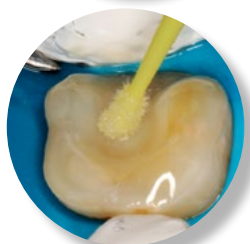


BUILDING THE BETTER BOND

*Adhesive dentistry has advanced dramatically in recent decades,
with BISCO's All-Bond Universal leading the charge.*



How Far We've Come

A once complex, multi-bottle process is now simplified thanks to game-changing products like BISCO's All-Bond Universal.

When bonding agents were first released to the market in the mid-1980s, they looked quite different than they do today. These systems came with multiple bottles, and using them required several steps. But even with those shortcomings, the ability to bond had a significant impact on dentistry, allowing clinicians to do things they couldn't do before.

Over time, manufacturers started to evaluate the limitations of these systems to make necessary improvements. Companies focused on reducing the number of steps involved in the process and creating more user-friendly products. They were successful, which allowed more dentists to incorporate bonding agents into their everyday practice. Of course, there were drawbacks. What these products gained in convenience and ease of use they lost in performance, to the point where bonding agents began to get a bad reputation.

That's all changed in recent years. Companies like BISCO, in partnership with academia and knowledgeable clinicians, have developed formulations that provide the best of both worlds. Today's state-of-the-art bonding agents are easy-to-use single-bottle systems that offer solid clinical performance, with BISCO's All-Bond Universal leading the category.

The Gold Standard in Bonding

All-Bond Universal is a culmination of 30 years of adhesive research. The truly universal adhesive is compatible with dual-cured and self-cured materials, with no separate self-cure activator required. Everything clinicians need for bonding is in one bottle, reducing the number of steps and allowing for a simpler process. The versatile adhesive is indicated for all direct and indirect procedures.

Since its release nearly 10 years ago, All-Bond Universal has become a must-have product for dentists. Not only is it versatile and easy to use, it contains MDP monomers that allow for enhanced durability. Patients



get a strong bond and don't have to worry about post-op sensitivity. And clinicians can choose any etching technique, which means they can bond with or without placing phosphoric acid.

"I like the simplicity and chemistry of universal adhesives such as All-Bond Universal," said Dr. Gary Alex, who has made All-Bond Universal his adhesive system of choice since its introduction. "I use them almost exclusively in a total-etch or selective-etch mode, so for me that means placing phosphoric first, washing it off, and then placing the adhesive."

Through the Generations

Each new generation of adhesives developed before the universal options hit the scene came with their own benefits and challenges. The 4th-generation



Gary Alex,
DMD

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systems offered great clinical performance when used properly, but the problem was they weren't easy to use. These complex systems required multiple bottles, and clinicians had to be aware of the level of moisture they left on the surface they were bonding to, as well as understand how to properly apply the primer.

When the industry moved on from the 4th generation, manufacturers focused on combining primer and adhesive into one bottle, simplifying the process. These 5th-generation adhesives were still categorized as total etch, as were 4th generation adhesives, because clinicians had to use phosphoric acid on the enamel and dentin surface before applying the bonding agent. If this step wasn't completed properly, patients would experience post-op sensitivity.

Manufacturers heeded clinicians' concerns and created adhesives that eliminated the need for this step in the 6th generation. While there were no worries about post-op sensitivity, many of these products lacked the bonding strength necessary for a good clinical outcome. They also required multiple bottles, another issue that needed to be addressed.

By the 7th generation, manufacturers figured out how to combine etching, priming, and bonding into one bottle. While convenient, these adhesives weren't well accepted because they just didn't offer strong clinical performance. Dentists loved the idea of having everything in one bottle, but the products still needed more work—and the research done to

WHAT EXACTLY IS A UNIVERSAL ADHESIVE?

Universal adhesives:

- Are hydrophilic enough to be used as a single-layer adhesive
- Can be used with any etching technique
- Can be used for both direct and indirect clinical procedures using light-cure, self-cure and dual-cure materials without the need for a separate self-cure activator
- Can bond to indirect substrates
- Some, like All-Bond Universal, come in one-bottle systems while others are two-bottle.

make the necessary improvements paved the way for universal adhesives like All-Bond Universal.

The Ideal Solution

This game-changing one-bottle system can be used with any etching technique, simplifying the procedure and giving clinicians the freedom of choice. It also offers versatility, and can be used for both direct and indirect procedures using light-cure, self-cure, and dual-cure materials without the need for a separate self-cure activator.

"We now have products that perform better than previous generations, but that also have the convenience factor embedded into them," said Dr. Rolando Nuñez, BISCO's manager of clinical marketing. "Beyond that, clinicians can use the product with or without phosphoric acid, so it gives them the freedom to choose the bonding technique they prefer. It's a jack-of-all-trades type of product."

THE BENEFITS OF THE MDP MONOMER

MDP is the adhesion promoting monomer that's part of All-Bond Universal's formulation. MDP makes it possible for All-Bond Universal to bond to all composites and resin cements, as well as zirconia and other metal substrates. "

"When it comes to adhesive systems, it's really all about the chemistry. Some chemistries are just more clinically effective than others, especially over time," said Dr. Gary Alex, noting when All-Bond Universal was introduced, it was one of only a handful of adhesives with the 10-MDP monomer. "The 10-MDP monomer has many positive attributes that make it practical for use in a universal adhesive. It is a versatile amphiphilic functional monomer with a hydrophobic methacrylate group on one end (capable of chemical bonding to methacrylate-based restoratives and cements) and a hydrophilic polar phosphate group on the other (capable of chemical bonding to tooth tissues, metals and zirconia)."

Freedom of Technique

With universal adhesives, clinicians can use their preferred technique.

Unlike earlier versions of adhesives, universal options give clinicians the freedom to use any bonding technique they choose—a huge advantage over previous generations. Here's a look at all three of those techniques.

Total-etch. This technique requires the use of phosphoric acid on both the enamel and dentin. Phosphoric acid generates a very retentive surface on enamel, but removes the smear layer on dentin, opening the dental tubules. If the bonding agent can't seal the tubules properly, patients will experience post-op sensitivity.

"They know they're there, but no clinician can see the tubules, even with a clinical microscope that offers 10 or 20 times magnification," Dr. Nuñez said. "You don't know if you're sealing them properly. So, you have great bonding when this technique is done properly, but when not done properly you run into the risk of post-op sensitivity."

Self-etch. Phosphoric acid isn't used to remove the smear layer with this technique. Instead, the adhesive alters the smear layer by making it more permeable, allowing monomers to reach some of the dentin without opening the tubules.

"The self-etch adhesive doesn't have the power or the ability to bond to enamel like phosphoric acid," Nuñez said. "So, the benefit is not removing the smear layer and mitigating post-op sensitivity, but the issue is bonding to the enamel is not optimized."

ALL-BOND UNIVERSAL FEATURES

- Ultra mild acidity (pH > 3) that allows for universal compatibility with dual-cured and self-cured materials
- A hydrophobic, resin-friendly formula for improved bond durability
- A low film thickness that allows the adhesive to easily flow into etched surfaces while also leading to chemical and mechanical sealing
- Fewer bonding steps, with everything included in one bottle
- Easy to use with any etching technique
- Virtually no post-op sensitivity

Selective-etch. Using this technique, clinicians selectively etch enamel, but not dentin, with phosphoric acid to create bond strength and seal, and then use a universal bonding agent.

"You have the best of both worlds with this technique," Dr. Nuñez said. "You've mitigated post-op sensitivity and the bond strength to dentin is optimized because it was etched with phosphoric acid."

No matter what technique clinicians are most comfortable with, they can rely on All-Bond Universal to simplify the process and produce the results they're after.

GET THE MOST OUT OF YOUR UNIVERSAL ADHESIVE

For universal adhesives to be effective, Dr. Gary Alex says dentists must use proper techniques. This includes "meticulous attention to details" such as:

- Control and isolation of the working area
- Proper tooth preparation
- Proper conditioning and priming
- Proper solvent evaporation
- Proper light curing with a quality light-curing unit
- Understanding the materials being used and why, and having some idea of what they are doing

The All-Bond Universal Advantage

Preferred by many of the top clinicians, this leading universal adhesive is state-of-the art.

Today, there are a number of universal adhesives on the market, but it's important to remember they're not all created equal. There are limitations based on the formulations, with some companies adding extras such as silane to bond with a variety of other materials, weakening the bond strength.

How is All-Bond Universal different? The one-bottle solution contains MDP in the formulation to bond to zirconia, metal and tooth structure. These materials offer the most versatility without compromising on bond strength.

Its pH also provides an advantage. Universal adhesives with a low pH aren't compatible with certain materials, such as dual-cure materials like cements and core build ups that are a huge part of everyday practice. Some come with additional activators to make them compatible, but the mixing required defeats the purpose of a one bottle system.

With BISCO's All-Bond Universal, the



Rolando
Nuñez, DDS

"We did all the research and looked at the possibility of incorporating everything into a single bottle that could work in an optimized way and that was 100 percent compatible."



hydrophobic, which serves to improve the durability of the bond.

Based on Research

All-Bond Universal took years to develop and was the first universal adhesive released that didn't require additional activators. And while the team at BISCO continues to look at ways to improve the system, All-Bond Universal is known as the gold standard universal adhesive, serving as a workhorse in practices since it first hit the market in 2012.

balanced pH optimizes bond strength and gives clinicians the ability to bond to any material from any company using any technique they choose, without the need for additional activators. It's truly universal.

"The pH of All-Bond Universal may give it an advantage over other universal systems when placing in-direct restorative materials," Dr. Alex said, "as there is a direct correlation between pH and the compatibility of universal adhesives with self- and dual-cure resin cements and composites."

The All-Bond Universal formula is also

"We did all the research and looked at the possibility of incorporating everything into a single bottle that could work in an optimized way and that was 100 percent compatible. That was very important," Dr. Nuñez said. "There's no adhesive launched by BISCO with compatibility limitations."



Additional Resources

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