also, dentists must consider many things when matching materials to a patient’s natural teeth, including shape, contour, texture and luster. It takes time to analyze all these factors. Let’s look at some of the challenges with getting the shade right.

**OPERATORY FACTORS**

• **Lighting:** Poor quality lighting will make a significant difference in the perception of tooth shade.

• **Interior design:** The colors of the walls, cabinetry, and furniture items, like the dental chair upholstery, influence what you see for the shade of the teeth.

• **Lack of proper tools:** Technology like Opto-electronics that detect and control light in its visible and invisible forms can enhance the shade-matching process; however, not every office has invested in this technology.

**SHADE GUIDE FACTORS**

• **Comparing the tooth with a classic shade guide:** Classic shade guides have subjectivity to them. Experts say that digital guides are more objective than traditional shade guides.

• **Using an old shade guide:** Over time, the cleaning products we use will change the colors on the shade guide. Not replacing shade guides means that the colors will fade in time and create problems with accurate shade matching.

• **Not comparing and contrasting:** If you only use one type of shade matching, you have only one resulting match. When you use more than one way to shade match, whether that is a different manufacturer’s shade guide or an electronic version, like a colorimeter or spectrophotometer, you have confirmation, or at the very least, more information about the shade.

**PROCESS FACTORS:**

• **Skipping the picture:** If you don’t take pictures (which takes time), you could be missing essential tools for patient education. Moreover, pictures help you communicate and collaborate
with the lab, where your technician can help create a better match than the clinician alone.

• **Shade matching at the wrong time:** If you’re tired, your eyes don’t catch the same amount of detail. If your patient has been in the chair for a while, his or her teeth are drier than usual. Shade matching at the beginning of the appointment can be more successful than shade matching at the end.

• **Eyesight problems:** Perception depends on optical health; if the viewer has deficiencies, it can affect the shade matching.

• **Mixing and matching materials:** All the systems have variance; mixing and matching materials and using materials in multiple layers can change the final result and affect the shade match success.

All these factors can affect the quality of the shade match. With all these variables, it can be a time-consuming process with many opportunities to go awry.

However, composites are always improving. OMNICHROMA has addressed the shade matching challenge in a whole new way.

**WHAT’S NEW IN UNIVERSAL COMPOSITES?**

OMNICHROMA is a new universal composite by Tokuyama Dental that matches the entire VITA Classical Shade Guide, from A1 to D4, with just one shade of composite. It was designed with new technology for shade matching.

Most composites rely on dyes and pigments to match specific shades. Successful matches require selecting the exact shade to get the match. However, composites with added dyes and pigments are limited in their shade-matching ability.

OMNICHROMA doesn’t use pigments or dyes to create color. Rather, OMNICHROMA comes in one shade that matches every patient’s natural teeth using structural color.

**WHAT IS STRUCTURAL COLOR?**

Structural color doesn’t rely on added pigments or dyes to color match but instead uses a combination of the visible light and how it interacts with a physical object to create the color you see. Structural color is expressed by the physical properties of light working together with nanostructures.

Nanostructures are tiny objects that range in size between microscopic and molecular-sized. Nanostructures improve reactivity, meaning they have quantum effects on what we see at a larger scale. In other words, nanostructures are so small that they interact with light differently than particles on the visible scale. This varied interaction means that we see colors differently than we would when light interacts with larger particles.

Some color we see is created by the reflection of light through these tiny, physical structures and can change the color we see depending on our angle of view. Examples of this type of structural color occurring in nature are iridescent bird feathers, beetles’ backs and butterfly wings. For example, the morpho butterfly’s wing reflects a blue light and is therefore visible as blue.

Unlike the blue of the morpho butterfly, the color of natural teeth fall in the range of red-to-yellow color. When the light interacts with OMNICHROMA in the tooth, the composite creates the red-to-
yellow structural color we see reflected back. Our eye perceives that the composite matches the surrounding tooth, whether that tooth is A1 or D4 on the VITA Classical shade guide.

**PARTICLE SIZE MATTERS WHEN IT COMES TO STRUCTURAL COLOR**

OMNICHROMA can create structural color because of its unique filler size and how it's produced. Filler size is a vital factor in composites, as it affects the physical and esthetic characteristics of the restoration.

You’ll recall that macrofills are generally strong but not esthetic and microfills are esthetic but weak. Most of the composites today are hybrid fills, with a mix of large and small particles. Some new composites are nanohybrids, which take the tiny particles and combine them into larger clusters, so they have the strength of larger hybrids.

Whether a hybrid or a nanohybrid, most composites are crushed glass materials that are milled to a particular size. However, the size and shape of the particles aren’t uniform.

OMNICHROMA is a supra-nano filled composite that has uniform particle size. The particles are uniform because it’s manufactured using the Sol-Gel Method. In the Sol-Gel Method process, the fillers are grown in an organic solvent rather than milled from glass particles. This process allows the fillers to develop in a spherical shape and maintain a uniform size.

The uniformly sized fillers in OMNICHROMA generate the red-to-yellow structural color which matches the color elements of a natural tooth, the first composite to accomplish that. Using the red-to-yellow structural color and combining it with reflected light and the color of the surrounding teeth, OMNICHROMA generates and matches the tooth color — no matter what shade it is.

**SIMPLIFYING SHADE MATCHING PROVIDES UNIQUE BENEFITS**

OMNICHROMA’s unique shade matching approach has many other benefits to a dental practice, too. In addition to matching whatever shade the patient presents, it also reduces chair time on a procedure.

Doctors no longer have to hold up a shade guide next to a patient’s tooth to match a shade. Moreover, it’s no longer necessary to use multiple shades to get the desired effect for all the patients whose teeth don’t have a perfect match with one of the shades. Since OMNICHROMA uses the surrounding tooth color in its structural color process, it streamlines the shade matching process by reducing the chairside time and eliminating the need for artistic finesse that shade-matching other composites sometimes requires.

Furthermore, with OMNICHROMA, a practice needs fewer products on the shelf. With the present system for composites, doctors have to maintain inventory for all these composite shades from A1 to D4 and beyond. All of the shades have expiration dates. When you have shades that you don’t use often, you might buy them and then never use them before they expire. When you have one composite on the shelf that matches all teeth, you don’t need all the incidental shades in inventory. As a result, the practice throws out less composite that would typically expire because of being rarely used.

Benefits are great, but results are better. Let’s see how OMNICHROMA performed in actual cases.

**HOW OMNICHROMA PERFORMED IN TESTING**

We asked 25 doctors to evaluate OMNICHROMA, which they did in 841 restorative cases. The cases covered the gamut of tooth shades and restoration classes, ranging from small Class I cases to large and complex Class IV cases.

The doctors rated the new universal composite on color matching, polishability, stability under ambient light and handling. Their options were Excellent, Good, Average, Fair, Poor and No Response.

Here’s what they found.
• **Color Matching:** Ninety-two percent rated it either excellent or good (60.8 percent and 31.9 percent, respectively).

• **Polishability:** Ninety-two percent rated it either excellent or good (60 percent and 32 percent, respectively).

• **Stability Under Ambient Light:** Ninety-two percent rated it either excellent or good (44 percent and 48 percent, respectively).

Finding ways to work smarter without compromising patient care is a significant factor in boosting revenue for the practice. Simplifying the shade matching process is an example of innovations in universal composites that can help improve practice efficiencies.

• **Handling:** Ninety-six percent rated it either excellent or good (52 percent and 44 percent, respectively)

Very few respondents recorded average or below average responses. Color Matching had 52 cases that were rated as average (6.2 percent), seven cases were below average (0.8 percent), and three cases were unknown (0.4 percent). For Polishability and Stability Under Ambient Light, eight percent had no response. For Handling, respondents rated four percent of the cases as average.

With few exceptions, OMNICHROMA matched the natural shade of teeth for every restorative class. These clinical outcomes result from the technology and innovation behind the material.

**HOW DOES OMNICHROMA IMPROVE PRACTICE EFFICIENCIES?**

In a dental practice, time is money. Finding ways to work smarter without compromising patient care is a significant factor in boosting revenue for the practice. Simplifying the shade matching process is an example of innovations in universal composites that can help improve practice efficiencies.

For example, OMNICHROMA’s shade matching ability means you can skip some of the shade selecting chairside with patients. That sounds great, but what does that mean in practical terms in a day-to-day perspective?

We spoke to 141 dental professionals to get an idea of what this would mean. The majority of the respondents were dentists with the other respondents in different roles ranging from clinical lead to office manager to hygiene manager and more.

Our survey results show that 52 percent of respondents spend up to 30 to 60 seconds on shade matching per patient.

Let us determine what this means in time. If a doctor sees an average of eight to 12 patients in a day, let’s use 10 patients as our estimate. Ten patients per day adds up to 50 patients in a five-day work week, 200 in a month and 2,400 in a year.

If half of the patients require shade matching for their treatment, a doctor could save 20 hours over the course of a year. If the shade matching drops down to a third of the patients the dentist sees, he or she could save 13 hours. Furthermore, these 30 to 60 seconds are only the initial comparison against the shade guide for the shade matching process. Imagine the amount of time dental professionals could save by not blending shades or adjusting a shade after the initial match.

If there was a way to gain back this time, how could the dental team use it in a practice? They
could use the time to see more patients, including devoting time to treating underserved populations, who aren’t currently getting adequate dental care. Alternatively, the opposite could occur. Doctors and staff could have fewer clinical hours per week to gain back a work-life balance or reduce the day-to-day pace in the office.

Some dental professionals might use it to spend more time with patient education, helping patients understand how oral health care can affect a person’s overall health. Others might use the time to incorporate new technology and health analysis for patients. Some doctors might even invest in more continuing education for themselves or their staff.

All of these investments will improve patient care and boost morale at the dental office. Also, from a business perspective, the time saved could result in more revenue-generating activities for the practice.

**HOW OMNICHROMA RESULTS IN COST SAVINGS**

The survey of 141 dental professionals also suggested cost savings for a practice that uses OMNICHROMA. Let’s take a look at how they manage their material inventory now.

Survey results show 47 percent of respondents throw away up to five percent of their composite inventory because it expires on the shelf. Twenty percent said they dispose of up to 10 percent. Another seven percent of the respondents said they throw out up to 15 percent. One practice said they throw out up to 30 percent of their composite inventory because it expires.

The composite expiring on the shelf is usually a shade the practice doesn’t use often. Sixty percent of respondents said this was the case for their practice. However, 25 percent said it was due to poor organization and nearly 13 percent said it was because the material has never been swapped out for another.

Furthermore, most of the respondents (90 percent) have from one to four brands of a composite in their inventory. The two most significant reasons given for having multiple brands were handling capabilities (63 percent) and esthetic outcomes of specific procedures with a particular product (66 percent). Some said they like to try the newest composites (11 percent). A few respondents said they like variety in their composite materials (9 percent).

However, with OMNICHROMA, one composite shade adapts to any tooth shade. Dentists can use this universal composite for multiple patients and almost all cases. It will not only reduce excess inventory but also cut costs for the dental practice because they don’t have to stock all the shades.

Also, there’s much less of a chance of the composite expiring on the shelf. Many practices employ a “first in, first out” strategy with composites. Composites in the less frequently used shades might not ever get used before they expire. However, since OMNICHROMA can be used in so many cases, it won’t have a chance to expire on the shelf.

OMNICHROMA’s unique design and features match the 16 VITA classical shades with only one shade of composite. Not only that, it eliminates the need for chairside shade taking, which increases your productivity and improves your patient experience.

Also, the one-shade composite eliminates the need to stock all the composite inventory you currently need on the shelf. It means you could have fewer wasted materials (and wasted material budget) from composites that expire before you can use them.

We also heard what doctors had to say about how OMNICHROMA delivered excellent results on nearly 1,000 restorations. In almost every case, OMNICHROMA received top marks for its performance.

Composites are versatile dental materials in today’s dental practice. Finding ways to make
them more efficient and easier to use are vital to today's dental professionals.

Tokuyama Dental’s OMNICROMA is an innovative product that improves patient outcomes and practice efficiencies. It is truly one shade for every patient.

Would you like to learn more about the science behind OMNICROMA? Visit Omnichroma.com/US or www.tokuyama-us.com to learn more and request a sample.

SOURCES


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