

3M™ Filtek™ Easy Match Universal Restorative

Technical Product Profile



Table of Contents

| | |
|---|-----------|
| Introduction..... | 3 |
| Product Description..... | 4 |
| Indications for Use..... | 4 |
| Product Features | 4 |
| Composition of 3M™ Filtek™ Easy Match Universal Restorative | 4 |
| Intuitive Shade Selection..... | 5 |
| Naturally-Adaptive Opacity..... | 6 |
| Radiopacity | 7 |
| Background Information | 8 |
| Nanotechnology | 8 |
| Resin System..... | 9 |
| Performance..... | 10 |
| Polish Retention | 10 |
| Wear Resistance..... | 12 |
| Strength..... | 13 |
| Shrinkage | 17 |
| Customer Acceptance Test | 18 |
| Quick Start Guide | 20 |
| Property Comparison Table..... | 20 |

Introduction

Clinicians around the world choose 3M™ Filtek™ Dental Restoratives for their performance and handling, and for their ability to create natural-looking smiles. They have been proven in more than 2 billion restorations globally since first introduced in the 1980s.

Building on dentists' insight and our clinically proven nanotechnologies, we created 3M™ Filtek™ Easy Match Universal Restorative.

For many years, there has been a trend among dentists towards shade reduction, which we have picked up on with the launch of our Filtek Universal Restorative Composite. However, some dentists wanted an even more simplified shade selection, which should still meet the esthetic requirements in the anterior and posterior region.

Introducing Solventum's proprietary use of nanofillers, pigments and opaquer that harmonize to create a balanced opacity.

Filtek Easy Match Universal Restorative is derived from our clinically and academically proven leading nanofilled Filtek composites. The harmonization of nanofillers, pigments and opaquer create a balanced opacity which, when applied to the Bright, Natural and Warm shades, creates a pronounced blending effect with surrounding structures. Naturally-adaptive opacity ensures that an Enamel-like translucency is achieved in clinically relevant thicknesses of 0.5-1 mm, on the beveled margin and on the incisal edge of anterior restorations. Research conducted by Solventum as well as at the University of Texas shows pronounced blending abilities, with balanced opacity, eliminating the need for an additional blocker.

2002

3M™ Filtek™ Supreme Restorative

The first true nanocomposite

2005

3M™ Filtek™ Supreme Plus Universal Restorative

Advancements include:

- Optimized shades to provide more vibrant, lifelike restorations

2010

3M™ Filtek™ Supreme Ultra Universal Restorative

Advancements include:

- Easier to-use shading system
- Better polish retention
- Improved fluorescence
- Supreme-like handling
- Improved translucent shades

2019

3M™ Filtek™ Universal Restorative

Advancements include:

- Simplified shading system with NaturalMatch technology
- A universal opacity
- An improved Extra White
- First Filtek™ restorative with Pink Opaquer
- Low-stress monomers in a universal composite

2024

3M™ Filtek™ Easy Match Universal Restorative

Advancements include:

- 3-shade system with intuitive shade selection
- Naturally-adaptive opacity

Product Description

3M™ Filtek™ Easy Match Universal Restorative is a visible-light activated, radiopaque restorative composite designed for use in anterior and posterior restorations. The three available shades (Bright, Natural, Warm) have a body-like opacity enabling up to 2mm depth of cure. All 3 shades are radiopaque.

Product Features

- 3 shades; Bright, Natural, Warm
- Harmonization of Solventum's proprietary use of nanofillers, pigments and opaquer
- Naturally-adaptive opacity, no blocker required
- Intuitive shade selection – no complicated shade guide needed
- Patented nanofiller technology with excellent polish retention, strength and wear resistance, anterior and posterior
- Available in 0.2g capsules or 4.0g syringes
- Capsules can be warmed up to 158°F (70°C)

Composition of 3M™ Filtek™ Easy Match Universal Restorative

The fillers are a combination of a non-agglomerated/ non-aggregated 20nm silica filler, a non-agglomerated/ non-aggregated 4 to 11 nm zirconia filler and an aggregated zirconia/silica cluster filler (comprised of 20nm silica and 4 to 11nm zirconia particles). Filtek Easy Match Universal Restorative has an average cluster particle size of 0.6 to 10 microns. The inorganic filler loading is 78.5% by wt. (63.3% by volume). Filtek Easy Match Universal Restorative contains Bis-GMA, UDMA, TEGDMA, PEGDMA and Bis-EMA(6) resins.

Filtek Easy Match Universal Restorative is applied to the tooth following use of a methacrylate-based dental adhesive, such as manufactured by Solventum, which permanently bonds the restoration to the tooth structure.

Indications for Use

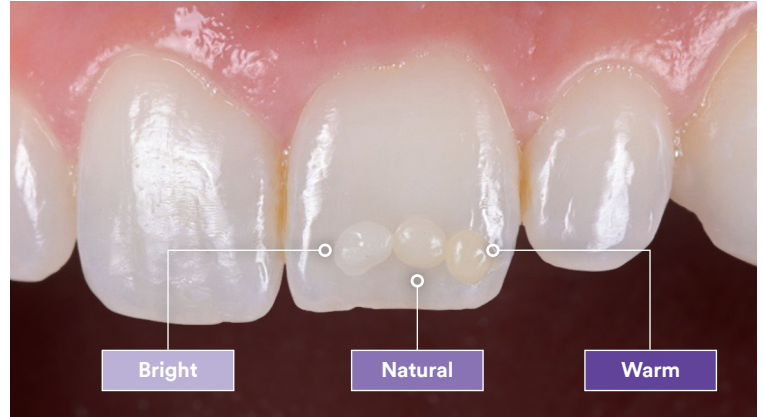
- Direct anterior and posterior restorations (including occlusal surfaces)
- Core buildups



Intuitive Shade Selection

Simplified esthetics and shading

- Just 3 shades (Bright, Natural, Warm) for an excellent match to almost any patient's tooth shade, anterior or posterior
- Single-shade opacity, no blocker needed
- Follow your intuition by observing and selecting from Bright, Natural or Warm – no complicated shade guide needed



Courtesy Dr. Brian Baliwas

How is it possible to match almost every tooth shade with just three shades?

Chroma, or color intensity, is only one of the components leading to a great shade match. Even a composite of the “right color” can stand out from surrounding dentition if its value (relative lightness/darkness) or opacity is not a good match. Together, the 3 shades of 3M™ Filtek™ Easy Match Universal Restorative cover the 16 VITA classical shades – no blocker needed.



Representative example of **Bright** tooth shade.

Bright



CHROMA



VALUE



Representative example of **Natural** tooth shade.

Natural



CHROMA



VALUE



Representative example of **Warm** tooth shade.

Warm



CHROMA



VALUE

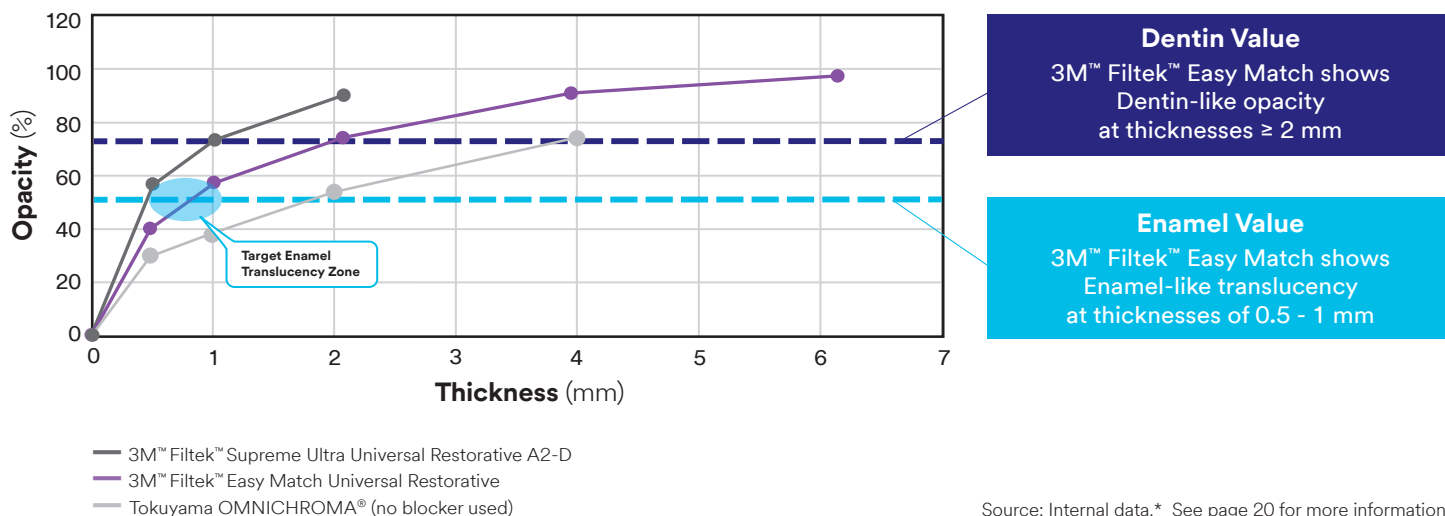


Naturally-Adaptive Opacity

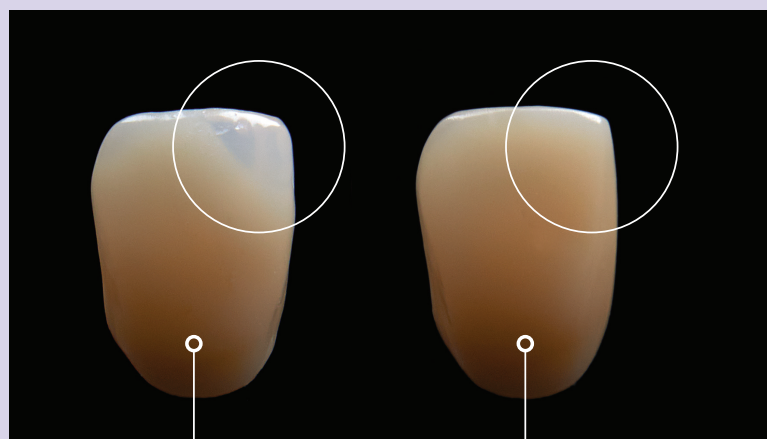
What is “naturally-adaptive opacity” and what enables the “chameleon effect”?

With naturally-adaptive opacity, clinicians achieve Enamel-like translucency in clinically relevant thicknesses of 0.5-1 mm, on the bevel and incisal edge, and Dentin-like opacity at thicknesses greater than 2mm. Solventum’s proprietary use of nanofillers, pigments and opaquer harmonize to create a balanced opacity which, when applied to the Bright, Natural and Warm shades, create a pronounced blending effect with surrounding tooth structures.¹

Inside the science of naturally-adaptive opacity



Opacity comparison of two single-layer restorations



Tokuyama
OMNICHROMA®
No blocker used

3M™ Filtek™ Easy Match Universal
Restorative, Natural Shade
No blocker needed

Some competitive single-shade composites (left tooth in image) achieve dentin-like opacity only at thicknesses of around 4mm and therefore require an opaquer in most anterior restorations.

Source: Internal data.* See page 20 for more information.

But why does this matter?

Enamel-like translucency is required on the incisal edge, where enamel thickness ranges from 1.0–1.3mm, and on the enamel bevel, which has a thickness of 0.5–0.75mm.



Radiopacity

Every dental practitioner leverages the radiopaque effect day in, day out: X-rays are a useful diagnostic tool in dentistry because healthy enamel and dentin offer a certain degree of radiopacity. The effect is caused by hydroxyapatite, or more specifically, the calcium and phosphorous contained in hydroxyapatite, the primary mineral of enamel and dentin. As the hydroxyapatite content is higher in enamel (about 97 percent by weight)², enamel appears brighter (more radiopaque) on radiographs. As the amount of hydroxyapatite is significantly reduced in caries-infected tooth structure due to demineralization, carious lesions appear radiolucent (dark) compared to healthy enamel and dentin. Consequently, they can be distinguished from healthy tooth structure on a radiograph.

Studies in which dentists interpreted radiographs and secondary caries was diagnosed according to a five-point confidence rating show that a semi-radiopaque restoration appears to be advantageous and that the best radiopacity slightly exceeds that of the enamel.³ 3M™ Filtek™ Easy Match Universal Restorative provides a radiopacity of 2.4mm Al, which is slightly higher than the radiopacity of enamel.

¹Ferraris F et al. The International Journal of Esthetic Dentistry 2014, 9(3):382-401.

²Enax J, Eppler M. Synthetic Hydroxyapatite as a Biomimetic Oral Care Agent. Oral Health Prev Dent. 2018; 16(1): 7-19.

³I. Espelid, et. al. Radiopacity of restorations and detection of secondary caries. Dental Materials Volume 7, Issue 2, April 1991, Pages 114-117; 16(1): 7-19.

Background Information

Nanotechnology

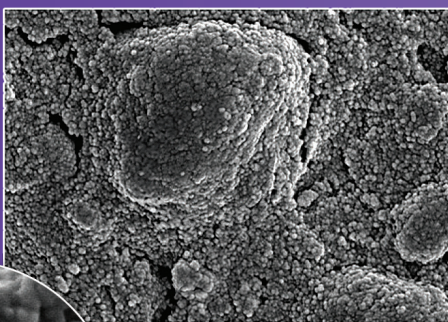
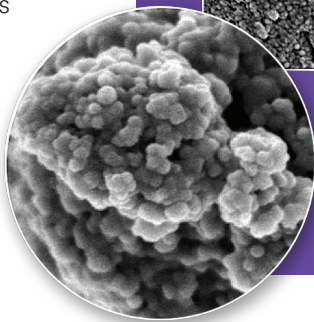
New composites entering the market use different names and confusing terms to describe their technologies. So, it's no surprise then, that two of the most common questions we get asked are:

- What are the differences between a nanocomposite, nanohybrid/microhybrid or microfill?
- Do I get different levels of performance between the different classes of materials?

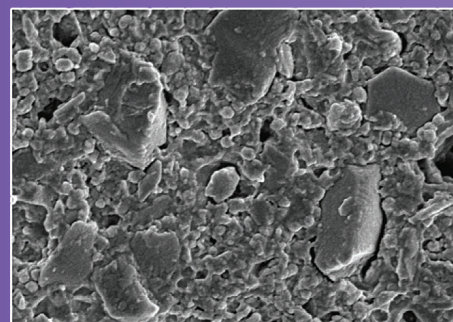
Solventum is the only company in the dental industry that has patented TRUE nanofiller technology, which means we have the only TRUE nanocomposites on the market.

But why does this matter?

The significant distinction between the nanotechnology of our leading 3M™ Filtek™ Dental Restoratives and microhybrids/nanohybrids is that our nanoparticles are uniquely formed from sub-100nm particles and are not the result of a grinding process.



3M™ Filtek™ Easy Match
Universal Restorative
nanocluster at
100Kx magnification



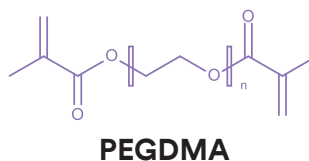
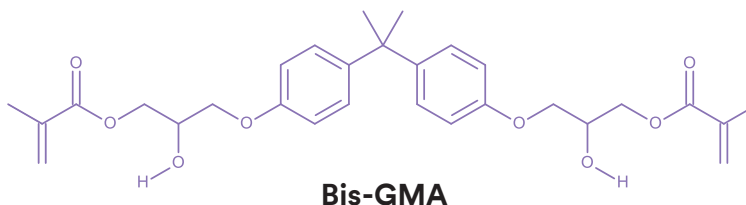
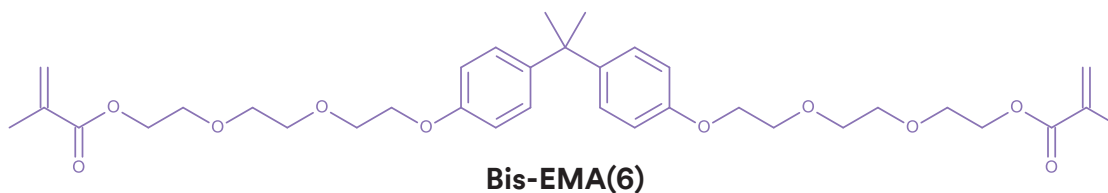
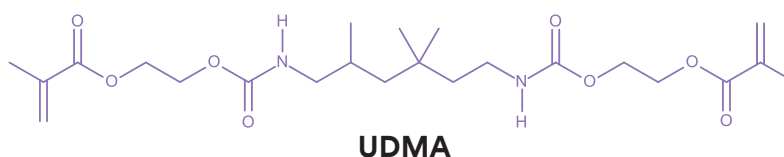
Leading competitive
composite

SEM photos courtesy of Dr. J. Perdigao, University of Minnesota.

Some nanoparticles are fused into nanoclusters which shear at a rate similar to the wear of the surrounding resin matrix during abrasion, such as toothbrush abrasion. That's why restorations made from Filtek Easy Match Universal Restorative maintain a smooth surface gloss for excellent esthetics. Additionally, the nanoclusters are around 1–3 microns in size—a size range similar to fillers found in the hybrid composites. That provides for high filler loading, which results in excellent physical and handling properties.

Resin System

The resin system used in 3M™ Filtek™ Supreme Ultra Universal Restorative is also being used in 3M™ Filtek™ Easy Match Universal Restorative. The resin consists of three major components: UDMA (Urethane dimethacrylate), Bis-EMA(6) (Bisphenol A polyethylene glycol dimethacrylate) and Bis-GMA (Bisphenol A-glycidyl methacrylate) to balance the overall properties. Small amounts of PEGDMA (Polyethylene glycol dimethacrylate) and TEGDMA (Triethylene glycol dimethacrylate) are used to reduce the viscosity of the higher viscosity main monomers.



Monomers used in 3M™ Filtek™ Easy Match Universal Restorative.

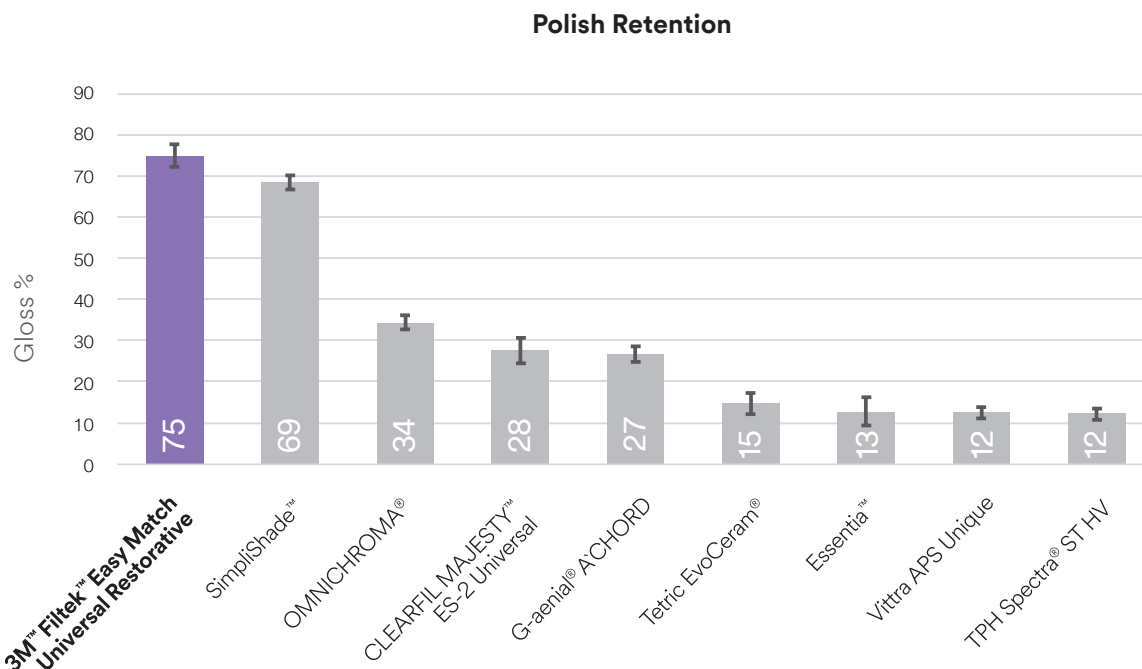
Performance

Polish Retention

When any composite material undergoes abrasion (toothbrushing, chewing, etc.), the resin around the particles is worn. During this wear, the protruding filler particles (bumps) are exposed. Eventually after enough wear and time, the entire filler particle falls away from the surface of the composite, resulting in divots within the material's surface. When a material contains many of these bumps and craters, it creates an uneven, rough surface, which results in the loss of reflectivity (loss of polish) on the composite surface.

Toothbrush Abrasion Test

Composite materials were shaped into tiles and thoroughly cured. The surfaces were polished wet using a Buehler variable-speed grinder-polisher to remove the air-inhibited layer and to ensure a uniform surface. They were stored in water at 37°C (98.6°F) for 24 hours. Gloss was measured at an incidence angle of 60° from the surface normal. The samples were brushed with toothpaste and a toothbrush mounted on an Automatic Toothbrush Machine. Gloss measurements were taken after every 1,500 cycles until the completion of 6,000 toothbrush strokes.



Test results show that the polish retention of 3M™ Filtek™ Easy Match Universal Restorative is statistically better compared to Kerr SimpliShade™, Tokuyama OMNICHROMA®, Kuraray CLEARFIL MAJESTY™ ES-2 Universal, GC G-aenial® A`CHORD, Ivoclar Vivadent Tetric EvoCeram®, GC Essentia™, FGM Vittra APS Unique, and Dentsply Sirona TPH Spectra® ST HV.

After brushing



**3M™ Filtek™ Easy Match
Universal Restorative**



SimpliShade™



OMNICHROMA®



CLEARFIL MAJESTY™
ES-2 Universal



G-aenial® A`CHORD



Tetric EvoCeram®



Essentia™



Vittra APS Unique

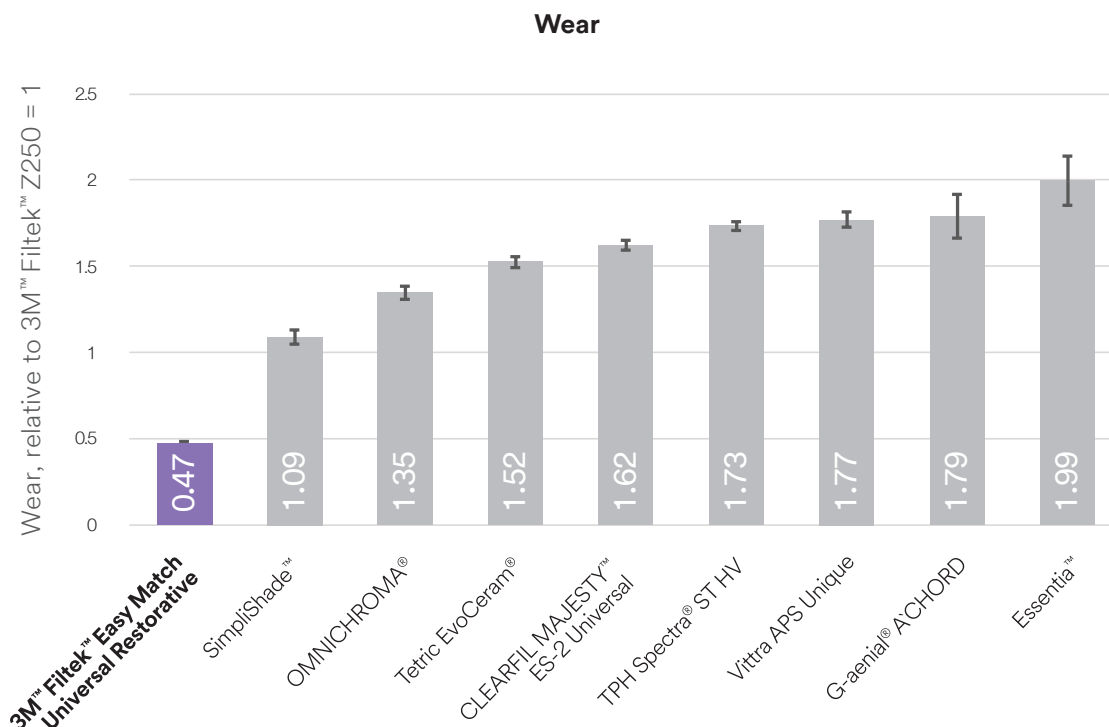
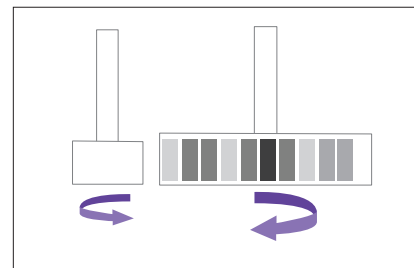


TPH Spectra® ST HV

Wear Resistance

3-Body Wear Test Based on ACTA Methodology

Wear was determined using an in vitro 3-body wear test. In this test, composite (1st body) is loaded onto a wheel, which contacts another wheel, which acts as an “antagonistic cusp” (2nd body). The two wheels counter-rotate against one another, dragging abrasive slurry (3rd body) between them. Dimensional loss (microns) is determined by profilometry at the end of 200,000 cycles.



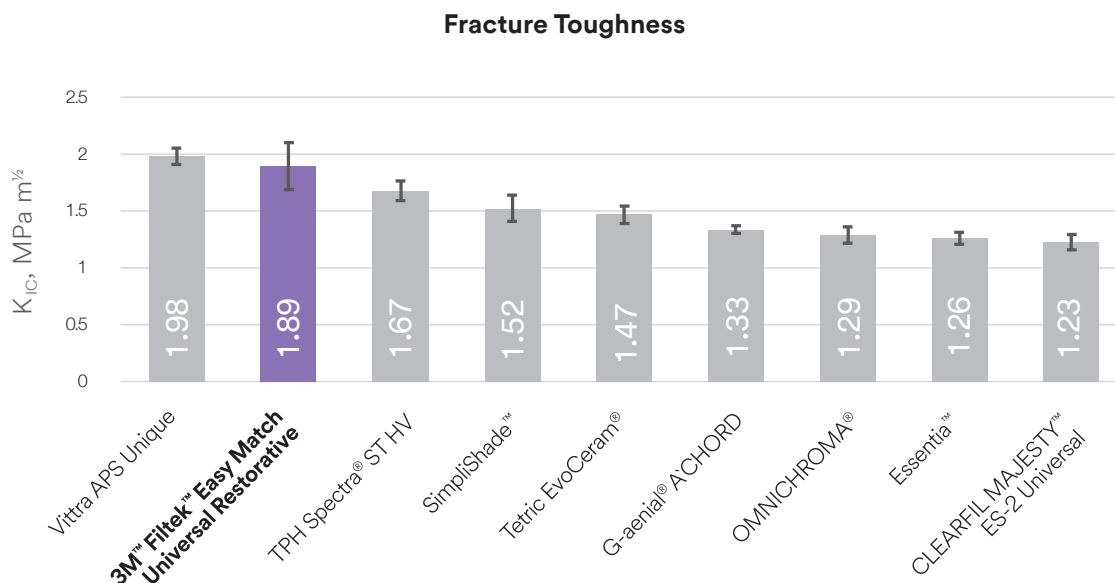
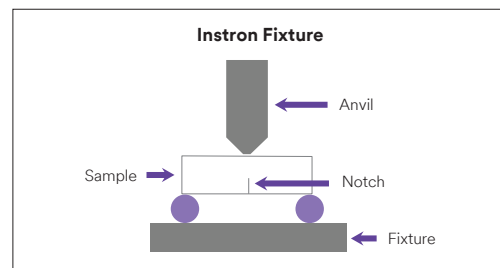
Wear Resistance. Source: Internal data.* See page 20 for more information.

The 3-body in vitro wear test data shows 3M™ Filtek™ Easy Match Universal Restorative has statistically significantly better wear resistance than all universal composites tested including Kerr SimpliShade™, Tokuyama OMNICHROMA®, Ivoclar Vivadent Tetric EvoCeram®, Kuraray CLEARFIL MAJESTY™ ES-2 Universal, Dentsply Sirona TPH Spectra® ST HV, FGM Vittra APS Unique, GC G-aenial® A`CHORD, and GC Essentia™.

Strength

Fracture Toughness Test

The values reported for fracture toughness (K_{IC}) are related to the energy required to propagate a crack. In this test, a short bar of material is cured. A notch is cut into it. The bar is placed on a fixture that supports either end, and an anvil is positioned above the notch. The anvil presses down until the bar breaks. This is similar to a 3-point bend test (similar to the fixture that provides flexural strength and modulus data).

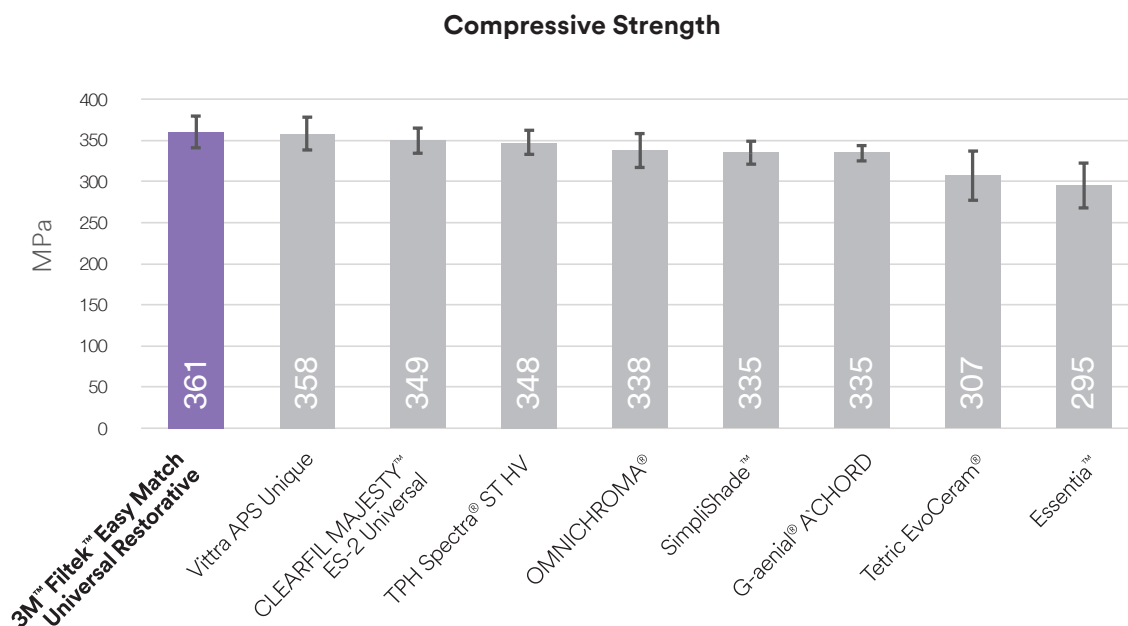
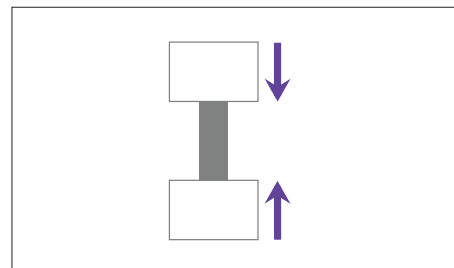


Fracture Toughness. Source: Internal data.* See page 20 for more information.

The fracture toughness test results show that 3M™ Filtek™ Easy Match Universal Restorative is statistically better compared to Dentsply Sirona TPH Spectra® ST HV, Kerr SimpliShade™, Ivoclar Vivadent Tetric EvoCeram®, GC G-aenial® A'CHORD, Tokuyama OMNICHROMA®, GC Essentia™ and Kuraray CLEARFIL MAJESTY™ ES-2 Universal. The fracture toughness of 3M™ Filtek™ Easy Match Universal Restorative is comparable to FGM Vittra APS Unique.

Compressive Strength Test

Compressive strength is particularly important because of chewing forces. Rods are made of the material and simultaneous forces are applied to the opposite ends of the sample length. The sample failure is a result of shear and tensile forces.

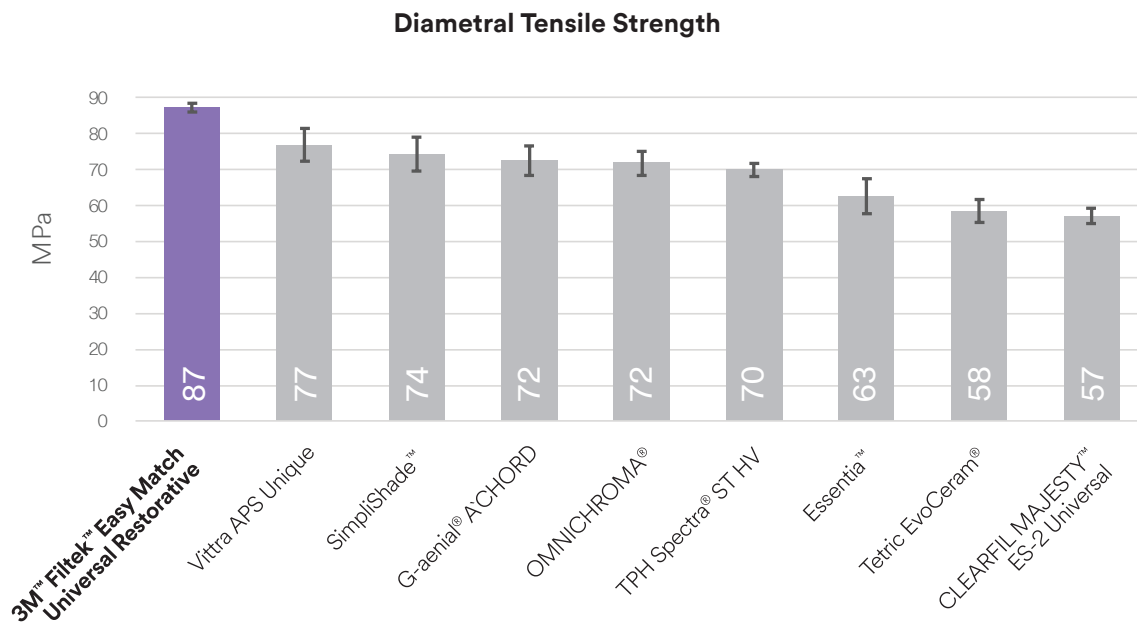
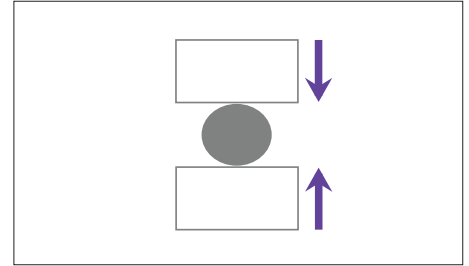


Compressive Strength. Source: Internal data.* See page 20 for more information.

The compressive strength of 3M™ Filtek™ Easy Match Universal Restorative is statistically higher compared to Ivoclar Vivadent Tetric EvoCeram® and GC Essentia™. 3M™ Filtek™ Easy Match Universal Restorative compressive strength is comparable to FGM Vittra APS Unique, Kuraray CLEARFIL MAJESTY™ ES-2 Universal, Dentsply Sirona TPH Spectra® ST HV, Tokuyama OMNICHROMA®, Kerr SimpliShade™ and GC G-aenia® A'CHORD.

Diametral Tensile Strength Test

Diametral tensile strength is measured using a similar apparatus. Compressive forces are applied to the sides of the sample, not the ends, until fracture occurs.

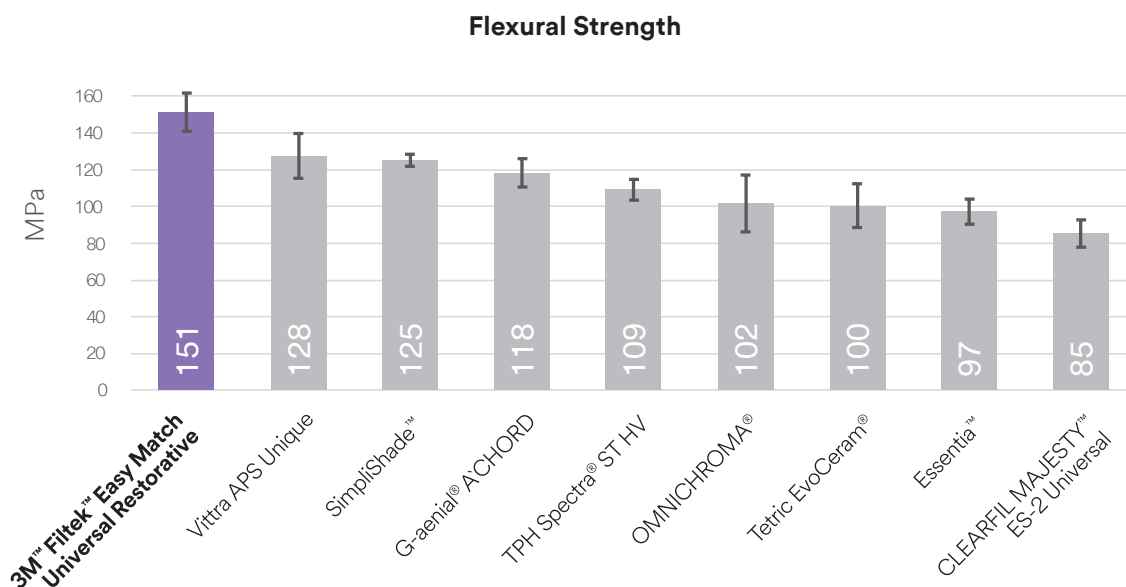
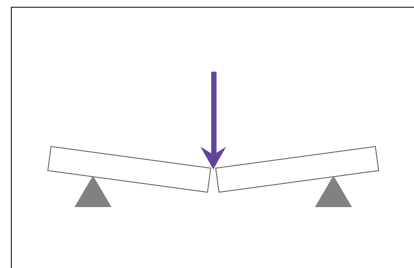


Diametral Tensile Strength. Source: Internal data.* See page 20 for more information.

The diametral tensile strength of 3M™ Filtek™ Easy Match Universal Restorative is statistically higher than all composites tested, including than FGM Vittra APS Unique, Kerr SimpliShade™, GC G-aenial® A`CHORD, Tokuyama OMNICHROMA®, Dentsply Sirona TPH Spectra® ST HV, GC Essentia™, Ivoclar Vivadent Tetric EvoCeram® and Kuraray CLEARFIL MAJESTY™ ES-2 Universal.

Flexural Strength Test

Flexural strength (MPa) is determined by curing a short bar of material. The bar is placed on a 3-point bend fixture that supports either end, and an anvil is positioned above the center. The anvil presses down until the bar breaks. This test combines the forces found in compression and tension.



Flexural Strength. Source: Internal data.* See page 20 for more information.

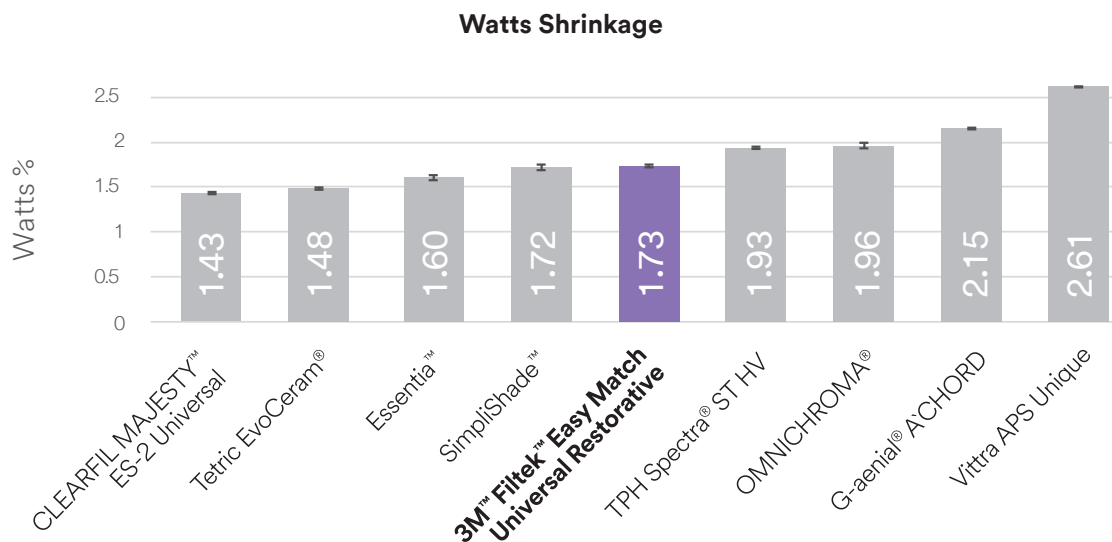
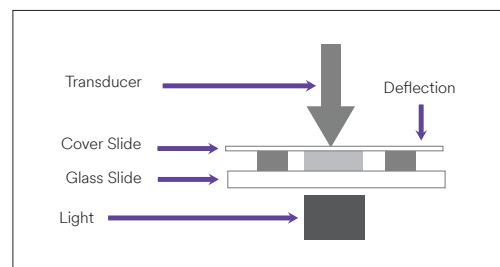
The flexural strength test results show that 3M™ Filtek™ Easy Match Universal Restorative is better compared to FGM Vittra APS Unique, Kerr SimpliShade™, GC G-aenial® A`CHORD, Dentsply Sirona TPH Spectra® ST HV, Tokuyama OMNICHROMA®, Ivoclar Vivadent Tetric EvoCeram®, GC Essentia™ and Kuraray CLEARFIL MAJESTY™ ES-2 Universal.

Shrinkage

Shrinkage can cause stress in the tooth, in the bonding layer and within the composite.

Watts Shrinkage Test

A method for determining polymerization shrinkage was described by Watts and Cash (Meas. Sci. Technol. 2 (1991), 788-794). In this method, a disc-shaped test specimen of uncured paste is sandwiched between two glass plates and light cured through the lower rigid plate. The flexible upper plate is deflected during the polymerization of the test specimen. Less bending of the flexible plate indicates lower shrinkage. Deflection is measured and recorded as a function of time. Although this process measures linear shrinkage, shrinkage was closely approximated because the dimensional changes were limited to the thickness dimension. The lower the value, the less the shrinkage. In this test, samples were exposed for 60 seconds to a 3M™ Elipar™ TriLight Light Curing Unit. The final shrinkage was recorded 4 minutes after the end of light exposure.

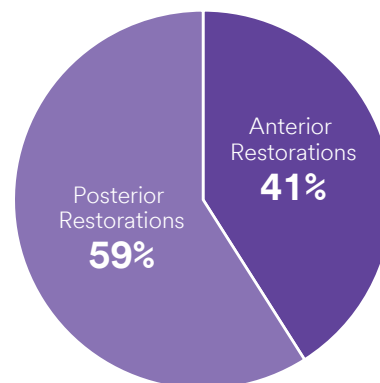


Shrinkage. Source: Internal data.* See page 20 for more information.

The shrinkage test results show that 3M™ Filtek™ Easy Match Universal Restorative is statistically better compared to Dentsply Sirona TPH Spectra® ST HV, Tokuyama OMNICHROMA®, GC G-aenial® A`CHORD and FGM Vittra APS Unique. 3M™ Filtek™ Easy Match Universal Restorative shrinkage is comparable to Kerr SimpliShade™.

Customer Acceptance Test

A customer acceptance test was conducted with 46 general dentists from the United States in 2023 to confirm the in vivo handling and assess the esthetic clinical performance of 3M™ Filtek™ Easy Match Universal Restorative. Recruited dentists were sent packages containing capsules of 3M™ Filtek™ Easy Match Universal Restorative material. They were then asked to evaluate the material for a period of 6 weeks. 2,490 restorations were placed: 1,017 in the anterior and 1,473 in the posterior.

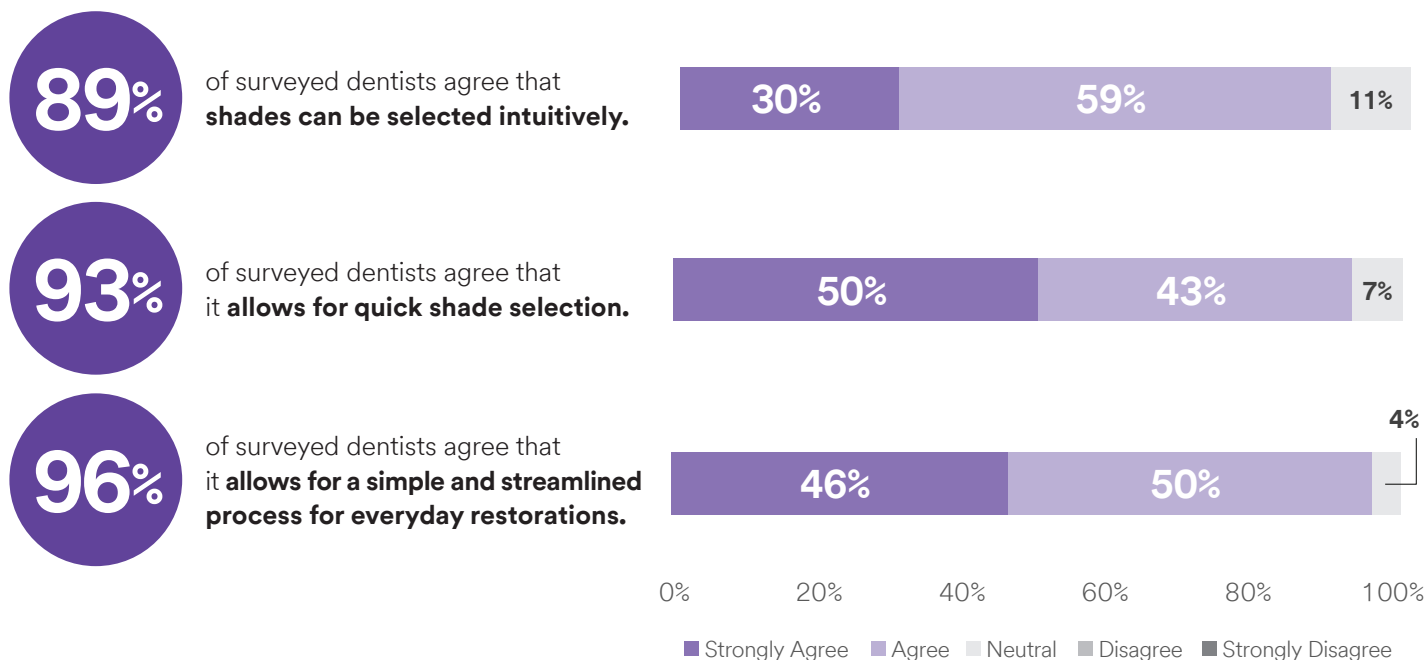


Distribution of Total Restorations Placed

3M™ Filtek™ Easy Match Universal Restorative Shade Match Experience



3M™ Filtek™ Easy Match Universal Restorative Shade Selection Experience (continued)



I really liked the way it blended with the existing tooth structure. I was surprised at how well each shade worked. Very nice.

– Dr. Howard Vincent, USA

This composite has excellent handling capabilities. The 3-shade system will simplify your operatory inventory.

– Dr. Taisa Seneczko, USA

3 shades will cover 99% of all my cases. I can limit my inventory/save money by using this product.

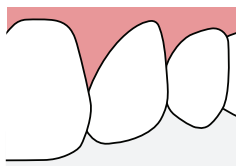
– Dr. Melissa Padgett, USA

I was thrilled with my results. Despite not knowing what each of the three shades initially were like, I quickly learned they blend very well to surrounding tooth structure.

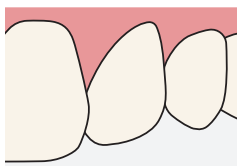
– Dr. Nancy Cozzi, USA

Quick Start Guide

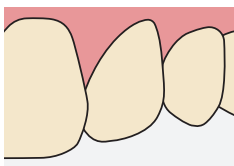
Shade Selection Guide



Bright (B)
Bleach, A1, B1, B2, C1, D2



Natural (N)
A2, A3, C2, D3, D4



Warm (W)
A3.5, A4, B3, B4, C3, C4

- Adhesive**
Follow manufacturer Instructions for Use (IFU)
- Increment Depth**
2.0 mm
- Light Curing**
Halogen Lights: 20 sec. (with output 550-1000 mW/cm²)
LED Lights: 10 sec. (with output 1000-2000 mW/cm²)

Property Comparison Table

| Property | Measurement Unit | 3M™ Filtek™ Easy Match Universal Restorative | Tokuyama OMNICHROMA® | GC G-aenial® A'CHORD | GC Essentia™ | Kerr SimpliShade™ | Ivoclar Vivadent Tetric EvoCeram® | Dentsply Sirona TPH Spectra® ST HV | Kuraray CLEARFIL MAJESTY™ ES-2 Universal | FGM Vittra APS Unique |
|----------------------------|--|--|----------------------|----------------------|--------------|-------------------|-----------------------------------|------------------------------------|--|-----------------------|
| Polish Retention | Gloss % | 75 | 34 | 27 | 13 | 69 | 15 | 12 | 28 | 12 |
| Wear | ACTA 3-body relative to 3M™ Filtek™ Z250 = 1 | 0.47 | 1.35 | 1.79 | 1.99 | 1.09 | 1.52 | 1.73 | 1.62 | 1.77 |
| Fracture Toughness | K _{IC} , MPa m ^{1/2} | 1.89 | 1.29 | 1.33 | 1.26 | 1.52 | 1.47 | 1.67 | 1.23 | 1.98 |
| Compressive Strength | MPa | 361 | 338 | 335 | 295 | 335 | 307 | 348 | 349 | 358 |
| Diametral Tensile Strength | MPa | 87 | 72 | 72 | 63 | 74 | 58 | 70 | 57 | 77 |
| Flexural Strength | MPa | 151 | 102 | 118 | 97 | 125 | 100 | 109 | 85 | 128 |
| Shrinkage | Watts % | 1.73 | 1.96 | 2.15 | 1.60 | 1.72 | 1.48 | 1.93 | 1.43 | 2.61 |

Source: Internal data*

Source: Internal data*
3M™ Filtek™ Easy Match Universal Restorative LOT# 9533695, NC30547, N943580, NC53985, NE57988; Kerr SimpliShade™ LOT# 7677979, 9613025; Tokuyama OMNICHROMA® LOT# 098E53; Kuraray CLEARFIL MAJESTY™ ES-2 Universal LOT# 5D0008, 860011, 850011; GC G-aenial® A'CHORD LOT# 2105101, 2202021, 2202023, 2012181, 2101071; Ivoclar Vivadent Tetric EvoCeram® LOT# Z057TZ, Z045N7, Z04KX4; GC Essentia™ LOT# 2304171, 2305221; FGM Vittra APS Unique LOT# 080222, 300620; Dentsply Sirona TPH Spectra® ST HV LOT# 1802006226, 2303000128

Warranty: 3M warrants this product will be free from defects in material and manufacture at the time of purchase. 3M MAKES NO OTHER WARRANTIES INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. User is responsible for determining the suitability of the product for user's application. If this product is defective within the warranty period, your exclusive remedy and 3M's sole obligation shall be repair or replacement of the 3M product.

Limitation of Liability: Except where prohibited by law, 3M will not be liable for any loss or damage arising from this product, whether direct, indirect, special, incidental or consequential, regardless of the theory asserted, including warranty, contract, negligence or strict liability.