

3M Science.
Applied to Life.™

3M™ Scotchbond™ Universal Adhesive

Why Universal Adhesives Are Here to Stay

[READ MORE](#)



Dentists have more options than ever when it comes to dental adhesives, but choosing the right product doesn't have to be complicated. Universal adhesives are proving to be strong, reliable and versatile, making the choice actually quite simple.

Introduction

Dentists are busy, and so are their patients.

It takes time to stay current with clinical research in order to provide the best care to patients. It takes time to vet new products and meet the day-to-day demands of running a practice. And then there's the time cost when a restoration fails or a patient experiences postoperative sensitivity and must return for a repair — one that the dentist might not be able to bill.

These obligations and time pain points make finding products and systems that maximize efficiency especially important. There isn't one solution to solve every challenge in dentistry, but there is a simpler way to bond: universal adhesives.



Table of Contents

1

Universal Adhesives: Simplicity, Versatility and Choice

2

An Adhesive Class for Every Dentist

3

Strong Bonds Matter

4

Universal Adhesives Pack a Lot Into Each Drop

5

The Science of a Great Bond

6

Key Opinion Leaders Use Universal Adhesives in Their Practices

7

The Time Has Come for Universal Adhesives

Chapter 1:

Universal Adhesives: Simplicity, Versatility and Choice

Universal adhesives streamline the bonding process by reducing the number of products you and your staff have to stock. Using fewer products means fewer steps to memorize. And having fewer steps to memorize means less room for error.

In a word: simplicity.

Patients trust their dentists to stay up to date on the latest innovations. After all, dentists perform life-changing work that makes a positive difference in patients' overall health, comfort and self-esteem.

This is where universal dental adhesives shine. The newest category in a long line of dental bonding adhesives, universal adhesives as a class are designed to:

- Bond to many dental surfaces
- Work in the etch mode of your choice: total-etch, self-etch or selective-etch
- Deliver strong bonds
- Work in both direct and indirect restorations
- Offer all-in-one-bottle convenience, with no need for a separate primer
- Result in virtually no postoperative sensitivity



1

2

3

4

5

6

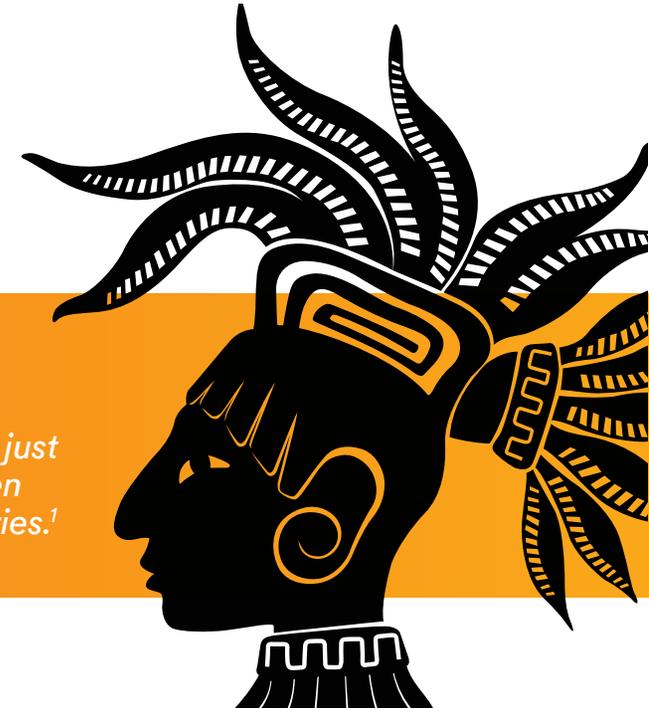
7

Universal Adhesives: Simplicity, Versatility and Choice

Earlier-Generation Adhesives: Multiple Steps and Bottles

Dentists describe the evolution of dental adhesives either as generations or by the number of steps they require. First-generation adhesives produced fairly unimpressive bond strengths and were improved upon through successive generations. Dental adhesives began to achieve much better results by the fourth generation, which, for some, is still considered the gold standard.

Adhesive dentistry has its roots in ancient times. The Maya developed methods to adhere jewels to teeth — just one example of how people have been working on dental bonding for centuries.¹



Universal

- Total-etch, self-etch or selective-etch mode
- One bottle
- One step
- Mainly ethanol solvent

4th Generation

- Total-etch mode
- Multibottle system
- Three steps: etch/ rinse, prime and bond
- Water solvent

5th Generation

- Total-etch mode
- One bottle, combined adhesive and primer
- Two steps
- Mainly acetone or ethanol solvent

6th Generation

- Self-etch mode
- Multibottle system
- Two steps
- Water-based

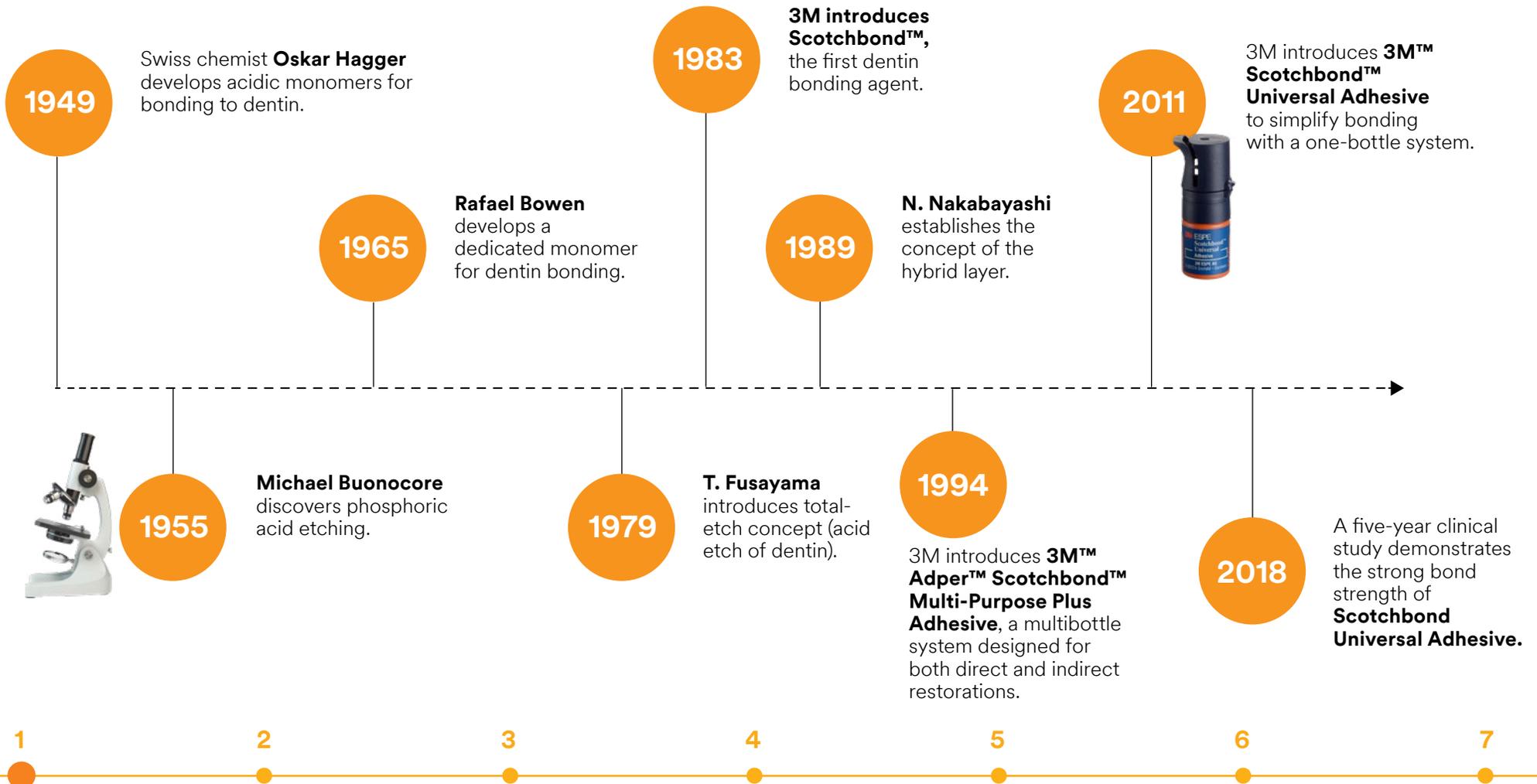
7th Generation

- Self-etch mode
- Single-bottle system
- Single step
- Water and ethanol or acetone solvent



Universal Adhesives: Simplicity, Versatility and Choice

Notable Milestones in Dental Bonding



Chapter 2:

An Adhesive Class for Every Dentist

Adhesive dentistry entered a new era with the arrival of universal adhesives. 3M™ Scotchbond™ Universal Adhesive arrived on the market in 2011 and has been joined in recent years by other universal adhesives.

This new class of adhesives proves that sometimes less really is more. In one bottle, universal adhesives offer dentists freedom to focus on other areas of their practice by giving them:

- The freedom to do their best work no matter the etch technique
- A simple, streamlined system that lets them focus on providing the best patient care
- The opportunity to master and consistently follow manufacturers' instructions for one product instead of having to learn — and remember — instructions for multiproduct adhesive systems
- The benefit of building a reputation for offering patients the latest innovations in dental adhesives

Universal adhesives are built to do more, on more surfaces and in more types of restorations than earlier generations — and in fewer steps. They contain key ingredients that essentially kick into gear when the appropriate conditions arise.

One example of a workhorse ingredient in many universal adhesives is the 10-MDP monomer, which binds the calcium of the tooth to composite resin, improves stability, and bonds to metal and nonglass ceramics. Another feature many universal adhesives contain is an ethanol- and water-based solvent, which helps reduce postoperative sensitivity.



1

2

3

4

5

6

7

An Adhesive Class for Every Dentist



Why the Reluctance to Switch?

Some dentists might be satisfied with the performance of a fourth- or fifth-generation adhesive system, even though its application may require additional steps.

After all, operating a successful dental practice requires delivering consistent, quality results. Keeping up to date on new products and their features while running a business is particularly challenging.

Dentists sometimes default to their familiar standbys rather than try out innovative products. But although earlier-generation adhesives have an undeniably longer clinical study history, the body of research on universal adhesives is growing.

Universal adhesives may be the newest class of dental adhesives, but their relative youth should not diminish the strength of the track record they have established, both in clinical studies and in dental practices around the world.

Dentists can update their adhesives without compromising performance. Research shows that multistep, earlier-generation adhesives do not corner the market when it comes to bond strength and performance.

With 3M™ Scotchbond™ Universal Adhesive, you can expect uncompromised performance backed by 3M's innovative adhesives platform.

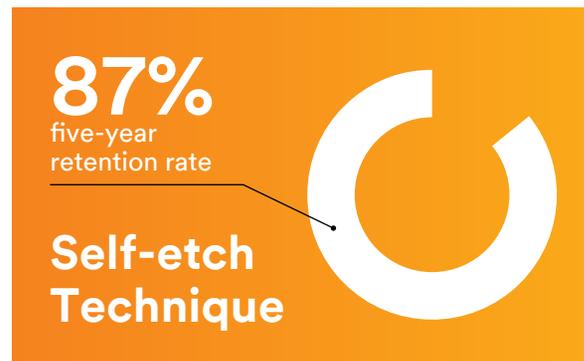
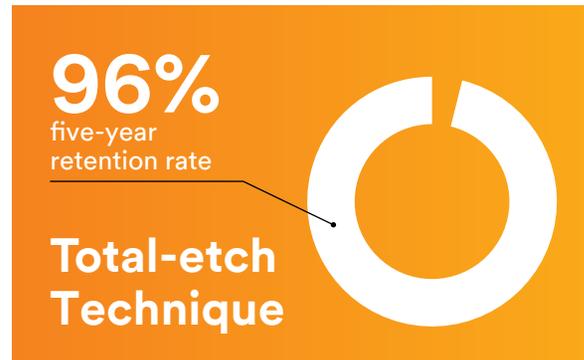
An Adhesive Class for Every Dentist

Clinical Studies Show Universal Adhesives Perform Reliably

Consider the findings of a five-year clinical evaluation of a universal adhesive. Presented in March 2018, the study found that 3M™ Scotchbond™ Universal Adhesive performs as well as or better than an earlier-generation, total-etch, two-step adhesive, 3M™ Adper™ Scotchbond™ Multi-Purpose Plus Adhesive.²

The five-year clinical study was led by principal investigator Nathaniel Lawson, D.M.D., Ph.D., of the University of Alabama at Birmingham. Researchers analyzed 137 dental restorations made to noncarious cervical lesions from 37 adult subjects. The study compared the bond strength of Adper Scotchbond Multi-Purpose Plus Adhesive, a two-bottle etch adhesive, in total-etch mode to Scotchbond Universal Adhesive in both the total-etch and self-etch modes at baseline, six, 12, 24, 36 and 60 months.

The study found that restorations bonded with Scotchbond Universal Adhesive had:



By comparison, restorations bonded with Adper Scotchbond Multi-Purpose Plus Adhesive had a 74 percent retention rate at five years.

The five-year clinical study builds upon the results of an earlier three-year study by Dr. John Burgess, D.D.S., M.S., of the same materials and techniques, which found no clinical differences between Scotchbond Universal Adhesive and Adper™ Scotchbond™ Multi-Purpose Adhesive.

The effectiveness and versatility of Scotchbond Universal Adhesive have been borne out by other studies, as well.

An Adhesive Class for Every Dentist

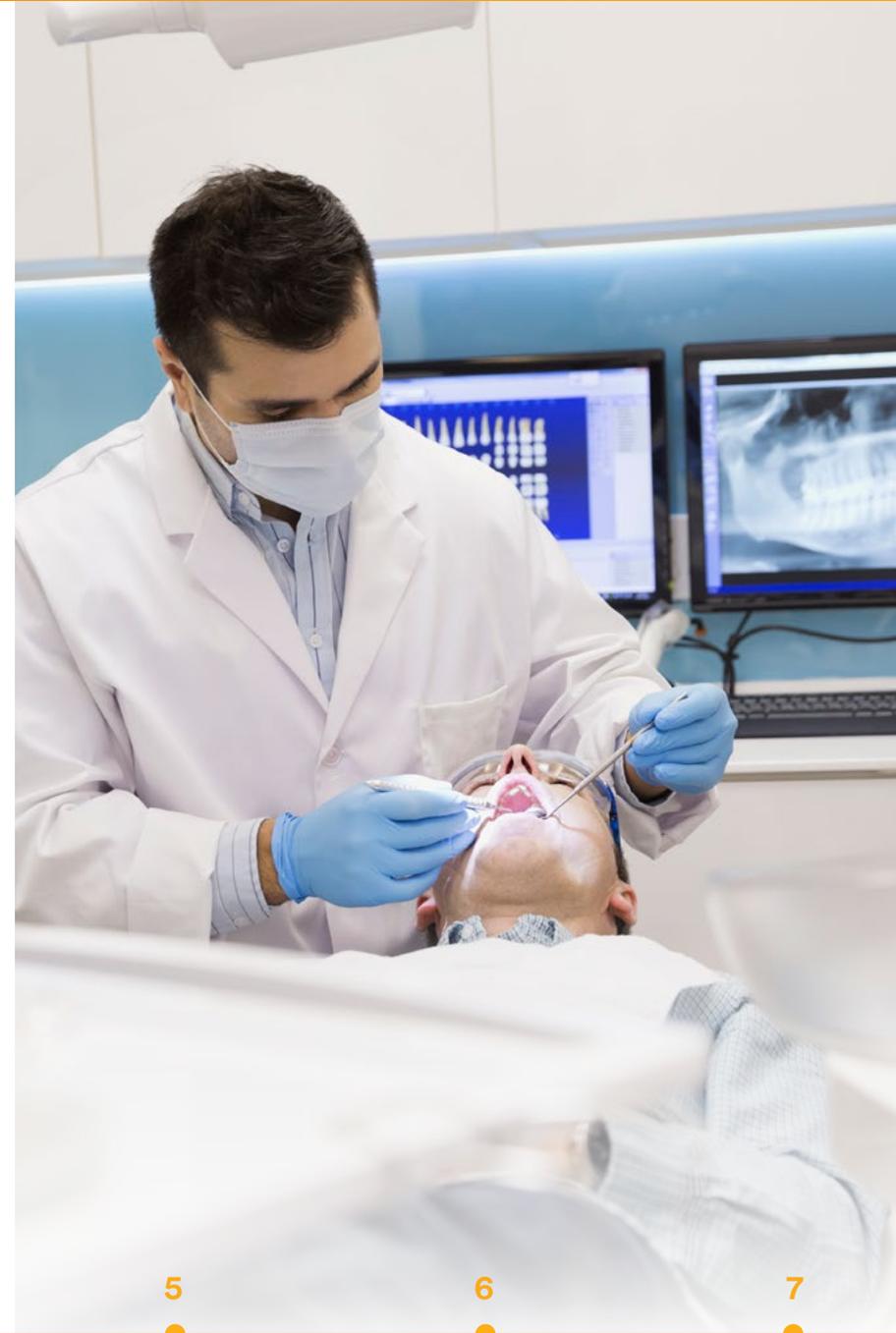
Self-etch and Total-etch, Wet or Dry

A three-year, randomized, double-blind clinical trial conducted by Dr. Jorge Perdigão, D.M.D., M.S., Ph.D., and Dr. Alessandro D. Loguercio, D.D.S., M.S., Ph.D., found that 3M™ Scotchbond™ Universal Adhesive works well in self-etch and total-etch modes.³

In that trial, 200 restorations placed in 39 patients were checked at baseline, six, 18 and 36 months. The results also showed that Scotchbond Universal Adhesive, which was designed to be forgiving of remaining moisture following etch and rinse in total-etch mode, performed similarly in both wet and dry conditions.

Saliva Tolerance

Moisture is a major consideration in adhesive dentistry. Saliva interferes with the bonding process. Scotchbond Universal Adhesive tolerates saliva contamination. While it's best to take steps to avoid saliva contamination, Scotchbond Universal Adhesive has been shown to hold up to modest levels of saliva contamination as well as to high relative humidity. A study of 480 dentin specimens found that on normal dentin, two self-etch adhesives — including Scotchbond Universal Adhesive — produced stable bonds despite high humidity and saliva contamination.⁴



Chapter 3:

Strong Bonds Matter

There is no substitute for proven, effective adhesives designed to provide long-term results.

In the end, it's pretty straightforward: The success of dental restorations depends on the strength of their adhesive bonds. When bonds fail, both dentists and patients suffer the consequences.



For patients, failed restorations can result in:

- Postoperative sensitivity to heat, cold or when biting
- Inconvenient return visits for repair or replacement



Failed restorations can cause dentists to:

- Risk damaging their patients' confidence in their care and treatment
- Possibly lose billable chair time when failed bonds lead to a repair or replacement

Strong Bonds Matter

Strength You Can't See

Dental adhesives play an essential role in the success of dental restorations, but the integrity of their bond strength isn't always easily confirmed by sight or touch. 3M™ Scotchbond™ Universal Adhesive, however, features a yellow tint in the uncured state to facilitate placement. Upon light cure, the yellow photoinitiator is bleached to be nearly colorless.

A single drop of adhesive, with its built-in chemistry, is literally the glue that keeps restorations in place. While dentists know anecdotally what works in their own practices, having data from clinical studies provides added confidence for clinicians who are considering a new product.

Creating restorations with consistent, long-term bond strength and virtually no postoperative sensitivity will give dentists peace of mind, knowing they have selected the right product for their patients and practices.



1

2

3

4

5

6

7

Chapter 4:

Universal Adhesives Pack a Lot Into Each Drop

It's understandable that dentists become comfortable with a particular etch technique for a given restoration. With some dental adhesives, opting for a total etch can entail a three-step process, requiring first the etching and rinsing, then the application of a primer, and finally the adhesive. Each of these steps comes with specific instructions from the manufacturer, and dentists and their assistants must strictly follow these steps to obtain optimal results.

Simplify Your Practice With 3M™ Scotchbond™ Universal Adhesive

Scotchbond Universal Adhesive was specifically designed to pack a powerhouse of chemistry in one bottle. It is tailored to:

- Work in all etching modes: total-etch, self-etch and selective-etch
- Perform in both direct and indirect restorations
- Be self-cure and dual-cure compatible — when used with 3M™ Scotchbond™ Universal DCA Dual Cure Activator, Scotchbond Universal Adhesive is compatible with all resin cements, core build-up materials and self-cure composites
- Work well in the humid oral environment

A multitasker by design, Scotchbond Universal Adhesive doesn't need a separate primer to bond well with all dental surfaces, including:

- Enamel
- Dentin
- Glass ceramic
- Zirconia
- Nonprecious alloys and composites



Universal Adhesives Pack a Lot Into Each Drop

Streamline Your Inventory

Two- and three-step adhesive systems require several products and additional steps. Each step means more information to memorize and more time.

By contrast, a one-bottle adhesive system means less inventory, fewer products to be gathered for different procedures, and fewer instructions to be remembered and followed by dentists and their assistants.

Because 3M™ Scotchbond™ Universal Adhesive is so stable, it doesn't need to be refrigerated. It can be stored at room temperature for two years, and once a bottle is opened, its water- and ethanol-based solvent isn't prone to the thickening that can occur with other types of solvents, especially acetone.

Scotchbond Universal Adhesive can streamline inventory by eliminating the need for dedicated zirconia, alloy and silane primers. Plus, in combination with 3M™ RelyX™ Ultimate Adhesive Resin Cement, Scotchbond Universal Adhesive can deliver ultimate bond strength to glass ceramics with ultimate simplicity.⁵



3M Scotchbond Universal Adhesive is so stable, it doesn't need to be refrigerated.

Universal Adhesives Pack a Lot Into Each Drop

Bottle and Unit Dose Features of 3M™ Scotchbond™ Universal Adhesive

Even the best adhesive needs a well-designed delivery system to make it easy to use. Comfort and efficiency are evident in Scotchbond Universal Adhesive, which has:

- A flip-top vial that can be used with one hand
- A translucent orange bottle that allows you to see the product — unlike some adhesives, which can be hard to see in the bottle — while shielding the photoinitiator from light
- One-step, one-coat adhesive application
- Choice of either single bottle or unit dose delivery
- A bottle that can be stored upside down, reducing waste by enabling practitioners to access its entire contents



Universal Adhesives Pack a Lot Into Each Drop

Reduced Postoperative Sensitivity: Your Patients Will Thank You

There are many reasons to consider switching to a universal adhesive, but patient satisfaction may be the best reason of all. Universal adhesives result in a very low incidence of postoperative sensitivity.

A key benefit, thanks to the chemistry of 3M™ Scotchbond™ Universal Adhesive, is that its water- and ethanol-based solvent dramatically reduces the incidence of postoperative sensitivity to almost zero. The water in the solvent system rehydrates collagen, which can become overly dry when other types of solvents evaporate. Overdrying leads to sensitivity.

A 3M field evaluation in the European Union of 120 clinicians measured the incidence of postoperative sensitivity in more than 8,500 direct applications of Scotchbond Universal Adhesive.⁶ The findings showed virtually no postoperative sensitivity:

- In 3,467 total-etch applications, sensitivity occurred in **0.4 percent** of cases
- In 3,495 self-etch applications, sensitivity occurred in **0.06 percent** of cases
- In 1,544 selective-etch applications, sensitivity occurred in **0 percent** of cases



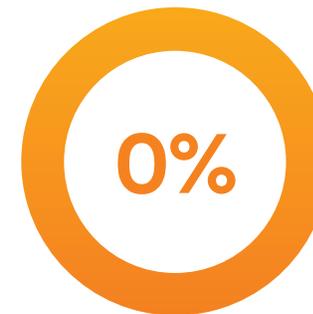
Total-Etch

Sensitivity occurred in 0.4 percent of cases



Self-Etch

Sensitivity occurred in 0.06 percent of cases



Selective-Etch

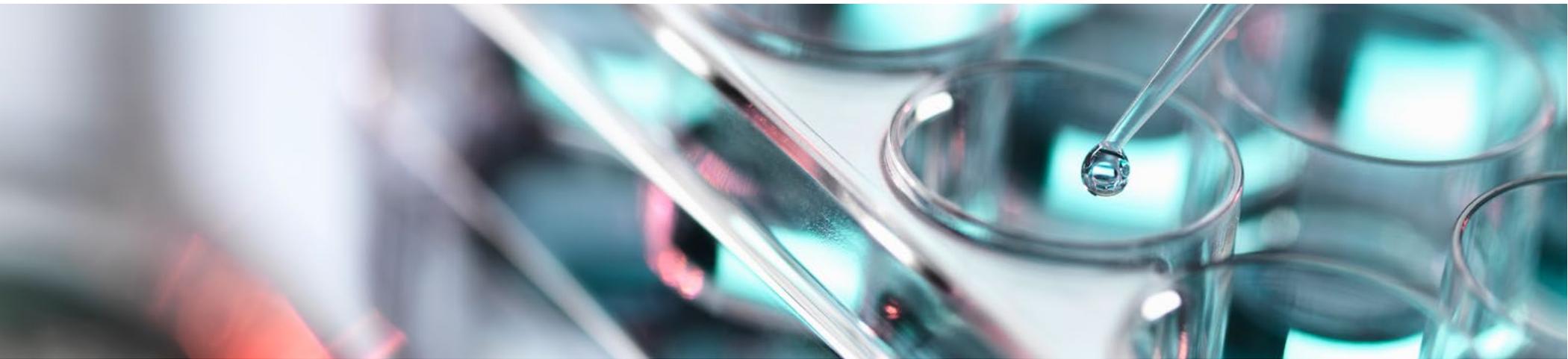
Sensitivity occurred in 0 percent of cases



Chapter 5:

The Science of a Great Bond

There's a science to what makes 3M™ Scotchbond™ Universal Adhesive a versatile, one-bottle solution: VMS.



Vitrebond™ Copolymer lends moisture tolerance, guaranteeing strong bonding with moist or dry dentin in the total-etch technique.

MDP Monomer offers several benefits: It enables self-etch application, the ability to bond with zirconia and alumina, and stability requiring no refrigeration.

Silane in the adhesive formula allows for bonding to glass ceramic without the need for an extra silane primer.

The Science of a Great Bond

Tips for Success With 3M™ Scotchbond™ Universal Adhesive

Don't let uncertainty about how to work with universal adhesives keep you from the simplicity and versatility they offer.

1. Follow the manufacturer's instructions.

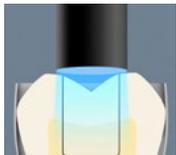
Scotchbond Universal Adhesive's application process takes just 35 seconds. That's it.



Scrub for **20 seconds**. This allows the adhesive to penetrate the tooth and optimizes bond strength.



Evaporate the solvent using a gentle air stream until the adhesive layer doesn't move. This takes about **5 seconds**.



Light cure for **10 seconds**.

2. **Use a rubber dam.** A rubber dam helps protect teeth from humidity. Even when access makes it hard to isolate humidity, Scotchbond Universal Adhesive is designed to work well in both moist and dry conditions, particularly etched dentin.

3. **Etch the enamel.** Scotchbond Universal Adhesive bonds well to dentin in both the total- and self-etch modes, but for enamel, etching will maximize the bond strength.

1

2

3

4

5

6

7

The Science of a Great Bond

An Adhesive Designed to Be Technique-Friendly: To Etch or Not to Etch

With 3M™ Scotchbond™ Universal Adhesive, dentists can use the technique and approach they prefer. Scotchbond Universal Adhesive works seamlessly with their needs and preferences.

Scenario A: A patient needs a Class I or II back-of-mouth restoration that is deep and near the pulp and nerve. Thinking twice about etching in that scenario in case of possible irritation? Then Scotchbond Universal Adhesive could also be used to create a successful restoration using a selective enamel-etch technique. In that case, leave the dentin alone, apply Scotchbond Universal Adhesive, etch the enamel and create a strong bond.

Scenario B: A patient presents with multiple anterior restorations with plenty of enamel and some exposed dentin. Scotchbond Universal Adhesive can be used in total-etch mode, if that's your preferred approach.

Universal adhesives — and Scotchbond Universal Adhesive in particular — provide plenty of options and flexibility.

1

2

3

4

5

6

7



Chapter 6:

Key Opinion Leaders Use Universal Adhesives in Their Practices



Dr. Robert Margeas, D.D.S., has practiced cosmetic and restorative dentistry in Des Moines, Iowa, since 1986. He also serves as adjunct professor at the University of Iowa College of Dentistry and is a key opinion leader in the field of restorative dentistry.

Dr. Margeas understands why colleagues might question the need to switch to universal adhesives if they have achieved consistent, favorable results with earlier-generation products. In fact, Dr. Margeas continues to use fourth-generation etch-and-rinse adhesives for most indirect restorations.

However, Dr. Margeas exclusively uses universal adhesives when performing direct restorations. He shares his reasons why:

“I have been using the universal adhesives ever since they came out. Prior to that I was using etch-and-rinse adhesives, and I still use the universal adhesives even if I have enamel to etch.

“The universal adhesives can be used in self-etch, total-etch or no etch. For me, the universal adhesives in the selective-etch work the best. Why? If I have dentin, I prefer to use the material on the selective-etch where I get the benefit of etching the enamel for great bond strength and getting dentin bond strength by bonding to the smear layer.”

Dr. Margeas found universal adhesives’ very low incidence of sensitivity to be particularly appealing.

“The benefit for me with universal adhesives is you have virtually zero sensitivity. ... That’s why I switched.”

— Dr. Robert Margeas, D.D.S.

Key Opinion Leaders Use Universal Adhesives in Their Practices

“Occasionally I would have sensitivity with an etch-and-rinse prior to the universal adhesives. It all comes down to technique. These are a little bit more forgiving if you are not etching the dentin, and they give you great bond strength.”

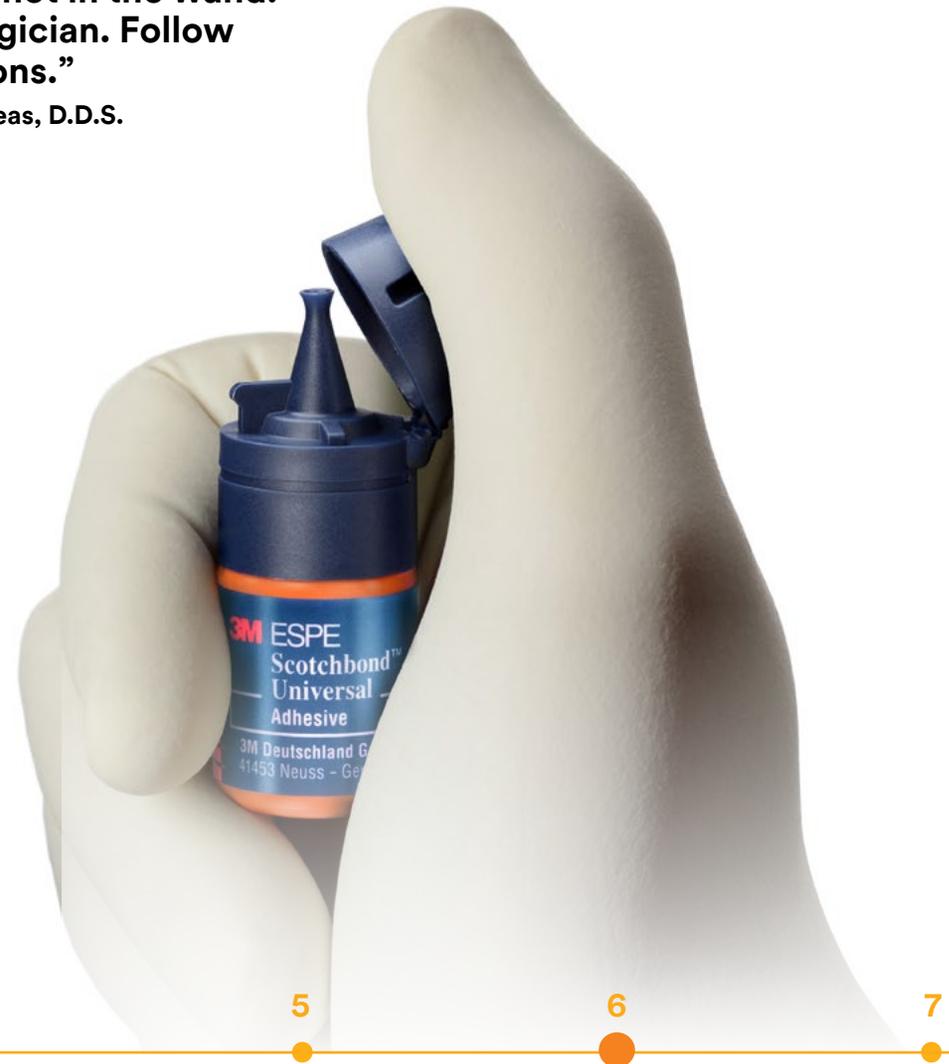
Dr. Margeas decided to try 3M™ Scotchbond™ Universal Adhesive because he trusted 3M’s claims that the adhesive offered unique chemistry.

“If I had patients coming back after using universal adhesives for several months and they were having sensitivity, I wouldn’t care what the manufacturers said. I would go back to my old way. But because I wasn’t having any staining, I wasn’t having any pain on biting, I wasn’t having any sensitivity, then I felt if they were saying it’s a better product, that’s what I’m going to use.”

No matter the adhesive, Dr. Margeas stressed the importance of following manufacturers’ instructions in order to achieve the best results.

**“The magic is not in the wand.
It’s in the magician. Follow
the instructions.”**

— Dr. Robert Margeas, D.D.S.



Key Opinion Leaders Use Universal Adhesives in Their Practices



Dr. Marcos Vargas, D.D.S., has been in dental practice for 32 years and is a professor in the Department of Family Dentistry at the University of Iowa College of Dentistry. He made the switch to universal adhesives several years ago

and uses 3M™ Scotchbond™ Universal Adhesive not only for his direct restorations but also for his indirect restorations.

“I started using them because usually I like to look at the literature, and I like to be evidence-based in my practice, what I do with my patients. And even though the total-etch three-step [adhesives] are still the gold standard, I think there are a lot of benefits to using universal adhesives.”

Universal adhesives offer a big advantage by being compatible with both direct and indirect restorations, Vargas said, and this particular convenience is why he started using them about five years ago.

His preferred technique? Etching enamel in the selective-etch mode, most often with the unit dose delivery.

The practicality of a single adhesive in a single bottle appeals to Vargas, as well.

“I love the unit dose. It’s sealed, so every time you open it, it’s fresh. I like the convenience; there’s no cross-contamination with the bottle. You don’t have to wipe the bottle.”

— Dr. Marcos Vargas, D.D.S.

“I wanted to have one adhesive that works with both [direct and indirect restorations] and with which I was comfortable and used daily. Instead of changing instructions every time, I want to have one set of instructions that I use properly.”

Like Dr. Margeas, Dr. Vargas also emphasizes the importance of technique to a restoration’s success.

“We know the practitioner is more likely to remember what to do when you have a single step instead of multiple steps,” he said, explaining a potential benefit of universal adhesives in enabling clinicians to perfect their use of few steps. “When you look at the literature, we know that the operator is the most influential variable in the longevity and the bond strength that we obtain.”



Chapter 7:

The Time Has Come for Universal Adhesives

Sometimes there isn't one overarching reason to try a new product or innovation, but rather a collection of evidence that makes trying something new worth the effort.

Universal adhesives are worth a try. If data is a major factor in your decision-making, consider the product with more than five years of clinical history.

Consider universal adhesives if ...

- ✓ You want to be efficient.
- ✓ You want to deliver a quality, strong-bonded restoration that will give your patient virtually no chance of postoperative sensitivity.
- ✓ You want to pare down excess inventory.
- ✓ You want to be able to bond to any dental surface, choose your technique and type of etch mode, and work on direct and indirect restorations with the same product in one bottle.

Yes, change can be hard. But it can also bring some pretty impressive benefits.

Learn more about the advantages of universal adhesives by visiting the 3M™ Scotchbond™ Universal Adhesive website.

3M.com/Scotchbond



References

1. Roach, John. [Ancient Gem-Studded Teeth Show Skill of Ancient Dentist](#). National Geographic News. May 2009
 2. A. A. Robles, N. C. Lawson, C. Fu, D. A. Givan, and J. O. Burgess: *Clinical Evaluation of Universal and Two Bottle Total Etch Adhesives at 5 Years*. AADR 2018, Fort Lauderdale, FL, USA. Abstract #1491
 3. A. D. Loguercio, et al.: *A new universal simplified adhesive: 36-Month randomized double-blind clinical trial*. Journal of Dentistry September 2015, 43 (Issue 9), 1083-1092
 4. S. Flury, et al.: *Long-Term Bond Strength of Self-Etch Adhesives to Normal and Artificially Eroded Dentin: Effect of Relative Humidity and Saliva Contamination*. Journal of Adhesive Dentistry 2017, 19, 169-176
 5. 3M: [RelyX™ Ultimate Adhesive Resin Cement: A Collection of Scientific Results](#).
 6. R. Guggenberger, B. Cerny, C. Thalacker, K. Wiggins, and A. B. Soares: *Postoperative Sensitivity with a New Universal Adhesive*. IADR 2012, Iguaçu Falls, Brazil. Abstract #186
-

www.3M.com/Scotchbond



3M Oral Care
2510 Conway Avenue
St. Paul, MN 55144-1000 USA

Phone 1-800-634-2249
Web 3M.com/dental

3M Canada
Post Office Box 5757
London, Ontario N6A 4T1
Canada

Phone 1-888-363-3685

3M, ESPE, Scotchbond, Vitrebond, RelyX and Adper are trademarks of 3M or 3M Deutschland GmbH. Used under license in Canada. Please recycle. Printed in USA. © 3M 2018. All rights reserved. All other trademarks are not trademarks of 3M.