**Total versatility Uncompromising performance**

By 3M

Simplifying the bonding step is no easy task. That's why 3M developed 3M™ Single Bond Universal Adhesive. It's a single-bottle solution that offers a simple one-step, one-coat, 35-second application—without compromising strength. Years of clinical evaluations have stacked the evidence. It can be used in all etching techniques, including total-etch, self-etch and selective-etch, in both direct and indirect applications; and on all dental surfaces, without any extra primer—taking versatility to a whole new level.

**Virtually no post-operative sensitivity in total-etch or self-etch applications.**

| Total number of total-etch restorations | 3,467 | 0.4% Percent of total-etch restorations with 3M™ Single Bond Universal Adhesive having post-op sensitivity |
| Total number of self-etch restorations | 3,495 | 0.06% Percent of self-etch restorations with 3M™ Single Bond Universal Adhesive having post-op sensitivity |

To learn more about 3M™ Single Bond Universal Adhesive please visit www.3mgulf.com/dental

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**Total II Amalgam Replacement**

By Dr. Robert Margeas, USA

**About the Case**
The patient presented with recurrent decay under an aging amalgam. Because of the presence of decay as well as the depth of the prep, Vitrebond™ Light Cure Glass Ionomer Liner/Base was chosen and applied to the deepest dentin. After application of the liner, the selective etch approach using Single Bond Universal Adhesive was chosen for its excellent seal on enamel margins while minimizing the chance of post-operative sensitivity. Once the adhesive is cured, Filtek™ Bulk Fill Posterior Restorative was placed in a single increment up to 3mm. Post-operative photos taken two weeks after placement indicate a very pleasing result.

**Challenge**
A deep Class II restoration can be prone to post-operative sensitivity. Use of a liner/base such as Vitrebond™ Liner/Base, as well as a self-etch bonding approach on dentin, combines two techniques for keeping post-operative sensitivity to a minimum. Once the bonding agent is in place, the bulk fill approach allows for a fast, efficient placement technique for posterior restorations.

**The 3M Difference**
3M innovations such as Single Bond Universal Adhesive, Filtek™ Bulk Fill Posterior Restorative and Sof-Lex™ Spiral Finishing and Polishing Wheels provide an efficient and simple procedure while also reducing costly chair time. In cases where deep posterior restorations are presented, Vitrebond™ Light Cure Glass Ionomer Liner/Base can reduce the risk of post-op sensitivity.

**Step by Sep**

1. **Fig. 1:** Pre-operative condition
2. **Fig. 2:** After removal of failing amalgam
3. **Fig. 3:** Use of micro air abrasion to clean the cavity preparation
4. **Fig. 4:** Application of Vitrebond™ Light Cure Glass Ionomer Liner/Base
5. **Fig. 5:** Etchant applied using the selective enamel etch technique
6. **Fig. 6:** Application of Single Bond Universal Adhesive
7. **Fig. 7:** Placement of Filtek™ Bulk Fill Posterior Restorative in a single increment
8. **Fig. 8:** Polishing with Sof-Lex™ Spiral Polishing Wheel (white)*
9. **Fig. 9:** Immediately post-polishing, adjacent enamel is still desiccated
10. **Fig. 10:** Final restoration, two weeks post-op

*Replaced with the new Sof-Lex™ Diamond Polishing system consisting of two new wheels - pre-polishing spiral (beige) and diamond-impregnated polishing spiral (pink).

**Source:** 3M internal data

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Dr. Robert Margeas, DDS

Dr. Robert Margeas currently serves as Adjunct Professor in the Department of Operative Dentistry at the University of Iowa College of Dentistry. He is also the Clinical Director and Instructor at the Center for Esthetic Excellence, Chicago, IL. Dr. Margeas has published numerous articles on aesthetic dentistry and is a highly sought after international lecturer on the subject. His credentials include board certification by the American Board of Operative Dentistry and he is a Fellow of the Academy of General Dentistry (AGD). Dr. Margeas is on the Editorial Board for Contemporary Esthetics and is a consultant in Oral Health matters for the country of Canada. He maintains a very successful private practice, with a focus on comprehensive aesthetic restorative dentistry, in Des Moines, IA.
3M Oral Care

Takes less time, so you have more time.

There are things in life you don’t want to miss. And the more complicated a procedure is, the greater chance there is for something to go wrong and disrupt your day. That’s why 3M Oral Care has simplified posterior restorations... the most frequently performed direct restoration. By using Filtek™ Bulk Fill Posterior Restorative with three other innovative products, you’ll move through posterior restorations with speed and simplicity. See how our Posterior Restorative Procedure can help keep you on schedule... because we know your time outside of work matters.

www.3MGulf.com/espe
Implant maintenance with guided Biofilm Therapy

By E.M.S.

With more and more Implants placed, the challenges of the dental professionals increase to remove calculus and biofilm safely and efficiently. E.M.S., the inventor of PI- EZON® and AIR-FLOW® technologies, offers a peak coated Implant tip which guarantees safe and efficient removal of calculus without leaving scratches on the Implant surface. Furthermore the PLUS powder for all EMS AIR-FLOW devices ensures easy and smooth removal of Biofilm in supra and sub gingival areas around the Implant.

How to best prevent and treat Mucositis and Peri-Implantitis? With PLUS powder and the Perio nozzle for AIR-FLOW it is simple, predictable and ensures superior clinical results. For more information visit the EMS booth at the 9th Dental Facial Cosmetic Conference in Dubai on 03-04 November 2017. You can also look up more details at www.ems-dental.com or contact your regional distributor of EMS products.

Glass ionomer luting cement
• High level of adhesion
• Highly bio compatible, low acidity
• Continuous fluoride release
• Precision due to micro-fine film thickness
• Translucency for an aesthetic result

Glass Ionomer Filling Cement
• For fillings of classe I, III and IV
• Excellent biocompatibility and low acidity
• High compressive strength
• No temperature rise during setting
• Enamel-like translucency
• Excellent radiopacity
• Stable and abrasion resistant

Beautifil II LS

By SHOFU

Beautifil II LS breaks new ground in direct resins technology with its extremely low polymerization shrinkage and related stress while exhibiting superior aesthetics, optimal mechanical properties, ease of handling and polish, lasting natural lustre and remarkable abrasion resistance for universal application. A novel low shrinkage “SRS” monomer formulation and unique filler technology significantly minimizes polymerization shrinkage stress while resulting in a more durable, robust and stable polymer complex that offers greater predictability to your restorations. Tooth-like optical characteristics enable an easy shade match for a wide spectrum of simple to complex, challenging cases. Beautifil II LS exhibits additional anti-plaque benefits and sustained fluoride protection to all your restorations.

Visit us @DFCIC booth no. 29 for a Hands-on trial of Beautifil II LS and the array of benefits that it offers for your practice.

Super-Snap X-Treme Technique Kit

By SHOFU

A comprehensive “new” technique kit from Shofu features the proven Super-Snap (Black-Contouring & Violet- Finishing) and the innovative Super-Snap X-treme (Green-Polishing & Red- Super-polishing) disks in both 12 mm and 8 mm diameter, colour coded for easy identification and sequential use to achieve a natural and lasting lustre on all direct resin composites. Unique 3D structure of the Super-Snap X-Treme Red disks imparts a satiny smooth and flawless surface on the resin restoration. Double sided Polystrips that correspond to the colour codes of the disks, enable easy interproximal finishing and polishing. The kit also contains Dura White stones, Composite and Composite Fine points to complement the disks and easily create detailed surface anatomy in direct aesthetic resin restoration.

Try these X-Treme disks and find how you can achieve the most natural polish on your direct aesthetic resin restorations @DFCIC, Booth no. 29.
MIND BLOWING

MyCrown

- Fully Integrated System
- Fast and Easy to Use
- Grow Your Clinic

Find out more on www.fonadental.com
Case referral to an endodontist for two canals in the mesiobuccal root, and the failure that frequently is associated with endodontic procedures. The ultimate goal of endodontic treatment is to provide adequate access for disinfecting solutions without making major preparations or removing tooth structure. The introduction of nickel-titanium (NiTi) instruments to endodontic practice has been a tremendous boon. Several key factors have added versatility to this technology, for example, the emergence of special designs such as orifice shapers and mechanized glide path files. Another recent development is the application of heat treatment to NiTi alloys, both before and after the file is manufactured.

Basic nickel titanium metallurgy

What makes NiTi so special? It is highly resistant to corrosion and, more importantly, it is highly elastic and fracture resistant. NiTi exists reversibly in two conformational states (austenite vs. martensite) determined in the testing laboratory, with high martensite content typically not having a silver metallic shine but being colored due to the oxide layer, such as gold or blue. It is important to note that NiTi files frequently deform, however, with a delicate touch, cutting is adequate and often even superior to conventional NiTi instruments,6-8 which allows clinicians to retreat cases that previously were considered failures.

Preparation of the endodontic space

The goal of canal preparation is to provide adequate access for disinfecting solutions without making major preparations or removing tooth structure. The introduction of nickel-titanium (NiTi) instruments to endodontic practice has been a tremendous boon. Several key factors have added versatility to this technology, for example, the emergence of special designs such as orifice shapers and mechanized glide path files. Another recent development is the application of heat treatment to NiTi alloys, both before and after the file is manufactured.

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immediately after finalizing the root canal treatment.

Fig. 4: Root canal treatment of tooth #15 with four ca-
Figure 4: Root canal treatment of tooth #15 with four canals.
Primary stability vs. viable constraint: A need to redefine

By Michael R. Norton, UK

Any regular reader of the journal of Oral & Maxillofacial Implants or indeed of any other publication on dental implants could not fail to have noticed how much attention has been focused on Primary Stabilization. The concept of primary stabilisation is not new, indeed as early as the 1970s, there were studies emphasizing the need to establish mechanical stability to ensure an uninterrupted healing of the bone-implant interface was evident in the orthopedic literature as it pertains to hip prostheses.

By the 1990s, numerous reports were being published on immediately loading of dental implants and the ground-breaking work by Branemark in the application of Resonance Frequency Analysis (RFA), which, like a heartbeat, always registers the implant in the bone. An implant that is driven in at a lower insertion torque, would seem to suggest this to be the case. However, it is not the aim to seek comparison to the insertion of a hip stem. Nonetheless, the weight of literature focuses on Primary Stabilization as it pertains to the diameter the resisting torque becomes four times higher. Put another way, if we use the same insertion torque for a 5 mm wide implant and a 6 mm wide implant, then the critical pressure will be five times higher for the larger diameter implant.

For example, an implant of 3 mm diameter inserted into 1 mm thick cortical bone with a torque of 20 Ncm will transmit the same pressure to the bone as an implant of 6 mm diameter inserted into 2 mm thick cortical bone with a torque of 160 Ncm. (This assumes that 100 percent of the torque originates from the pressure on the cortical bone, and the contribution to torque from bone cutting, etc., is neglected.) Yet manufacturers persist in providing a single target value of insertion torque across the range of implant diameters they offer.

It is therefore reasonable to discuss the virtues of insertion torque and ask the pivotal question: Is insertion torque an appropriate measure by which to quantify optimal primary stability? After all, bone is a living tissue, so any measure of primary stability must also reflect the viability of the bone.

It is clear that higher insertion torques fulfill the desire to achieve a high degree of mechanical stability as interpreted through manual per- ception. Indeed, it is usual for manufacturers to provide some guidance on optimal insertion torque with some implant designs being specifically tailored to deliver higher insertion torques, in excess of 75 Ncm. This would be a source of comfort to the clinician that the implant is initially "stable." However, such a high torque has not been shown to be propitious to the interface between bone and implant.

Numerous studies have been published that clearly demonstrate that high insertion pressure these high torques create leads to micro-fracture of the bone; with a net resorption in the cortical zone with a net resorption in the cortical zone 11,12,13 and, indeed, an unfavorable delayed healing process with a reduced bone-to-implant contact. Such a response might well shift the onset for secondary stability and thereby delay or extend the period of potential vulnerability. This is clearly counter to the goal we are trying to achieve with immediate or even early loading protocols, whereby we want to transfer from simple mechanical fixation to full osseointegration in the shortest possible time.

The most fascinating aspect of this debate is the lack of consensus between insertion torque and the Implant Stability Quotient (ISQ) as measured by RFA, which appears to be counterintuitive. How is it possible for an implant that is driven in at 50 Ncm to have the same ISQ as one that required 100 Ncm of torque? Nevertheless, the weight of literature would seem to suggest this to be the case.

Because ISQ is measuring axial stiffness, it must be clear that frictional rotational resistance is a completely different parameter. After all, we don’t doubt we have all experienced the “spinner” (an implant that exhibits little or no rotational stability) that went on to integrate optimally. There are a number of studies published that report high success rates utilizing cortical tissues which were inserted with low insertion torque.

By contrast, implants with an ISQ of less than 50 rarely remain stable or integrate successfully, and ISQ has been described as a good predictor of clinical success. Why is this? Perhaps the clinician has got me thinking and has led me to write this editorial piece. Could it be that the axiologic definition is far more pertinent than rotational friction in ensuring an implant integrates? We already know from the literature that an implant can tolerate a degree of micro-fracture, thought to be around 100-190µm; 14, 15 and this is in essence what ISQ measures.

Studies have also demonstrated that insertion torque correlates closely to the degree of micro-motions that occur during insertion. However, it is not the aim to seek complete elimination of micro-motions. Rather, it is the aim to ensure un-interrupted healing process with a reduced bone-to-implant contact. What reliably ensures the implant can tolerate early or immediate loading. As much was recently proposed by Rarev et al:

I have labeled this objective measure Viable Constraint (VC), whose central purpose is to obtain a concise, rele- vant degree of stability while main- taining a low critical pressure on the bone to ensure an implant integrates through which our implants are inserted.

Bone is not wood. It is not inanimate. It would behoove us all to remember this, and avoid the technician’s approach to implant dentistry. So I would like to offer this suggestion to the reader: How is it possible for an implant that is driven in at 50 Ncm to have the same ISQ as one that required 100 Ncm of torque? More than 20 years, Norton has led the way for implant dentistry in the United Kingdom, becoming one of the world’s most respected and renowned implant surgeons. His considerable portfolio of re- search has been ground-breaking, and he has become one of the most sought after lecturers in his field. Since 1989, Norton has dedicated all his clinical and post- graduate time to the practice and study of implant reconstructive dentistry.

He is secretary, board member and fellow of the Academy of GPRP (Great Britain and Ireland, past president (2019-2021) and is past president of the Association of Dental Implantology (ADI), UK. He is joint editor of the ADI Academy News and is currently associate editor of the International Journal of Oral & Maxillofacial Implants (IJO) and serves as a referee for a number of other peer-review journals.

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Dr. Michael R. Norton, UK
BDS, FDS, RCS(Ed), graduated from the University of Wales, School of Dental Medicine, in 1988. He runs a well-re-nowned practice dedicated to implant dentistry in Harley Street, London. He is a specialist in oral surgery and, in 2007, was awarded a prestigious fellowship of the Royal Col-lege of Surgeons, Edinburgh, without examina- tion. In recognition of his contribution to the field of implant dentistry in 2013, Norton was made adjunct clinical professor to the Department of Periodontology at the Ivy League Dental School at the University of Pennsylvania.

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“It’s a game-changer”: Prime&Bond universal™ with Active-Guard™ Technology

By Dentsply Sirona

Dentsply Sirona has introduced a new universal adhesive designed to ensure complete coverage and penetration for a reliable bond even if the preparation is overly wet or dry.

We spoke with Dentsply Sirona polymer chemist Dr. Christoph P. Fik to learn about the remarkable properties of this revolutionary dental adhesive and how Prime&Bond universal™ with Active-Guard™ Technology was developed.

Dentsply Sirona: Dr. Fik, can you tell us how a new research and development effort gets started? For example, did the marketing team develop a list of requirements that dentists are looking for in a next-generation adhesive like Prime&Bond universal™?

Dr. Christoph P. Fik: The marketing people do conduct market research and develop a set of requirements based on the voice of customers. As chemists, we also have our own insights into the physical and chemical properties that would improve the product and simplify its use for our dental customers.

The clinical team also provides significant input, so it’s a collaboration between all three departments to define the platform requirements for a new product.

We have a series of discussions, document our agreed-upon objectives, and then lock off the actual development effort with a chart set of goals in sight that we believe are both beneficial and achievable.

Talk to us about those goals. What does the ideal dental adhesive need to accomplish?

I see the dentist as a kind of craftsman, and we want to help them achieve a higher level of craftsmanship. Every dentist has preferred techniques to achieve a good restoration for every case, and we’re not necessarily changing that. We want to help enhance craftsmanship with a universal adhesive that dentists can rely on, a product that makes a difference even as technology advances.

Dentists want a universal adhesive that’s more convenient, easier and faster, while ensuring a reliable bond. It needs to provide robust performance across all the different cases a dentist encounters, including direct and indirect restorations. It needs to be simple and predictable to use in every scenario.

What are the limitations of competing adhesives, and how does Prime&Bond universal™ solve those problems?

There are six or seven universal adhesives on the market based on this platform in new in the market for universal adhesives. Active-Guard™ Technology is patented. What is it and how does it work?

Active-Guard™ Technology is a resin component. Other universal adhesive systems are based on two parts; they combine a very hydrophilic, low viscosity compound – a so-called reactive diluent – with a very visous hydrophobic compound, trying to find this balance. With Active-Guard™ Technology, we’ve created a new resin in compound that combines hydrophilic and hydrophobic properties in one monomer. So you don’t have to deal with two parts and reactive diluents – you simply find the balance within a single chemical structure.

Could it be described as “amphiphilic”? Is that what you mean by a balance of hydrophilic and hydrophobic within a single resin molecule?

Yes, but it’s important to distinguish the amphiphilicity of Active-Guard™ Technology from the more familiar use of this term to describe surfactants. With these, you have separate hydrophilic and hydrophobic parts in one molecule, and that’s what allows you to disperse oil in water, for example. But with Prime&Bond universal™, the whole molecule in itself balances hydrophobic and hydrophilic properties without separate hydrophilic and hydrophobic domains of the molecule. That’s unusual in chemistry, and it allows us to balance several benefits. For example, enamel is hard, dry and quite brittle, while dentin is porous, wet and spongy, and the amphiphilicity of Active-Guard™ Technology allows us to achieve exceptional bond strength with both substrates. We’ve also achieved an optimum balance between the properties needed for direct and indirect restorations, between high and low viscosity, and between the requirements for all etching methods.

What are some of the additional benefits of Prime&Bond universal™?

The adhesive layer is extremely thin, compared to other universal adhesives, which can really help avoid fitting problems with indirect restorations. This thinness, combined with a mild pH of about 2.5, also practically eliminates the most common causes of post-operative sensitivity. And it minimizes the risk of pooling, which can otherwise be misinterpreted as a void or decay on a radiograph.

We also thought about simplifying the dentist’s workflow. Prime&Bond universal™ can be stored at room temperature and remains usable for 30 minutes in a closed CliCdish™, so it’s really designed to minimize waste and help streamline procedures, especially when doing multiple restorations in a single visit. And we make sure our products work together, so dentists can have a complete and reliable solution with no risk of product incompatibilities.

We designed Prime&Bond universal™ to work optimally with Calibra® Cement. With this combination, there’s no need to apply a separate activator, and the two products have the right pH values to fuse perfectly, providing much greater shear bond strength compared to other adhesives.

In all you have accomplished to develop Prime&Bond universal™, what gives you the most pride? How will this change the practice of dentistry?

Our patented Active-Guard™ Technology platform is completely new. It introduces a new level of robustness along with much simpler, more reliable handling properties for virtually any case, any substrate and any preparation. It’s a future-oriented technology that I’m convinced will lead to more groundbreaking products based on this platform in the future.

I’m very proud of that. It’s a game-changer.

For more information on Prime&Bond universal™, please contact your local Dentsply Sirona representative.

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We also thought about simplifying the dentist’s workflow. Prime&Bond universal™ can be stored at room temperature and remains usable for 30 minutes in a closed CliCdish™, so it’s really designed to minimize waste and help streamline procedures, especially when doing multiple restorations in a single visit. And we make sure our products work together, so dentists can have a complete and reliable solution with no risk of product incompatibilities.

We designed Prime&Bond universal™ to work optimally with Calibra® Cement. With this combination, there’s no need to apply a separate activator, and the two products have the right pH values to fuse perfectly, providing much greater shear bond strength compared to other adhesives.

In all you have accomplished to develop Prime&Bond universal™, what gives you the most pride? How will this change the practice of dentistry?

Our patented Active-Guard™ Technology platform is completely new. It introduces a new level of robustness along with much simpler, more reliable handling properties for virtually any case, any substrate and any preparation. It’s a future-oriented technology that I’m convinced will lead to more groundbreaking products based on this platform in the future.

I’m very proud of that. It’s a game-changer.

For more information on Prime&Bond universal™, please contact your local Dentsply Sirona representative.