30TH ANNIVERSARY

REALITY NOW

The information source for esthetic dentistry

2017

The Ratings | BONDING AGENTS — UNIVERSAL

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REALITY'S CHOICES

(4.6)

RAVES & RANTS

+ **3-second application time**
+ **Works across-the-board**
- **Need to etch enamel for optimal performance**
- **Cannot use unidose with dual-cured/self-cured materials**

MANUFACTURER

Kuraray
www.kuraraydental.com

PRICES

KITS
Bottle
$160.00/5ml ($32.00/ml)
Unidose (50)
$170.00/5ml ($34.00/ml or $3.40/dose)
REFILLS
Bottle
$135.00/5ml ($27.00/ml)
DC Activator
$86.52/4ml ($21.63/ml)

SHELF LIFE

3.5 years refrigerated

Clearfil Universal Bond Quick

INTRODUCTION/MANUFACTURER'S CLAIMS

Just like its namesake, it is a universal, single-component bonding agent that is stated to work with all direct and indirect procedures as well as with all etching protocols and dentin hydration conditions, i.e., dry, moist or wet. However, to make it universal so it can be used with dual-cured and self-cured composites and cements, you still need to mix it with the a la carte Clearfil DC Activator (unless you are using it with other Kuraray Noritake products such as Panavia SA Cement Plus or Clearfil DC Core Plus).

But the real attraction with this adhesive is its application time. Hint: it is fast! This leads us to several facts of life that occur in many (most?) dental practices when it comes to applying bonding agents. The first fact, which plagues virtually all products, equipment, and materials, is ignoring the DFU/IFU, aka directions/instructions for use. You think you know how to use a product because it seems to be similar to others you have used in the past.

So you may glance at the chairside technique card that comes with many products these days, but these cards are meant to supplement the main directions, not replace them. This is due to the technique cards omitting many of the details from the main instructions that can mean the difference between success and failure.

However, those main directions, which are typically printed on thin, plain paper (they are easily contaminated and virtually impossible to disin-

fect) in a font that requires loupes to read, are many times long-winded, cryptic, and incomplete. So it is no wonder you may ignore them and only follow the aforementioned technique card.

The second fact about applying bonding agents is the tendency to be impatient and not allow them to dwell on the walls of your prep for enough time to perfuse into the tooth structure. This application brevity can result in less than expected performance from the adhesive and can manifest itself in post-op sensitivity, restoration dislodgement, and later down the road, brown lines at the margins that can signify leakage.

The third fact relates to isolation of the operative site. Since dental dams (remember: no rubber anymore) are seemingly only used by a small percentage of clinicians for procedures other than endo, the risk of contamination is always present. So you want to move forthrightly through your procedure before the patient inundates the operative site with saliva.

And finally and certainly no less important, you have office overhead always bearing down on everything you do today in practice, which means you need to be time-efficient to earn enough to pay those bills and maybe even realize a slight profit for fun and entertainment.

With all this in mind, Kuraray Noritake, the manufacturer of the 5 Star, #1 rated, gold standards in self-etch adhesives and resin cements, namely Clearfil SE Bond 2 and Panavia V5 respectively, now brings us still another bonding agent called Clearfil Universal Bond *Quick*. From its name, you can already see that the clever folks at Kuraray Noritake realized that even though they had created some terrific products, these same products still required several steps and more time than many dentists were willing to spend when applying a bonding agent.

So how is *Quick* different than the conventional Clearfil Universal Bond? According to Kuraray Noritake, Quick has a new amide monomer that "rapidly permeates dentin and enamel" and presumably only requires three seconds of application with a rubbing motion. This new monomer combined with tried and true MDP is stated to "provide a very high curing property" resulting in "higher bonding strengths, less fluid absorption, and no waiting time." It also releases fluoride, but we wonder whether its quantity has clinical efficacy.

USES

All types of restorations. Requires mixing with Clearfil DC Activator for dual-cured and self-cured composites and cements.

The evaluators were almost evenly split on how they chose to use it with 31% primarily using it in the etch & rinse mode, another 31% in the selective etch protocol and still another 31% moved between protocols to fit the clinical situation, while the remaining 7% most often used it as a self-etch. One evaluator noted self-etch was used when time was an issue.

COMPOSITION

Adhesive HEMA, bisphenol A diglycidylmethacrylate (BIS-GMA), 10-methacryloyloxydecyl dihydrogen phosphate (MDP), hydrophilic amide monomers, colloidal silica, silane, sodium fluoride, and CQ in ethanol and water. Other Kuraray adhesives are filled 10% by weight, but the manufacturer will not disclose the filler content of this version. Film thickness is stated to be 5-10 microns.
DC Activator Ethanol, initiators, and accelerators.

pH

Adhesive 2.3
Adhesive/DC Activator 3.2

VISCOSITY

Adhesive All evaluators except one thought it was fine, with the lone holdout feeling it was too thick.
Adhesive/DC Activator All evaluators except one thought it was fine, with the lone holdout feeling it was too runny.

ODOR

Adhesive Most evaluators (69%) thought it was similar to other adhesives, while 23% felt it was less offensive and 8% worse than other adhesives.
Adhesive/DC Activator Most evaluators (75%) thought it was similar to other adhesives, while the

other 25% were evenly split between better and worse than other adhesives.

SIMPLIFIED APPLICATION TECHNIQUE

1 Manufacturer states that moisture status of prep doesn't matter. Our tests found in the self-etch mode, 1-2 quick blasts of air should be acceptable, but blotting is still safer in the etch & rinse mode. In the etch & rinse mode, the manufacturer wants you to etch enamel and dentin for 10 seconds, which we found to be effective (one enamel specimen failed within the enamel, not at the adhesive interface). However, it was more effective on enamel when air was used to dry it, while it worked better on dentin with blotting. Therefore, in the etch & rinse mode, etch for 10 seconds, rinse, suction excess water, and blot dentin with gauze, leave it in place, air dry enamel, and then remove the gauze. This should prevent you from over drying the dentin. The prep should still look dry after blotting. Obviously, if the prep is small, you may not be able to use the blotting technique. In this case, use air, but don't overdo it. Blotting the prep is our **MOIST** technique. In the etch & rinse mode, most (64%) evaluators used moist, 27% preferred dry, and 9% went with wet.

As noted above, in the self-etch mode, clean and leave preparation **MOIST** by using 1-2 quick air blasts. In the self-etch mode, most (62%) evaluators used moist, while the other 38% used dry.

2 For **LIGHT-CURED** restorations in the etch & rinse mode, apply the adhesive with **GENTLE AGITATION** for 3s. Do not use the rubbing technique in the etch & rinse mode. For **LIGHT-CURED** restorations in the self-etch mode, apply the adhesive with **RUBBING** for 3s. For **DUAL-CURED/SELF-CURED** restorations, mix equal drops of the adhesive with DC Activator and then apply it as noted above.

The manufacturer's direction of rubbing for both the etch & rinse and self-etch modes can be counter-productive for the former since rubbing previously etched dentin can affect the demineralized collagen matrix and the etched enamel rods.

As far as the 3-second application time, slightly more than half (54%) of the evaluators still chose to apply it 10-20 seconds, while the other 46% stuck with 3 seconds. Several evaluators noted that the recommended 3-second application just made them uncomfortable, so they played it safe by applying it longer. One study shows that 3-second application should be acceptable, but bond strength does increase with longer application times.

On the other hand, our tests using immediate shear bond strength on dentin found no differences among the following groups: one 3-second application, two sequential applications of 3 seconds, one 10-second application, and one 20-second application. Therefore, it appears that the single 3-second application of *Quick* should be clinically acceptable as promoted by the manufacturer.

Most evaluators (77%) used gentle agitation, rubbing/scrubbing was used by 15%, and only 8% used let sit. However, *3 seconds is not a lot of time for any type of manipulation*. In our tests, we applied the adhesive totally covering the bonding site and then we started the timer. Before you can blink, the 3 seconds is over and you are picking up the air syringe to evaporate the solvents.

3 Apply **GENTLE AIR** to evaporate the solvents. Note: *Quick* has the uncanny ability to produce a shiny surface after the solvents are evaporated. In our tests, none of our specimens needed a second coat to produce a shiny surface. This shiny surface is not always achieved with other adhesives after a single application.

4 Light-cure adhesive or the adhesive mixed with the DC Activator for 10s.

*Using this technique, the bond strengths (MPa) with **light-cured** composite were:*

Substrate	Self-Etch	Etch w/PA
Enamel	24.3	29.3
Dentin	24.0	26.7

These results show etching the enamel with PA is very beneficial, while the advantage of etching the dentin is not as significant. These results seem to

support the selective-etch protocol, where enamel is still etched with phosphoric acid, but dentin is not. Note that the enamel tests were done on prepared enamel. Etching unprepared enamel is always a prudent procedure.

No debonds were reported using this adhesive with light-cured materials.

Using this technique, the bond strength (MPa) with self-cured composite using the self-etch protocol on dentin was 22.6.

All evaluators except one who used it with dual-cured or self-cured materials had no bond failures. The lone outlier had one bond failure and that occurred with dual-cured material.

INSIDE SURFACE OF INDIRECT RESTORATION

Composite *Quick*, evaporate the solvent aggressively, and light cure for 10s. If you are using a low viscosity resin cement, applying *Quick* as a wetting agent may not be necessary.
Porcelain/Lithium Disilicate/Zirconia Clearfil Ceramic Primer Plus, which is not included in the kit.
Precious Metal Alloy Primer, which is not included in the kit.

POST-OPERATIVE SENSITIVITY

Direct restorations No evaluators except one reported any postoperative sensitivity, with the lone holdout having only one case after using the etch & rinse protocol. In this case, the application time was longer than 3 seconds.
Indirect restorations No evaluators except one reported any postoperative sensitivity, with the lone holdout having only one case.

PACKAGING

Bottle Kit is in an easy to stack box with product identification on three sides and top. Plastic shrink-wrapped for security. Expiration date is on a label on one side. Most evaluators thought the contents were nicely organized with adequate space for all the components.

The standard squeeze-type bottle has moisture-resistant printing that includes the expiration date, but the light gray printing is difficult to read, although it resists removal during disinfection procedures. One evaluator questioned why the kit did not include DC Activator, which is an a la carte item.

Unidose Kit is in an easy to stack box with product identification on three sides and top. Plastic shrink-wrapped for security. Expiration date is on a label on one side. Unidoses inside are in a Ziploc bag.

The actual unidose has two sections, with the top one being the twist-off cap and the bottom holding the contents. The cap has the product identification and expiration date. The bottom section also has a flat floor so the unidose can stand upright on its own. Most (85%) evaluators liked the unidose but didn't think it was any better than competing products, while the other 15% considered it to be better than other products. One evaluator liked the fact that it stands on its own. On the other hand, you can't use the unidose for dual-cured/self-cured procedures and several evaluators still preferred bottles.

DC Activator Our trial came in a non-resealable plastic pouch. Expiration date is on a label on the front of the pouch. The material is in a conventional, semi-translucent plastic squeeze bottle with the expiration date imprinted in white against the light pink background, which again makes it difficult to read.

DIRECTIONS

Multi-language, plain paper annoying foldout plus in the bottle kit, plastic-laminated treatment room cards with a hole punched in one corner so they can be used in a flip-card style by attaching them with the supplied plastic ring. In the unidose kit, there is a coated paper sheet instead of the cards.

The paper instructions are long and tedious to wade through, but reasonably easy to follow. Beveling porcelain in the marginal area is recommended when performing a repair, but beveling can result in the repair material being overly thin and more likely to flake off or fracture under occlusal load. "Adherend surface" is used, but its meaning can be nebulous.

The laminated, treatment room cards feature color illustrations and easy-to-follow, step-by-step appli-

cation procedures. Overall, the cards are well done, but still omit how to treat the tooth prior to applying the adhesive in the self-etch mode. Most evaluators preferred the cards over the paper version.

The coated paper sheet in the unidose box basically mimics the plastic cards.

REALITY

STRENGTHS Faster than most other adhesives. Clinically acceptable bond strengths even with self-cured composites. Works for all procedures. Nice viscosity. Virtually no sensitivity was reported. Easy to use. Creates shiny prep surface virtually all the time. Available in bottles and unidose. Laminated directions are easy to follow.

WEAKNESSES Still prudent to etch enamel with PA. Need to light cure before seating indirect restorations. Some parts of the conventional directions may need revisions to be clearer. Unidose cannot be used with DC Activator.

BOTTOM LINE

The 3-second application time is a big attraction, especially when time and isolation can be major issues such as in pediatric and geriatric patients, but if adding a few extra application seconds gives you peace of mind, then go for it: your results will still be really good.

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