NOV-DEC, 2020
Vol. 37, No. 07

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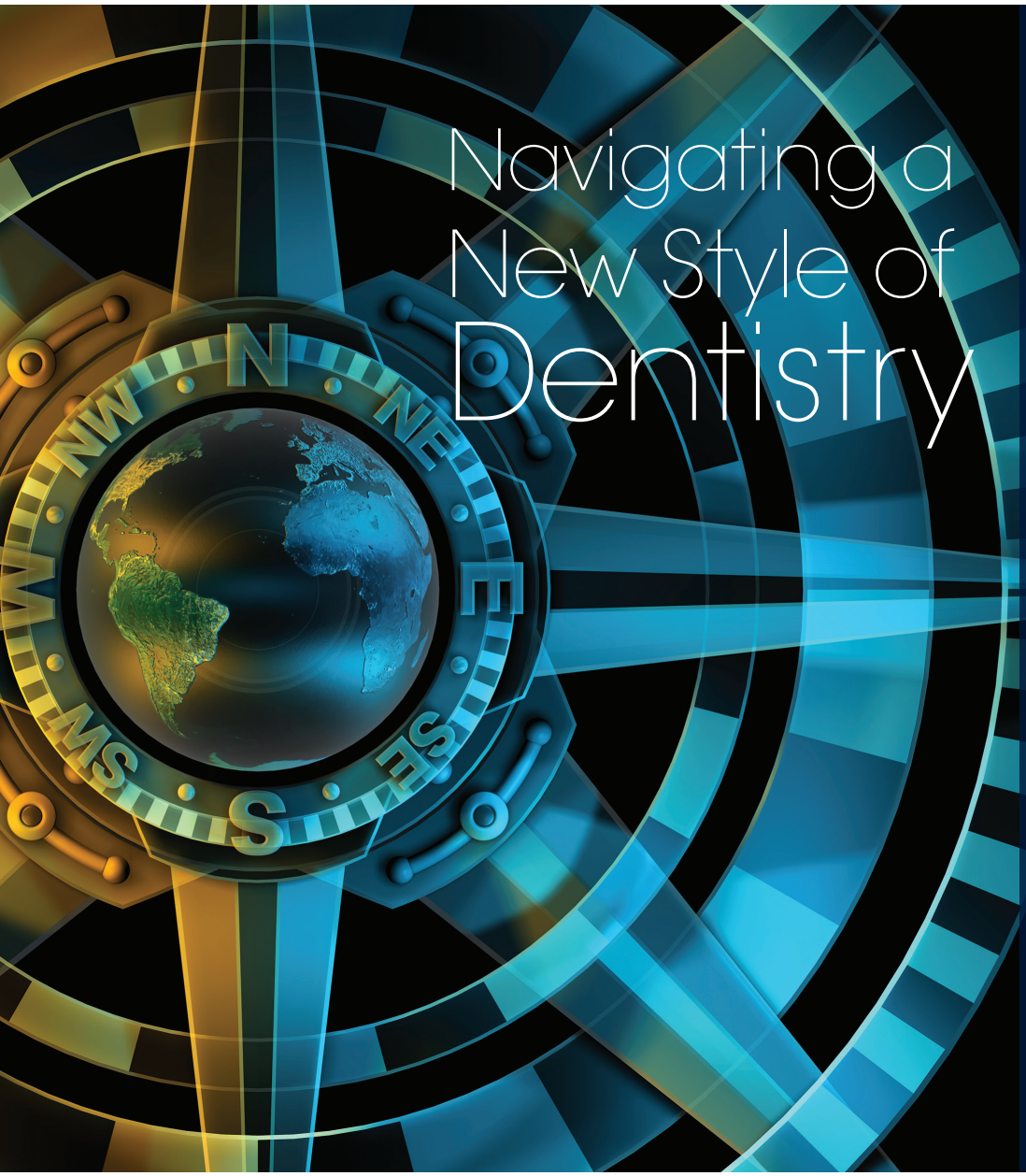


Navigating a New Style of Dentistry

DENTAL ADVISOR
Product insights you can trust.

NOV/DEC 2020
VOL. 37, NO. 7

It would be an understatement to say this year has been interesting and full of change. My dental practice and our team at DENTAL ADVISOR has been outstanding at riding the wave, and it seems the storm still exists. Over the past several months, we have heard from readers from all over the country who are doing their best to do the right things, the safe things for their team and patients, and attempt to navigate a place none of us has been before. Now is a great time to reflect on the year with your team, and look at all of the great things dentistry has survived this year, all the innovation we are seeing, and all of the things we have been doing well. As always, I look forward to your thoughts and comments. You can reach out to me at drbunek@dentaladvisor.com, or to our team at connect@dentaladvisor.com.

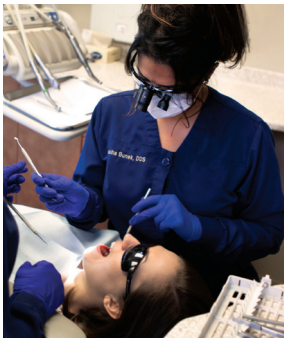
— *Sabiha S. Bunek*

The Year In Review: Where we started, where we are ending

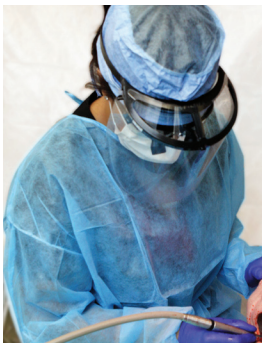
If we take a look back at our typical day in practice prior to COVID, we were already practicing excellent infection control. With the lack of sound scientific data surrounding aerosols, spread of infection, and contradictory guidelines from so many sources, dental professionals are confused to say the least. Our readers and evaluators have shared that they are purchasing without independent research in light of the pandemic.

Adding to the problem is the fact that there have been several Emergency Use Authorizations (EUA) products allowed on the market. These products are cleared for use during the pandemic only, and have not passed all necessary tests for full clearance.

DENTAL ADVISOR remains committed to research that is scientifically relevant and reachable to dental professionals.



Where we started



Where we are now

NOV/DEC 2020
VOL. 37, NO. 7

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Masks and Respirators

***Challenge:** A worldwide shortage of N-95 Respirators and surgical masks continues*

Prior to the pandemic, few if any dental professionals understood the differences between masks and respirators. As of today, many offices are purchasing whatever is available to them for personal protection, often wearing a surgical mask over a respirator to conserve PPE.

***Current recommendations are that any dental professional performing an Aerosol Generating Procedure** (AGP) **should be utilizing a properly fitted respirator** (N95 or equivalent).*

N95 styles

TWO IMPORTANT THINGS TO NOTE ABOUT RESPIRATOR USE:

1. **Every team member in the practice requires medical clearance** from their physician to wear a respirator.
2. **Every team member utilizing a respirator must be initially fit tested to determine efficacy of the respirator.** Once the fit test is successful, the type of respirator, including brand and model, must be documented in the practice's written respiratory protection program specific to that employee.

What if N95's are not available? Alternative methods

Due to shortages on equipment to fit test, lack of knowledge, lack of clarity on state to state recommendations, and inability to procure respirators as a repeat purchase, dental professionals have been left to utilize what is available to them, often adhering to alternative recommendations provided by CDC and OSHA.


KN95

OR

Level 3 Surgical Mask and **Face Shield**

OR


Powered Air Purifying Respirator Device (PAPR)

DENTAL ADVISOR | CLINICAL PROBLEM SOLVER

3M™ Versaflo™ TR-300+ PAPR Systems

Clinician:
Lesley Correll, BS RDH

PROBLEM:

A dental hygienist performing Aerosol Generating Procedures is required to wear an N95 or equivalent for state mandated OSHA guidelines; several attempts were made to find an N95 that achieved both a seal and proper fit. Quantitative fit testing failed due to the shape of her face.

SOLUTION:

3M™ Versaflo™ TR 300+ PAPR Systems provides an alternative to an N95 or KN95 respirator and meets OSHA/NIOSH requirements for personal protective equipment. These systems can eliminate the need for fit testing and provide a constant flow of filtered air when used with an approved head top. The wide field of view allows patients to see your face, improving interpersonal communication. The charged battery will last for up to 10-12 hours.

www.3M.com/Versaflo300

***Challenge:* Initial Fit testing is not being routinely completed by dental practices.**

Access to proper fit testing equipment is problematic due to shortages and dental professionals lack the understanding of the tests necessary prior to use.

Fit Testing

Quantitative Fit-Testing

- Measure aerosol concentrations inside and outside respirator
- Subject is required to don respirator and move in different positions during testing process to replicate daily tasks
- Results are provided as a fit factor (pass or fail) to determine efficacy
- N95 respirator is destroyed during testing

Qualitative Fit-Testing

- Non-numeric pass/fail test
- Subject dons an enclosed hood and a test agent is introduced
- If a smell is detected, it indicates an improperly sealed respirator

Quantitative Testing

Quantitative Fit Tester PortaCount Pro+ (TSI)

Qualitative Fit Testing

Emergency Use Authorizations (EUA): An Important Lesson

Several products have been allowed on the market under emergency use due to shortages and lack of alternatives during the pandemic.

- **Many claims are made that products which have been cleared for EUA have indeed passed all tests normally required for safety and efficacy.** This is simply not true in all cases, and often provides confusing messages to the end user dental professional. We received several inquiries from readers as to the authenticity of products, and have been researching and testing them for months.
- **At the beginning of the pandemic, EUAs were provided for many mask and respirator types, and later revoked by FDA and NIOSH.** The products were deemed ineffective for filtration, the very purpose of a mask or respirator to protect the wearer. Many of these products are still for sale today.
- **The only way to verify efficacy is to look up the company, make and model on the FDA's list of approved products.** Most dental professionals are unaware of this. It is important to know that there is a process involved for submitting products for formal and permanent FDA or NIOSH approval, and investigating each product purchased in your practice is the best way to ensure the products you are using have been deemed effective.

As an example, EUA was provided for several KN-95 respirators. In a time of shortage, several companies began marketing KN-95s as an approved alternative to N95 respirators, having passed necessary tests in other countries for use as a respirator. Months after several models had been sold in bulk to thousands of dental professionals, FDA and NIOSH revoked clearance for several companies, citing improper filtration and performance issues. While some KN-95s are authorized for performance, many are not. FDA recently has said they are not in a position to test and report on counterfeit and/or faulty models and are focusing energy elsewhere.

Signs that a respirator may be counterfeit:

- No markings at all on the filtering facepiece respirator
- No approval (TC) number on filtering facepiece respirator or headband
- No NIOSH markings
- NIOSH spelled incorrectly
- Presence of decorative fabric or other decorative add-ons (e.g., sequins)
- Claims for the of approval for children (NIOSH does not approve any type of respiratory protection for children)
- Filtering facepiece respirator has ear loops instead of headbands

Approved product

Counterfeit product

Source: *https://www.cdc.gov/niosh/npptl/usernotices/counterfeitResp.html*

Face Shields

Due to shortages face shields have popped up on the market from all industries, including dental companies. Even laboratories have been 3D printing parts and assembling shields.

Challenge: *Finding a face shield that fits over loupes*

We have heard from readers that it has been frustrating to find face shields which fit over loupes. **The difficulty is that not all shield manufacturers understand the variations of loupes and lights on the market.** Many claim to fit all sizes and lengths of loupes without interferance.

i-visor Loupes (PacDent)

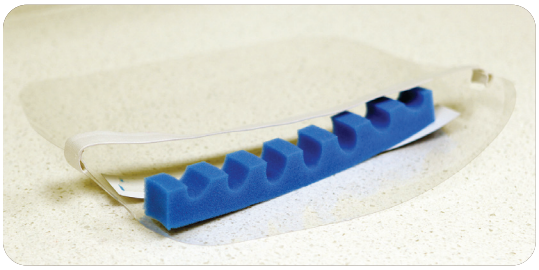
SISU Extend Adjustable Shield (Akervall)

Snapeez Dynamic Disposables Face Shield (Palmero Healthcare)

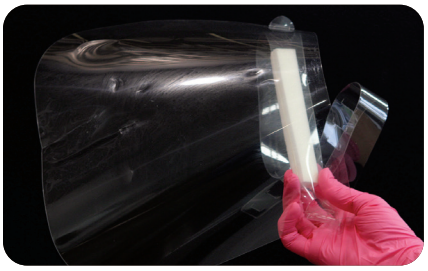
Ultralight Optics Loupes Shield (Ultralight Optics)

Challenge: *Shield durability*

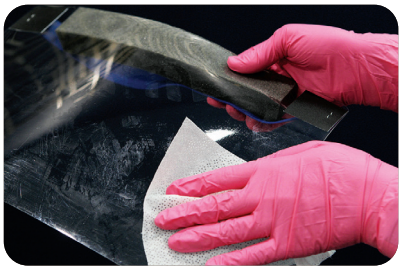
While many shields have been single-use, disposable in the past, durability of the shield for patients, as well as **disinfecting of the shield has become even more important** due to the shortages and rations being placed on orders. Many dental professionals are concerned with the durability of face shields, reporting that disinfectant use on the shield as well as debris are causing pitting and clarity issues after being disinfected. Note that many shields are not meant for repeat use, and one way to determine that is whether disinfection instructions are included. If they are not included in the package, shields should be discarded after a single use.



A foam headband has become detached from the shield.



A shield becomes dented and warped due to overuse.

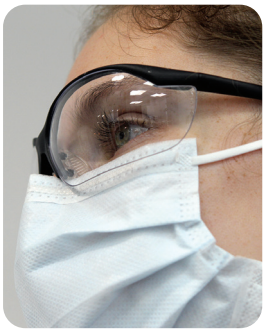


Cleaning a shield with disinfectant can cause it to become cloudy and discolored.

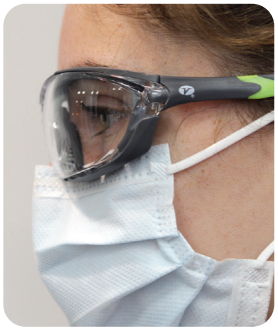
Eye Protection

Challenge: *Eyes are not protected with current eyewear, especially underneath and on the sides*

OSHA's guidelines for eye protection changed recently to state that goggles or face shields were required when eye protection is necessary. For the clinical team, this means using either a face shield which covers the sides of the face or goggles (which seal around the eye) is advised.



Safety glasses showing open gap under eyes

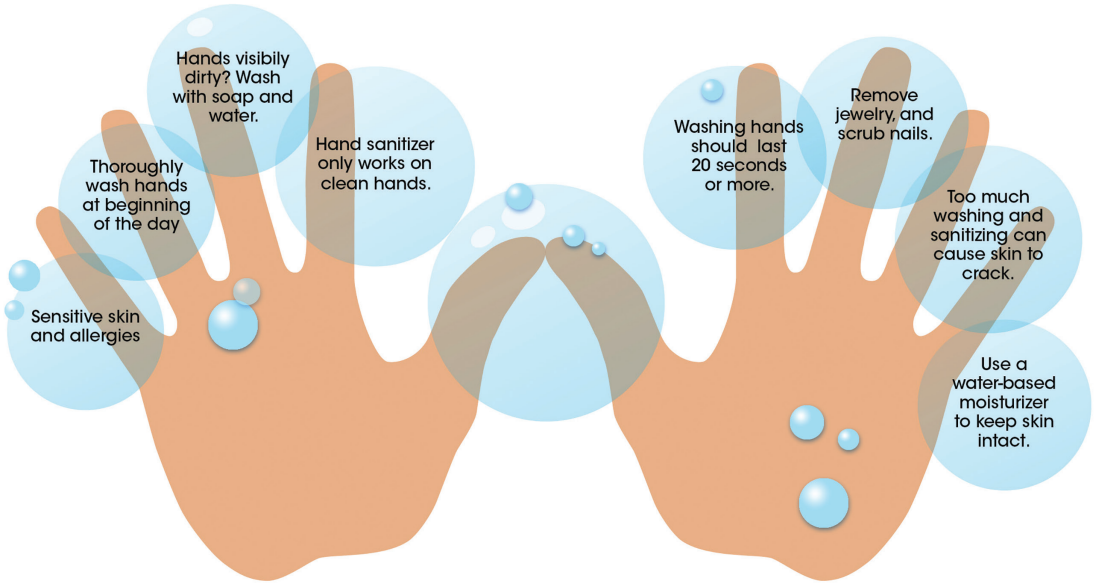


ProVision® Secure™ Safety Eyewear (Palmero)

As we move into the end of the year, we are continuing to see a rise in COVID cases once again. Innovation will continue and DENTAL ADVISOR will be researching and reporting on other topics related to air purification, aerosol management, and innovative PPE.

Surface Disinfection and proper **Hand Hygiene** are the most predictable and measured ways to reduce and eliminate the **chance of cross contamination.**

Hand Hygiene considerations



Surface disinfection: The facts

Do surface disinfectants work?

- *Surface disinfectants are **very effective when used properly.***
- *Instructions for use **must be read and followed for a product to be effective** as claimed.*
- *Note the contact time the surface should remain wet. The **disinfectant has to have time to kill** the virus indicated.*
- *Intermediate-level disinfectants are **strong enough to kill mycobacteria** as well as all of the less resistant microorganisms, including viruses.*

What level of disinfectant is needed?

HIGH RISK ↓ LOW RISK

What it kills:	**Intermediate-level** *(hospital disinfectant with a tuberculocidal claim (TB))*	**Low-level** *(hospital disinfectant)*
MYCOBACTERIA • Mycobacterium tuberculosis	✓	
NONLIPID OR SMALL VIRUSES • Polio virus • Coxsackie virus • Rhinovirus	✓	
FUNGI • Aspergillus • Candida	✓	
VEGETATIVE BACTERIA • Staphylococcus species • Pseudomonas species • Salmonella species	✓	✓
LIPID OR MEDIUM-SIZED VIRUSES • Human immunodeficiency virus • Herpes simplex virus • Hepatitis B and C	✓	✓
CORONAVIRUS *including SARS-CoV-2 (COVID-19)*	✓	✓

Adapted from CDC Guidelines for Infection Control in Dental settings

FIONA M. COLLINS,
BDS, MBA, MA, FPFA

Dr. Collins has presented in North America, Europe, the Pacific Rim and the Middle East. She is a published author and speaker on topics including infection control and OSHA, the prevention and management of oral diseases and conditions, vaping and tobacco, the sugar epidemic and artificial sweeteners, pain management, HPV and dry mouth, and new products, technologies and diagnostics. Fiona is a consultant for the DENTAL ADVISOR, editor for Dental World, a trainer and CE contributor, editor and peer reviewer. She is the ADA representative to the Association for the Advancement of Medical Instrumentation (AAMI), a member of the ADA, Chicago Dental Society, the Organization for Safety, Asepsis and Prevention (OSAP), a participant in Standards working groups and a Fellow of the Pierre Fauchard Academy. During her career, Fiona has lived and worked in five countries, and has held positions in academia, private practice, consulting and industry. Dr. Collins graduated as a general dentist from the University of Glasgow and holds an MBA and an MA from Boston University.

Reminder: 2020 EPA Guidelines

Compliance with the Clean Water Act 2020

Q **Dr. Collins, many offices are concerned with the new EPA guidelines pertaining to the Clean Water Act. What exactly do offices need to do, and how will it be monitored?**

A There are a few key facts that determine what your office needs to do and when that needs to happen. The first question dental professionals ask us is whether the EPA requirements apply to them. In general, if your office discharges wastewater to a public source, and you are not a specialist, you need to comply with the EPA requirements.

Regardless, most offices still need to submit a one-time report that confirms their status but are otherwise exempt from the requirements. They are: Offices where dental amalgam isn't placed, and isn't removed except under unanticipated, unplanned or emergency circumstances; specialist offices that exclusively perform oral pathology, oral and maxillofacial radiology or surgery, orthodontics, periodontics and prosthodontics; and, mobile dental units that are operated at multiple locations.

Check your amalgam separator. If you don't have one, purchase one. Offices need to install and use an ISO 11143-compliant amalgam separator(s) or an equivalent device. That would mean that the separator or equivalent device must be at least 95% effective in removing solids from the wastewater before it leaves the office. Some locations have more stringent requirements than the EPA - for example, 99% efficacy for an amalgam separator. If that's the case where you practice, you must follow these requirements.

Depending on your office, you might choose individual separators or a central system. The separator(s) must be inspected and maintained, and the canister(s) replaced (if applicable) and disposed of in accordance with regulations.

Q **Are there any other components to the requirements?**

A Yes. Amalgam waste not entering the lines (which means that the amalgam separator would not capture it) must be grey-bagged and disposed of in accordance with Federal and local regulations. Secondly, you must not use an evacuation line cleaner that is an oxidizer, with a pH above or below 6 to 8.

Q **What deadlines should I be concerned about?**

A The deadlines depend on when your office first started discharging wastewater to the public supply.

If you do NOT have an amalgam separator, but were discharging wastewater:

PURCHASE

Prior to July 14, 2017:

Deadline to purchase and install an amalgam separator is: July 14, 2020

REPORT

A one-time compliance report must be filed by **October 12, 2020**

PURCHASE

After July 14, 2017:

Deadline to purchase and install an amalgam separator is: Immediately

REPORT

A one-time compliance report must be filed within **90 days of installation**

If you have an amalgam separator:

PURCHASE

Prior to June 14, 2017:

If working properly, you can continue to use until **June 14, 2027.**

REPORT

A one-time compliance report must be filed by **October 12, 2020**

PURCHASE

From an office that was discharging wastewater prior to **June 14, 2017** if you purchased the practice on or before **June 14, 2020**:

REPORT

A one-time compliance report must be filed by **October 12, 2020**

PURCHASE

From an office after **July 15, 2020:**

REPORT

A one-time compliance report must be filed **within 90 days**

The EPA has a website with sample compliance forms and a list of state EPA offices where you can file your report: epa.gov/eg/dental-effluent-guidelines

NOTE: Deadline has passed for compliance. Be sure to check your state guidelines.

DENTAL ADVISOR
Product insights you can trust.

Biomaterials Research Report

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Number 142– October, 2020

Linear Dimensional Change of Impression Materials Before and After Disinfection

M. Cowen, J.M. Powers

Introduction:

An important step of processing dental impressions is the disinfecting and removal of blood, debris, and saliva. The standard method involves thoroughly rinsing the impression under running water to remove as much bioburden as possible and spraying or immersing the impression with a disinfectant with an evidence-based efficacy. The choice of disinfectant used will often depend on the type of impression material as there can be specific incompatibilities depending on the material. A standard disinfectant chosen for fairly broad compatibility and availability is immersion in a 0.5% hypochlorite solution (bleach) for 10 minutes, but this can lead to increased distortion in some impression materials from the extended soaking time required to achieve disinfection. ***Cavex ImpreSafe*** uses a 3% quaternary ammonium compound (benzalkonium chloride) with a short 3-minute immersion time and claims minimal distortion due to the disinfection process compared to other disinfectants. We tested this claim with an alginate and a vinyl polysiloxane (VPS) impression material.

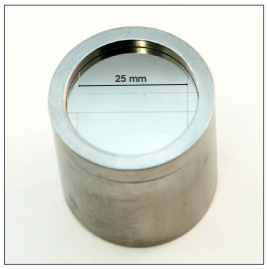
Experimental Design:

Materials: ***Cavex ImpreSafe***, ***Cavex Cream Alginate*** Normal set [lot:191107], ***Flexitime light flow*** (Kulzer) [lot: K010113]

Disinfectants: immersion in ***Cavex ImpreSafe*** [19-16305] for 3 minutes, immersion in 0.5% Sodium Hypochlorite for 10 minutes.

ISO 21563:2013, ISO 4823:2015 Linear Dimensional Change (n=5): This test measures the dimensional stability of impression materials, and how much the material stretches or contracts. An impression is taken against a standard lined test block and the distance between lines 25 mm apart are measured with a traveling microscope to an accuracy of +/- 0.005 mm (0.02% of the full length). The maximum allowed linear dimensional change for ISO 4823 including silicone impression materials is 1.5% and for ISO 21563 including irreversible hydrocolloids (alginates) is 1.0 %.

Measurements were taken before and after disinfection to determine the effect disinfection had on the dimensional change. Results are shown with measurements before and after disinfection compared to the standard lined test block, and the difference of these two measurements is listed as "Due to Disinfection."

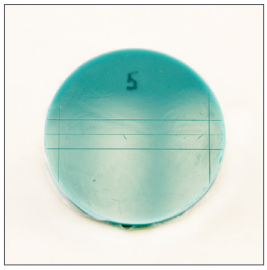


Standard detail reproduction and linear dimensional change die (ADA 18, 19 ISO 4823, ISO 21563). 25 mm distance is used to measure linear dimensional change.

Results:

Disinfectant	Impression Material	Linear Dimensional Change, %		
		Before Disinfection	After Disinfection	Due to Disinfection
ImpreSafe	***Cavex Cream Alginate***	0.12 (0.03)	0.21 (0.02)	0.09 (0.04)
	Flexitime	0.11 (0.03)	0.13 (0.02)	0.02 (0.03)
0.5% Hypochlorite	***Cavex Cream Alginate***	0.11 (0.08)	0.44 (0.07)	0.33 (0.03)
	Flexitime	0.10 (0.06)	0.26 (0.07)	0.16 (0.07)

All specimens passed the ISO requirements for linear dimensional change for alginates (< 1.0%) and VPS materials (<1.5%). Linear dimensional change after disinfection with ***Cavex ImpreSafe*** showed virtually no distortion with Flexitime which was 8X less than hypochlorite (0.02 vs 0.16%), and minor change with ***Cavex Cream Alginate*** that was nearly 4X less than hypochlorite (0.09 vs 0.33%).



Flexitime specimen after disinfection with *Cavex ImpreSafe* showing virtually no distortion.

Conclusion:

Disinfection with ***Cavex ImpreSafe*** provides quick processing of contaminated impressions with minimal distortion, allowing for the maximum possible accuracy in detail reproduction.

DENTAL ADVISOR
Product insights you can trust.

Biomaterials Research Report

Matt Cowen, B.S.
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Number 143 – November, 2020

Non-Latex Dental Dam Tear Testing Comparison

M. Cowen, J.M. Powers

Introduction:

Dental dam isolation of clinical procedures can be a critical step in preventing ingestion/aspiration of instruments and saliva contamination of restorations. One of the common complications with dental dam placement is tearing initiated from the punched hole as the dental dam may need to stretch to over 30 mm in some cases. Previous obsolete tests of dental dams primarily focused on tensile properties with dubious clinical relevance as they were not found to be sensitive to aging, material thickness or tear resistance. As there are no standard clinically relevant tear tests currently in use, DENTAL ADVISOR developed a test to stretch the dental dam material from within a punched hole until failure. In this test, the total elongation of the hole before tearing is the critical factor in determining how far the material can stretch before failure, while the force required to stretch gives an idea of the resistance to stretching or modulus of the material. In this study, we tested the claims of high tear resistance of the cost-effective latex-free polyisoprene ***ISODAM™*** from 4D Rubber compared to competitor materials.

Conclusion:

For clinical procedures where dental dam stretch over 30 mm is required, the 4D Rubber ***ISODAM™*** has best-in-class tear resistance among the non-latex dental dams tested.

Experimental Design:

MATERIALS:

Latex-Free ***ISODAM™***(4D Rubber) medium and heavy gauge, ***Hygenic® Flexi Dam® Non-Latex*** (Coltene) medium gauge, ***Non-Latex Teal Green Dental Dam*** (Coltene) medium gauge, ***Latex-Free Dental Dam*** (Crosstex) medium gauge, ***Polyisoprene Latex-Free Dental Dam*** (Hedy) medium gauge. All products were ordered independently by DENTAL ADVISOR from Benco Dental.

Test Methods: Five units of each of the test products were cut with scissors to produce 25 mm squares from each product. A rubber dam punch was used to make a 2.2 mm diameter hole in the center of the square. A custom test jig composed of two 4.8 mm diameter "L" shaped legs with each leg attached to a universal test machine was used to stretch the material from inside the punched hole until failure. The maximum force and elongation at failure were recorded. The initial 9.6 mm of linear stretch was added to the elongation at failure to give a final elongation value. The load at failure was divided by the thickness of the material to give a normalized load per mm thickness.

Product	Average Thickness, mm	Load at Failure, N	Normalized Load, N/mm
4D ISODAM Heavy	0.25	5.6 (0.4)	22.4 (1.4)
4D ISODAM Medium	0.21	4.6 (0.2)	21.9 (1.1)
Crosstex Dental Dam	0.26	5.5 (0.3)	21.3 (1.2)
Hedy Polyisoprene Dental Dam	0.26	5.1 (0.3)	19.5 (1.2)
Coltene Dental Dam	0.25	4.7 (0.2)	18.9 (0.8)
Coltene Flexi Dam	0.50	4.0 (0.5)	8.0 (1.0)

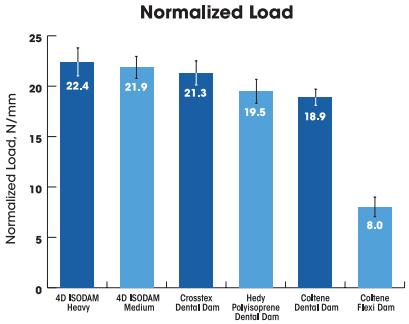

Fig 1. The normalized load which is the load at failure divided by the thickness, shows the amount of load each material could withstand before failure. A lower value can imply either a lower resistance to stretching (pliability) or failure occurs at a lower overall load.

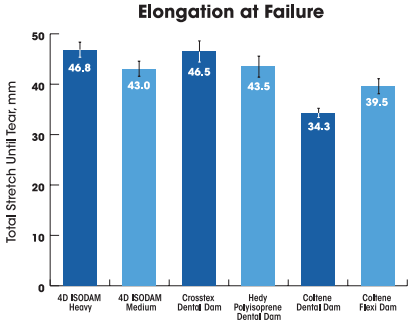

Fig 2. Elongation at Failure shows the total linear stretch the punched hole could withstand before tearing. Higher is better.

ISODAM heavy gauge which has a similar thickness at 0.25 mm as the rest of the materials in the sample, performed slightly better than the next closest dam from Crosstex in both elongation and total load. The normalized load of the same material at different thicknesses is well within the standard deviation of the medium and heavy gauge materials, giving a thickness independent comparison of the flexibility and load bearing capacity of the material while stretching.

ISODAM medium gauge performed within 8% of the next leading medium gauge latex-free dental dam in total elongation before tearing, and within 16% of the maximum load. However, this is primarily due to the medium gauge ***ISODAM*** being the thinnest material tested among medium gauge dental dams for increased ease of access to interproximal spaces and patient comfort. Most dams failed by tearing without significant other deformation with the exception of the green ***Coltene Dental Dam,*** which underwent significant deformation before and after tearing in addition to having the least tear resistance. This could potentially lead to leaking due to the poor elastic recovery and permanent deformation from stretching. ***Flexi Dam*** with around twice the thickness of the other medium gauge dams tested had a low 39.5 mm of

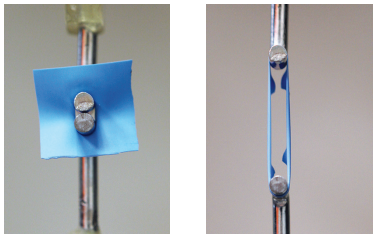

Fig 3. ISODAM heavy initial condition (left) stretched

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Product insights you can trust.

Biomaterials Research Report

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Number 144– August 5, 2020

Bond Strength of 3M Scotchbond™ Universal Plus Adhesive

M. Cowen, J.M. Powers

Purpose:

To test the direct bond strength of ***Scotchbond™ Universal Plus Adhesive*** compared to ***Scotchbond™ Universal Adhesive*** to tooth structure in self-etch and total-etch modes.

Materials: ***Scotchbond™ Universal Plus Adhesive*** (3M), ***Scotchbond™ Universal Adhesive, 3M™ Filtek™Universal, Scotchbond™ Universal Etchant***

Substrates: human superficial dentin, human ground enamel

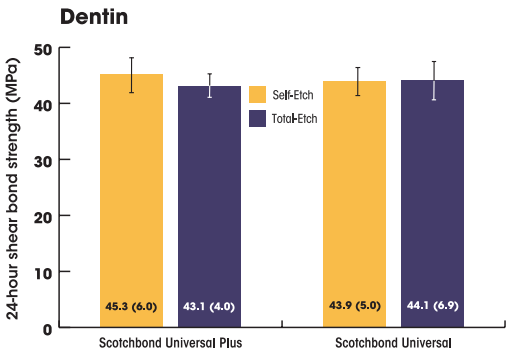
Etching Mode: Self-Etch and Total-Etch

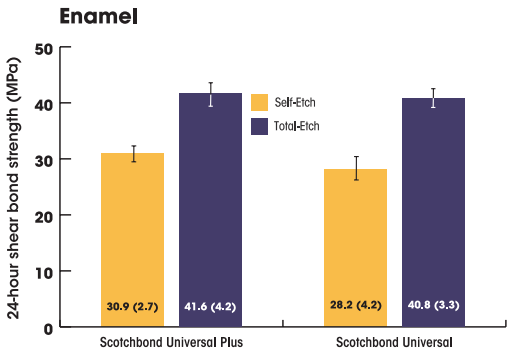
Test Methods:

ISO 29022 Direct Shear Bond Strength, n=8 per substrate:

Human adult molars extracted within the previous 3 months, and sterilized in a 0.5% chloramine T solution, were embedded in acrylic resin discs and ground through 320-grit SiC paper to form bonding substrates of superficial dentin and ground enamel. Specimens were then ultrasonically cleaned in deionized water for 5 minutes to remove grinding debris. Etchant was applied in the total-etch groups with ***Scotchbond Universal Etchant*** (3M) for 15 seconds. Adhesive was scrubbed into the surface for 20 seconds, gently air dried and light cured for 10 seconds with an Elipar Deep Cure-S LED curing light. ***3M Filtek Universal*** was then placed on top of the bonding agent utilizing the Ultradent Shear Test mold and jig to produce a 2.38 mm diameter shear test cylinder according to ISO 29022:2013 and light cured for 20 seconds. The specimens were then transferred to a 37°C deionized water bath until for 24 hours until testing. Testing was performed using an Instron 5866 at a crosshead speed of 1 mm/min according to ISO 29022:2013 and shear bond strength results are given with means and standard deviations.

Results:





Failure modes to dentin predominately involved mixed failures involving tooth structure. Likewise, Total-Etch enamel specimens frequently involved enamel fractures indicating a bond strength close to the maximum shear stress of the tooth structure in these cases. Failure mode to self-etch enamel was adhesive at the adhesive-enamel interface in all cases. There were no visible differences in failure mode between the two adhesives.

Conclusion:

Scotchbond Universal Plus Adhesive has equivalent 24-hour bond strength to tooth structure as ***Scotchbond Universal Adhesive.***

EDITORS' CHOICE

3M™ Scotchbond™ Universal Plus Adhesive +++++

3M 3M.com/ScotchbondUniversalPlus

39 CLINICAL EVALUATORS

1191 TOTAL USES

96% CLINICAL RATING

Key features: Next generation of ***3M™ Scotchbond™ Universal Adhesive***
- Single bottle universal adhesive and primer for all dental materials; covers all direct and indirect bonding indications

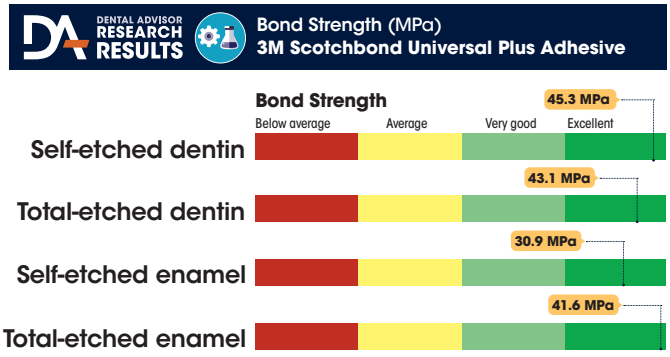
Description

3M™ Scotchbond™ Universal Plus Adhesive is a light-cured, single-component dental adhesive:

- Next generation of ***3M™ Scotchbond™ Universal Adhesive***
- The first radiopaque, universal adhesive available on the market
- Compatible with light-, dual-, and self-cured composite materials, cements, and core-build-up materials
- Can be used with self-etch, selective-etch, and total-etch techniques

Indications

- Bonding of light-, dual-, and self-cured composite or compomer restorations
- Root surface desensitization
- Bonding of pit and fissure sealants
- Protective varnish for glass ionomer restorations
- Repair of composite and compomer restorations
- Sealing of cavity preparations prior to amalgam placement



DENTAL ADVISOR Research Report #144: Bond Strength of 3M Scotchbond Universal Plus Adhesive, August 2020

Unique Attributes

- First radiopaque universal adhesive
- Bonds and seals caries-affected dentin, supporting minimally invasive preparations
- BPA and BisGMA free
- High bond strength to etched glass ceramic; equivalent to silane
- No dual cure activator needed

Clinical Tips

- Gently air dry until adhesive layer appears glossy and uniform
- Treat it similar to ***3M™ Scotchbond™ Universal Adhesive***

"IT HANDLED JUST LIKE SCOTCHBOND UNIVERSAL AND I LOVE THE RADIOPAQUE FEATURE."

Evaluators' Comments

"It did not run all over the tooth when being air dried - it stayed where I put it."

"After drying, it was easy to tell if you have a nice layer of material over the entire surface to be bonded."

"The re-designed bottle delivers a very small amount at a time."

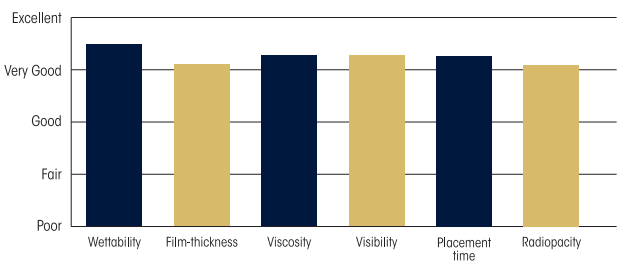
"I did not experience any post-op sensitivity."

"You can use it with many more bonding procedures without the need for a separate activator."

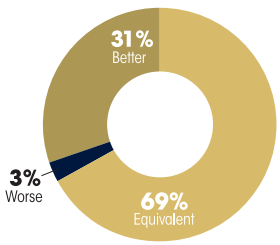
"I like its slightly thicker consistency. This gives me the feeling that I am properly coating the cavity preparation."

"Can pool at line angles if you don't thoroughly air dry."

Evaluation Summary:



Compared to Competitive Products:



Consultants who would:

100% Recommend to a colleague

Consultants who would want to stock in office:

41% Yes, instead of current product

43% Yes, in addition to current product

14% No, however I might want to order it for certain cases

EDITORS' CHOICE

3M™ RelyX™ Universal Resin Cement

+++++

3M 3M.com/RelyXUniversal

12 CLINICAL EVALUATORS

425 TOTAL USES

99% CLINICAL RATING

Key features: Dual-cure cement ● Both adhesive and self-adhesive modes ● Four shades ● Innovative, waste reducing syringe design

Description

3M™ RelyX™ Universal Resin Cement is a dual-cure universal cement with an innovative syringe design.

- It can be used in either the adhesive or self-adhesive mode for cementation
- Kit contains ***3M™ Scotchbond™ Universal Plus Adhesive*** for adhesive cementation
- Available in shades A1, WO, A3O, and TR, which coordinate with the ***3M™ RelyX™ Try-In Pastes***
- Adhesive strength can be enhanced further with the use of 35% phosphoric acid

Indications

Use of ***3M™ RelyX™ Universal Resin Cement*** in Self-Adhesive Mode or Adhesive Mode with ***3M™ Scotchbond™ Universal Plus Adhesive*** for final cementation of:

- All-ceramic, composite, or metal inlays, onlays, crowns, and bridges
- Ceramic, glass fiber-reinforced composite or metal posts, as well as screws
- All-ceramic, composite, or metal restorations on implant abutments

Use of ***3M™ RelyX™ Universal Resin Cement*** in Adhesive Mode with ***3M™ Scotchbond™ Universal Plus Adhesive*** for final cementation of:

- All-ceramic or metal Maryland bridges and 3-unit inlay/onlay bridges
- All-ceramic or composite veneers and occlusal veneers

Evaluators' Comments

"The syringe is super comfortable to hold and has an indicator on the plunger to show when it is empty."

"It's great to have one cement with options for for self-adhesive and adhesive bonding."

"The unique mixing tip allows for minimal waste."

"Having one material to use for all cases is great."

"The 6-minute wait for self-cure was my only complaint."

"The choice of shades was helpful."

"The new syringe and tip are a wonderful combination! Excellent enginerring."

Unique Attributes

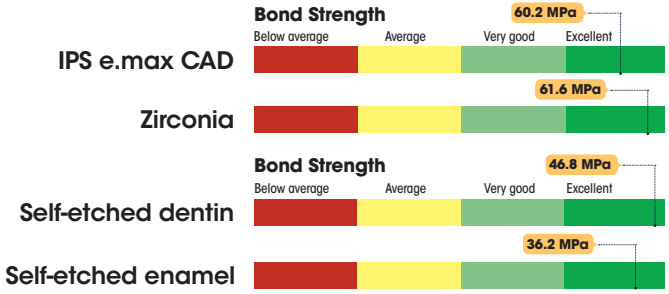
- Redesigned tip significantly reduces wasted material in the mixing tip
- Truly a universal cement as it can be used in either Adhesive or Self-Adhesive mode and used for any substrate

Clinical Tips

- Do not allow cement to cure too much when tack curing or it will be very difficult to remove excess
- Extrude from tip slowly with light pressure
- The most difficult thing about resin cements is cleaning up interproximally. Clean interproximal areas first, whenever possible

DENTAL ADVISOR RESEARCH RESULTS — Bond Strength (MPa)

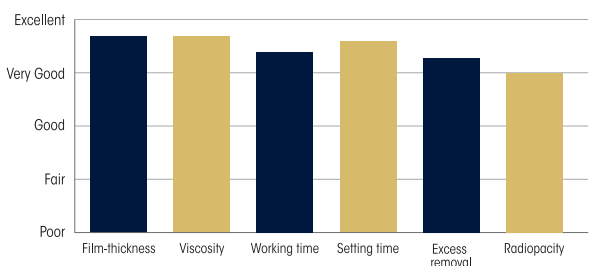
3M™ Scotchbond™ Universal Plus Adhesive combined with 3M™ RelyX™ Universal Resin Cement



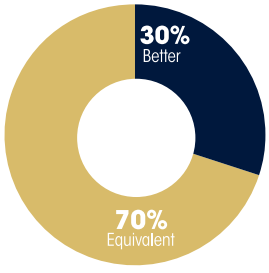
DENTAL ADVISOR Research Report #133: Resin Cement Bond Strength to Multiple Substrates, July 2020

- Self-adhesive bond strengths of the 3M cement to dentin, enamel and zirconia substrates are the highest of any self-adhesive cements tested with this method by DENTAL ADVISOR.
- Adhesive bond strength to dentin and enamel was excellent, and in particular, the zirconia bond strengths are the highest among the universal adhesives tested.

Evaluation Summary:



Compared to Competitive Products:



Consultants who would:

100% Recommend to a colleague

Consultants who would want to stock in office:

44% Yes, instead of current product

56% Yes, in addition to current product

EDITORS' CHOICE

ZirClean®

Bisco www.bisco.com

+++++

dentaladvisor.com RATING SYSTEM: Excellent + + + + + Very Good + + + + Good + + +

35 CLINICAL EVALUATORS

896 TOTAL USES

98% CLINICAL RATING

Key features: ● Indirect restoration cleaning agent ● For use after try-in ● Syringe dispenser

Description

ZirClean® is an indirect restoration cleaning agent:

- Non-abrasive cleaning of the intaglio surface of zirconia, ceramic, and metal restorations
- Removes phosphate contamination from saliva after intraoral try-in
- Gel formulation

Indications

- Cleaning of zirconia restorations after try-in
- Cleaning of ceramic restorations after try-in
- Cleaning of metal restorations after try-in

Unique Attributes

- Syringe delivery system
- Easy placement and clean up
- Removes contaminants after try-in to improve bond strengths

Clinical Tips

- Using a wet Q-tip to clean out the bulk of the ***ZirClean®*** makes it less messy.
- Rinse it out in the operatory sink. With the air-water syringe, it tended to splatter out.

"GREAT PRODUCT WITH A SIMPLE DELIVERY."

Evaluators' Comments

"I like that I didn't have to scrub the surface."

"It is quick since it only takes 20 seconds."

"It is nice not having to leave the operatory to clean the crown with air abrasion."

"It stays where you put it and the color contrasts well against zirconia."

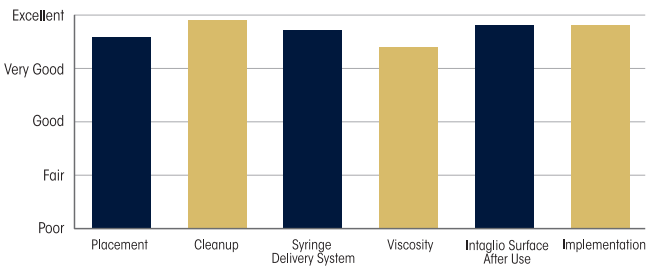
"Simple, effective, and good for zirconia inlays/onlays and veneers too."

"There appears to be a very clean bonding surface after its use."

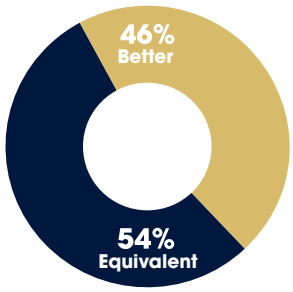
"I felt like I had to use a lot of material to ensure I covered the entire intaglio surface."

"The color looks too similar to my phosphoric acid."

Evaluation Summary:



Compared to Competitive Products:



Consultants who would:

100% Recommend to a colleague

Consultants who would want to stock in office:

54% Yes, instead of current product

43% Yes, in addition to current product

0% No, however I might want to order it for certain cases

3% No

CLINICAL EVALUATION

FIT SA™

Shofu Dental www.Shofu.com

++++½

dentaladvisor.com RATING SYSTEM: Excellent + + + + + Very Good + + + + Good + + +

DENTAL ADVISOR ++++½

30 CLINICAL EVALUATORS

787 TOTAL USES

92% CLINICAL RATING

Key features: Self-adhesive flowable composite ● Bioactive ● Two viscosities

Description

FIT SA flowable restorative material:

- Self-adhesive - no separate bonding agent needed
- Releases and recharges 6 ions, including fluoride, for the life of the restoration via Shofu's Giomer Technology
- Available in two viscosities: (F03) low flow and (F10) high flow

Indications

- Liner
- Class III restorations
- Class V restorations
- Small class I restorations such as a preventive resin restoration (PRR)
- Other non-load-bearing restorations

Unique Attributes

- Easy and fast technique with no separate etchant or adhesive needed.
- The two viscosities make it more versatile with uses as a liner or for select restorations.
- This product's bioactive properties have an anti-bacterial, acid neutralization, and tooth strengthening effect.

From the DA Lab *(Research Report #129 Lab Evaluation of FIT SA)*

Shofu FIT SA Viscosity	Substrate	Shear Bond Strength, MPa
F03	Dentin	10.9 (1.6)
	Enamel	25.0 (3.7)
F10	Dentin	10.5 (2.7)

This excellent self-etched enamel bond strength is similar to that achieved by most self-etching universal adhesives, while the dentin bond strength is above average compared to self-etching self-adhesive cements. This should provide adequate initial adhesion for most indications.

Clinical Tips

- Be careful when placing layers not to make them too thick, especially the first 0.5 mm layer.
- Use the low flow for Class V restorations.
- Express prior to use and keep pressure on the handle to prevent bubbles. Do this yourself instead of the assistant handing it to you, as the release of pressure from the handle during the exchange can cause bubbles.
- Great for the initial fill in Class II box preparations. You get a great seal against the matrix band and the floor of the preparation.

"EXCELLENT FLOWABILITY WITH BOTH THE LOW AND HIGH VISCOSITIES."

Evaluators' Comments

"I had less sensitivity issues with this material."

"It has a smooth workability."

"It is just a more efficient system."

"Great product, especially when working fast because isolation is a challenge."

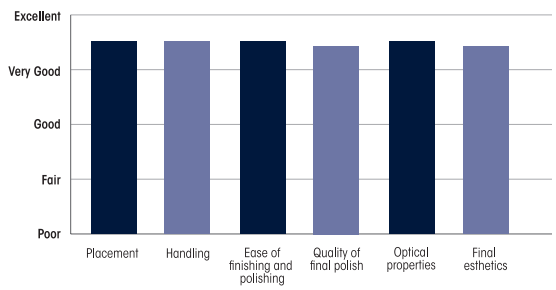
"I liked the optical properties and luster of the final polish."

"I'm assuming this is the first of many products like this and it's exciting. As someone who has practiced a long time, I can see that this is the start of another great advancement."

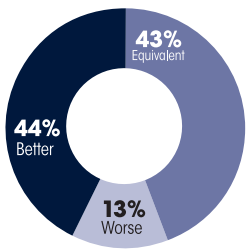
"The technique requires an initial 0.5 mm layer that is difficult to not make too thick."

"I felt the material was too translucent in some applications."

Evaluation Summary:



Compared to Competitive Products:



Consultants who would:

97% Recommend to a colleague

3% Not recommend to a colleague

Consultants who would want to stock in office:

31% Yes, instead of current product

53% Yes, in addition to current product

13% I might want to order it for selective cases

DiaFil™

DiaDent www.diadent.com

++++

DENTAL ADVISOR ++++

36 CLINICAL EVALUATORS

814 TOTAL USES

87% CLINICAL RATING

Key features: Nano-hybrid composite resin ● Anterior and posterior use

Description

DiaFil is a nano-hybrid composite resin with:

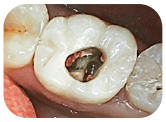
- Reported minimal shrinkage, to reduce stress and post-op sensitivity
- Reported high fracture toughness, high tensile and compressive strengths
- Reported low solubility in the presence of oral fluids

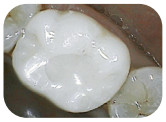
Indications

- Anterior and posterior restorations
- Core buildups
- Splinting

Unique Attributes

- Designed to be highly esthetic: optimal translucency, opalescence, and fluorescence with remarkable color stability
- Viscosity: low viscosity makes for easier handling
- Marginal adaptation: adapts well to margins with different designs





Clinical photos courtesy of Dr. Frank Berman

Clinical Tips

- Roll it into small balls and place it using a non-serrated amalgam plugger
- Ambient light sets it up very quickly. Use orange filters and minimize background light
- Easier to sculpt when placing rather than cutting back upon finishing
- Loved using it where contours didn't have to be achieved with a band or strip
- Use wetting resin

"FANTASTIC ESTHETICS!"

Evaluators' Comments

"Polishability is superior to any other composite I have ever used."

"Color of the composite blends in well with tooth structure."

"Esthetics are great, and it is easier to place and handle than most composites."

"Opaque enough to cover a lot of dark areas."

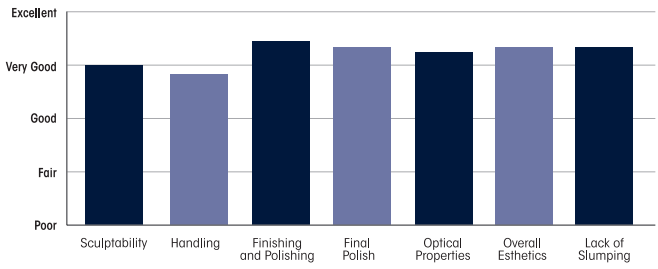
"Nice consistency."

"Handling was nice, it was not sticky, and it holds the contours it is sculpted into."

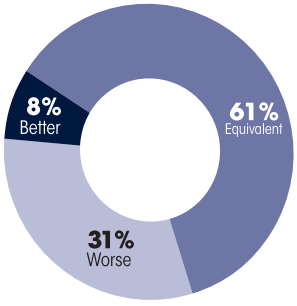
"So firm that sculpting was not easy sometimes."

"A little too opaque for some anterior cases."

Evaluation Summary:



Compared to Competitive Products:



Consultants who would:

83% Recommend to a colleague

17% Not recommend to a colleague

Consultants who would want to stock in office:

6% Yes, instead of current product

58% Yes, in addition to current product

19% No, however I might want to order it for certain cases