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ADMINISTRATION

60-01 Mercury Hygiene Web Briefing

(Project 99-40)

DIS currently has several Powerpoint briefings on the DIS web site that have been produced to provide teaching resources to federal dental clinics in meeting yearly mandatory training requirements. A Mercury Hygiene briefing has recently been prepared to assist local facilities in training dental personnel about the potential hazards and the safe handling of mercury. The 30-slide presentation can be downloaded from the Download page of this web site.

(Lt Col Roberts)

QUESTIONS & ANSWERS

"Questions & Answers" is a feature in which we present and answer the questions we most frequently receive from the field. This month we feature questions about expiration dates, gloves for clinical use, and approved products for treating A-dec dental unit waterlines. Should you want more information about a particular topic, please contact the individual whose name follows the specific answer in which you are interested. If you have a question about a topic not discussed in this issue, feel free to call DIS at DSN 240-3502.

60-02 Confusion about Expiration Date Format

Question: I know that it is important to pay attention to the expiration date on dental products. Recently, though, I ran into a confusing date on a product. The date I saw on it was 01-02. I don't know if that means the product expires in January 2002 or February 2001. Is there a standard format used when dating products?

Answer: Actually, there is a standard format that has been proposed by the International Organization for Standardization (ISO). The ISO develops and adopts standards for use around the world in an attempt to prevent confusion when different standards are used by different countries or by different groups within a country. Your situation is exactly what the ISO is trying to prevent. In 1988, the ISO developed a draft standard for dates and times that dealt with this issue (ISO Standard 8601). A recent revision appeared in 1997 and it clearly describes the recommended format. In a nutshell, the international standard date notation is YYYY-MM-DD. Therefore a date such as April 23, 2001 should be written as "2001-04-23". If just a month and year are involved, as in the case you mentioned, it should appear as YYYY-MM. So, if a product has an expiration date of April 2001, it should be written as 2001-04. Unfortunately, now that we have entered the 21st century, there is a potential for confusion if a manufacturer uses only a two-digit designation for the year and doesn't follow the standard format. If so, a date such as the one you mentioned (01-02) could be mistaken for January 2002, when it really stands for February 2001. Most manufacturers prevent this from being a problem by using the appropriate standard notation and listing the complete four-digit year. In the future then, you will know if the proper designation is used if you see a date such as 2002-05. If you receive products from a company that lists only two digits for the year, you may want to let its customer service department know of the confusion this can cause. Hopefully, if they receive enough complaints, they will be persuaded to comply with the ISO standard.

(Col Charlton)

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60-03 Using Dentin Bonding Primers on Enamel

Question: Using dentin bonding agents is really confusing. I'm never sure if I should apply the primer to the enamel after etching or not. Instructions differ from product to product as to whether or not this is a good idea. Is there a general rule that I can use for all products?

Answer: Research has shown pretty conclusively that primers from most current-generation bonding products should be applied to etched, moist dentin. This helps the primer act as a link between the moist tooth surface and the bonding resin. The question is, does the primer do the same thing for enamel that it does for dentin. Specifically, does it improve the bond strength between the adhesive resin and the enamel as it does between resin and dentin? And if so, should the primer be applied to etched enamel that has been dried or left moist? This is a question with very practical applications because commonly in bonding situations, the enamel and dentin surfaces are juxtaposed. This makes it almost impossible to keep from applying the primer to enamel, even if you don't intend to. Unfortunately, research has been somewhat equivocal on this question. Some studies show that applying the primer to etched enamel reduces bond strength.^{1,2} Other studies indicate that the effect on bond strength is product specific: for some bonding agents, primer application to etched enamel increases bond strength while for others, it decreases bond strength.³⁻⁵ It is important to note that in all these studies, the primer was applied to etched, dried enamel. Is there a difference when the primer is applied to moist enamel?

Recently, a study was published that evaluated the effect of three dentin bonding primers on the bond strength of resin composite to moist and to dry etched enamel.⁶ In the study the multi-component products, Scotchbond Multi-Purpose (3M) and OptiBond FL (Kerr), were evaluated as well as the one-component product, Single Bond (3M). After measuring the bond strength to various combinations of groups, the results were that for the multi-component products, the bond strength was unaffected when primer was applied to etched, dried enamel. The bond strength was significantly increased when primer was applied to etched, moist enamel. For the one-component product Single Bond, moisture on etched enamel did not affect bond strength. The authors concluded that primer application to etched, dried enamel does not affect the bond strength, however the use of primer on etched, moist dentin is critically important to enhance bond strength.

In summary, on the basis of this recent research, it appears that primers should be used on enamel as well as dentin in all preparations for resin restorations. Temper this advice, however, with the recommendation that all products should be used as their manufacturers direct. When there is a question about any aspect of a product's application, always follow the instructions that are provided.

(Col Charlton)

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60-04 DIS Product Evaluation Process

Question: I've been thinking about becoming a product evaluator for DIS. Will it take up a lot of my time? Is there a bunch of paperwork I'll have to fill out? Will being an evaluator cost me or my clinic any money? How exactly is the program run?

Answer: Actually, the process of being a clinical evaluator of new products is relatively simple. Before we get into the actual clinical-user part of the evaluation, I'd like to give you a brief overview of how DIS evaluates products. If DIS decides to evaluate a new product, whether it is a new dental material or a piece of equipment, we obtain it from the manufacturer and perform appropriate laboratory tests to see if it meets appropriate military and/or international standards for performance. The product is then mailed to interested clinicians who are currently on our evaluator list. Along with the product they receive questionnaires and a cover letter describing the evaluation process. It is important to note that we evaluate only commercially available products: not prototypes or experimental products. Also, the clinical-user evaluations are evaluations of the handling characteristics of the dental material or piece of equipment. They are not clinical trials, so you will not be recalling patients and re-evaluating the quality or performance of a material. We are primarily interested in whether you liked or disliked the way the product handled and its various features.

After using the product for a period of from 3 to 6 months, each evaluator completes a questionnaire and returns the questionnaire to DIS. We like to have a minimum of two clinicians use the product at each facility. Our unspoken policy here is the more evaluators, the merrier; that way we get as broad a range of opinions as possible. If the item being evaluated is a piece of equipment, it does need to be returned to DIS or the manufacturer. If the item is a material or other type of consumable, it does not. DIS then takes the results of the laboratory and clinical-user evaluations and generates a final report for our newsletter, web site, and the manufacturer.

Many of our evaluators have told us they really enjoy being involved in the process. It gives them a chance to use state-of-the-art materials and equipment at no cost to their clinics. They also have said they like having a chance to give their opinions about the new products they are trying. If being an evaluator sounds interesting to you or if you want additional information, please contact me via e-mail and I will provide additional information to you.

(Col Charlton)

60-05 Commercial Products Approved for A-dec Dental Unit Waterlines

Question: Has the A-dec Company recommended any commercial products for the chemical treatment of their dental unit waterlines?

Answer: Yes, A-dec recently recommended two products, UltraKleen (alkaline peroxide), and Bio2000 (chlorhexidine gluconate) for chemically treating waterlines in dental units that are equipped with an independent (i.e., separate water) system. Both UltraKleen (Sterilex Corporation, [800] 511-1659) and Bio2000 (Micylium Laboratories, [800] 489-8868) cost more than standard household bleach but have less potential for damaging dental equipment. Tests have shown that when used according to the printed instructions, both products are effective in cleaning dental unit waterlines and consistently reduce bacterial levels to meet the American Dental Association goal of 200 colony forming units of microorganisms per mL of water. In addition, the two products are easier to use than bleach. A-dec does, however, emphasize that bleach in a dilution of 1:10 is still a viable option.

(Col Bartoloni)

60-06 Everything You Always Wanted to Know about Gloves...But Were Afraid to Ask

Question: What are the most popular gloves used in dentistry and why are they so popular? What factors should I consider when choosing gloves?

Answer: Obviously, the practice of dentistry involves the use of our hands. As dental providers we are routinely exposed to bacteria, viruses, and other oral microbes from blood and saliva. To protect

ourselves, we wear gloves approximately 40 hours per week. The most common gloves currently used in dentistry are latex, nitrile, and vinyl. Nitrile and vinyl are referred to as synthetic gloves.

It is important to understand the differences between latex, nitrile, and vinyl with regard to their barrier properties, material strength, and potential weaknesses. Most dental procedures involve constant hand and finger movements which may weaken some synthetic materials. Also, specific dental-related chemicals, compounds, biocides, and chemical agents may weaken puncture resistance and glove strength, which can, in turn, compromise personal safety. If barrier integrity is compromised, exposure to pathogens (e.g., HIV, hepatitis) may occur.

The American Society of Testing and Materials (ASTM) has developed glove standards based on performance specifications. Latex, nitrile and vinyl have different strength, elongation, and thickness requirements, which shows how different they are from each other. See Table 1 for performance standards.

Table 1. Performance Standards for Different Glove Materials

Material	Applicable ASTM Standard	Thickness	Strength*	Elongation**
Latex	D3578	0.08 mm	14 MPa	700%
Nitrile	D6319	0.05 mm	12.5 MPa	500%
Vinyl	D5250	0.05 mm	9 MPa	300%

* How much pressure can be applied before rupture

** The length (%) a glove material stretches beyond its original length before it breaks

Appropriate glove selection requires that the user evaluate the conditions under which the glove will be used. It is important to understand and evaluate each glove material's durability as a barrier and its performance limits. The performance limits should be weighed against the perceived risk level. The following questions, for example, should be asked when choosing a glove material. Will there be contact with bodily fluids and the potential for bloodborne pathogen exposure? What is the hazard level? What is the procedure being performed? Will the procedure involve chemicals? Will the chemicals dissolve the glove material? Table 2 provides an overview suggesting limiting conditions for latex, nitrile, and vinyl gloves.

Table 2. Comparison of Glove Materials

	Latex*	Nitrile	Vinyl
Durability	Most durable, Highly resistant to punctures and tears; Good resistance to many chemicals**	Excellent durability; Highly resistant to punctures and tears; Effective against a wide range of chemicals**	Limited durability, Increased potential for punctures and tears; Of limited use with chemicals**
Indications for Use	Excellent choice for high-risk situations where exposure to bodily fluid may occur; Procedures requiring unrestricted hand and finger movement	Good latex alternative for high-risk situations; Excellent synthetic alternative for latex-sensitive individuals	Synthetic alternative for low-risk, short-term procedures; Procedures with limited exposure to body fluids

* **Warning:** Products containing natural rubber latex may cause allergic reactions. Individuals who are allergic to natural rubber latex should avoid these products.

** Request permeation test data from the manufacturer. The concentration of the involved chemical and the gloves' thickness affect permeation.

Another important point to remember is that all three glove types can potentially initiate glove associated reactions. The types of reactions and their etiologies vary. See Table 3 for an overview of glove-associated reactions.

Table 3. Glove-Associated Reactions

Reaction	Can Be Caused By	Specific Cause	Susceptible Population
Irritant contact dermatitis (Irritation)	Latex, nitrile, or vinyl	Chemicals, powder, soaps	Everyone
Allergic contact dermatitis (Type IV)	Latex, nitrile, or vinyl	Chemicals, powder, soaps	Only those with genetic predisposition
Immediate hypersensitivity (Type I)	Latex	Latex proteins	Only those with genetic predisposition

Use of powdered gloves can also affect staff members and patients. In addition to drying out our hands and causing skin irritation, the glove powder can also absorb chemicals and natural rubber latex proteins present on the gloves surface. When donning and removing gloves, we and our patients can be exposed to these chemicals/proteins through direct contact and/or by inhaling the airborne powder. This can result in breathing difficulties, potentially contributing to occupational, irritant or allergic asthma. Powder can also directly affect invasive dental procedures and provide nutrients to support microbial growth. This, in turn, can contribute to infection, trigger inflammation, and delay wound healing. Finally, glove powder left on contact surfaces can contribute to cross-contamination, something we always want to avoid in patient treatment.

In summary, when choosing a glove, we should evaluate the anticipated risk level (high, medium, low, or no risk), review the type and duration of procedure to be performed, examine the equipment to be used, and anticipate the potential for exposure to bodily fluids. We must ask ourselves whether a glove type will provide an effective barrier, whether it will maintain an intact barrier under repeated hand movement, and whether the glove can withstand chemical exposure.

The bottom line is that latex gloves are recommended for high-risk situations involving potential pathogen exposure. Nitrile is an excellent alternative to latex because it exhibits comparable barrier qualities; in addition, it is an excellent choice for latex-sensitive individuals. Vinyl gloves are appropriate for most low-risk, short-duration tasks. To reduce the potential for powder-associated complications, powder-free latex or synthetic gloves should be considered for all dental procedures.

(Col Bartoloni)

60-07 Dental Units on Federal Contract

Question: I just returned from a dental meeting and noticed how many different companies make dental units. Why is it that there are only three manufacturers of dental units on the federal contract? Having so few seems to really limit our choices.

Answer: The federal contracts for dental/medical equipment are awarded by the Defense Service Center in Philadelphia (DSCP). DSCP requires a dental manufacturer's equipment to meet certain specifications in order to successfully handle unique situations that may present in military environments. For instance, dental equipment must function successfully in overseas areas where the electrical power is of a different voltage than in the US. Also, equipment may be required to withstand conditions that are more rigorous than those usually encountered in the typical civilian dental practice. For example, dental units that are aboard Navy ships must be stable and secure so they are able to withstand forces experienced by a ship at sea.

The DSCP has several ways that it uses to insure that the dental units available to the military

meet the specific needs of the services. First, DSCP has written a Medical Procurement Item Description (MPID) that lists specific requirements that dental units must meet. These include design features, electrical safety requirements, and construction specifications. Second, the DSCP has the right to inspect the manufacturer's facility. Also, DSCP requires the manufacturer to supply all service documentation and to maintain service records for up to three years. Finally, DSCP requires the manufacturer to guarantee that it will have surge capability (i.e., that it will be able to provide a large number of dental units on demand).

As you can see, a manufacturer must exhibit good quality control and be able to document it for the company to be able to submit items for inclusion on the dental unit federal contract. It is important to note, however, that just because a particular dental manufacturer is not on the contract does not imply that his dental units are of poor quality. Often, manufacturers are not on the contract because they can not meet surge demands or they may have decided that the process involved in submitting their units for possible inclusion on the contract is too involved administratively or financially. At present three manufacturers (A-dec, Den-Tal-Ez, and Pelton & Crane) are on the contract.

(Lt Col Roberts)

WHAT'S NEW?

"WHAT'S NEW?" features recently-marketed dental equipment and materials. New and innovative products are marketed each month and DIS is unable to evaluate all of them. This section of the newsletter brings these products to your attention. Because DIS has not had the opportunity to evaluate these products, we cannot confirm manufacturers' claims about them. If you would like additional information about the products or are interested in evaluating them, please contact DIS.

Cavit LC is a light-cured version of the well-known temporary restorative material, Cavit. It is indicated for the temporary treatment of inlay and onlay preparations, sealing implant screw holes, temporary restorations, and for lining pre-formed temporary crowns and bridges. ESPE claims that Cavit LC has a heavy-body consistency that facilitates its placement and offers speed of use because it is command set. The material is supplied in opaque blister packs. Only the amount of Cavit LC needed for the particular purpose is removed from the pack; the rest can be saved by resealing it in the lightproof pack. ESPE America claims that Cavit LC can be placed in a 5-mm thickness and adequately light cured with a 20-second exposure to a standard curing light. For layers from 5- to 7-mm thick, a 40-second exposure is recommended. A box of Cavit LC (item number 044500) consists of three blister trays each with 5 individual doses. It is available from ESPE America at (800) 782-1571, (610) 277-3800, (610) 239-2301 FAX, or www.espeusa.com for \$49.99 (retail) and \$30.80 (government).

(Col Charlton)

YB Digital Wax Pot is a electrically-powered wax pot with a digital display. It has a temperature range of from 50 to 115 C (122 to 239 F) and is accurate to within 1 . Temperature is raised or lowered using two buttons. The unit is 4½" W X 4¾" L X 2" H, which the manufacturer claims, makes it very portable. It comes with an AC 110V/220V adapter and a Celsius to Fahrenheit conversion chart. The company notes that the wax pot is compatible with most coping and dipping waxes. The YB Digital Wax Pot can be purchased for \$190.00 (government and retail price) from Yard+Bird at (800) 662-5021, (312) 226-2412/2454, (312) 226-2480 FAX, or www.yates-motloid.com.

(MSgt Ryerson)

Interguard is a short stainless-steel band placed interproximally to prevent iatrogenic damage to adjacent tooth structure during preparation. Its manufacturer, Ultradent, claims it is particularly appropriate for tunnel preparations. As seen in the accompanying picture, it has curled ends to make it more stable after placement. One end also has a hole through which floss can be threaded for patient safety. The device comes in two heights, 4 mm (item number 1088) and 5.5 mm (item number 1098), and Ultradent notes that it can be withstand dry heat and autoclave sterilization. A plastic container of 20 Interguards costs \$32.95 (retail) and \$28.01 (government). It can be ordered from Ultradent at (800) 552-5512, (800) 842-9024 FAX, or www.ultradent.com.

(Col Charlton)

Ultradent recently marketed the **Jiffy** series of latch-type polishing brushes. The **Composite Polishing Brushes** come in regular and pointed versions and are both impregnated with silicon carbide polishing particles. The brushes are intended for reaching into the grooves, fissures, and interproximal areas of ceramic and resin composite restorations. Ultradent claims they can be autoclaved a limited number of times before they lose their integrity. The **Jiffy Goat Brush** is also made for polishing ceramic and resin composite restorations but is not impregnated with silicon carbide. The products can be ordered from Ultradent at (800) 552-5512, (800) 842-9024 FAX, or www.ultradent.com. Specific ordering information is listed below.

Product	Item Number	Number in Container	Retail Cost	Government Price
Jiffy Regular Brushes	850	10	\$44.50	\$37.83
Jiffy Pointed Brushes	1009	10	\$44.50	\$37.83
Jiffy Goat Brushes	1029	10	\$14.75	\$12.54

(Col Charlton)

Caliburs from Ultradent are precision depth-cutting burs for use in friction-grip handpieces. The vertically-cutting burs are 1 mm in width and come in four lengths: 0.4 mm, 0.9 mm, 1.4 mm, and 1.9 mm. Product instructions call for them to be used to cut perpendicularly into tooth structure until seated to the burs depth stop. Ultradent suggests they be used for excavation of partially subgingival caries and for initial tooth reduction for veneers, onlays, and crowns. Their shape suggests they may also be useful for preparing retentive grooves or slots. Ultradent claims they provide a high degree of control during cutting and help retract gingival tissue. The burs come two to a package and cost \$23.95 (retail) and \$20.36 (government). Item numbers for the 0.4 mm, 0.9 mm, 1.4 mm, and 1.9 mm burs are 1117, 1118, 1119, and 1109, respectively. They can be ordered from Ultradent at (800) 552-5512, (800) 842-9024 FAX, or www.ultradent.com.

(Col Charlton)

The **Biological Spill Kit**, marketed by HCLS, is claimed to be an easy-to-use kit that is capable of quickly eliminating the hazards of blood spills or other body fluid spills. The kit includes 325 grams of disinfectant powder, which is purported to solidify spills for safe and easy clean up. Also included is a pair of nitrile gloves, safety goggles, scooper and pan, disposal bags, and biohazard warning labels. The Biological Spill Kit retails for \$34.95 (no government pricing available) and can be ordered at (800) 829-4257, (734) 414-3400, (734) 414-3421 FAX, or by contacting HCLS through their web site (www.softscience.com/hcls).

(Lt Col Roberts)

The **3/4 HP Model Trimmer** is an 1800-rpm wet trimmer designed for heavy-duty use. It is equipped with a two-position stainless-steel work table that has 90-degree and 105-degree relief angles to the wheel. The coarse abrasive wheel is 12 inches in diameter and 1/4 inch thick. One special feature is a self-cleaning design that flushes slurry from the unit to prevent stone or plaster build-up. Its door is purported to be easy to open because it has a single clasp. The wheel is easily and quickly changed, Whip Mix claims, because it is retained by a single screw. It also has a convenient built-in shelf for lab case pans, a splash shield, and a water spray attachment. Safety features include an enclosed motor and a waterproof on/off switch. Also, the trimmer has a special "trip-to-off" safety switch that shuts the motor off if the door is opened during operation or if the power fails. The unit measures 15" W X 15 1/4" H X 13" D and is available in 115V/60Hz and 230V/50Hz versions. The retail price is \$1034.80 and the government price is \$768.25. The 3/4 HP Model Trimmer can be purchased from Whip Mix at (800) 626-5651, (502) 637-1451, (502) 634-4512 FAX, or www.whipmix.com.

(MSgt Ryerson)

The **Aquapres 2000** is a hydraulic pressure-curing unit designed for use with self-curing resins. The unit does not need electricity or compressed air to operate. Its internal diameter is 5 inches with an interior height of 5 inches. To operate the Aquapres 2000, it is filled with warm water, the appliance is placed inside, and the door is closed. The knob on the lid is then tightened until the desired pressure is achieved. The company claims that the unit maintains pressure for hours and is compatible with all self-curing resins. The Aquapres 2000 has an unconditional two-year guarantee. It is available from Lang Dental at (800) 222-5264, (847) 215-6622, (847) 215-6678 FAX, or www.langdental.com for \$247.50 (retail price) and \$175.00 (government price)

(MSgt Ryerson)

The **QuickCut Die Saw** is a hand-held, motorized die saw used to cut gypsum and epoxy models. It uses a thin, diamond-coated, 0.015-inch (0.38-mm), flexible, circular blade that allows the user to change cutting angles. Whip Mix claims that the unit's easy-to-manuever handle makes even hard-to-reach areas accessible. An adjustable cast holder allows 360-degree rotation. A spacer is provided that is used to secure quadrant casts in the holder. Dust is collected directly at the cutting surface by a vacuum tube located in the saw handle. The unit's 1½-inch-diameter (3.8-cm-diameter) vacuum connection attaches to any standard laboratory vacuum system. Two-handed operation is required for safety: either the left or right safety switch must be pressed to engage the motor which prevents the user from placing a free hand on the model surface during cutting. The saw blade rotates at 14,000 rpm. Two blades and a ten-minute instructional video are included with each unit. The device is 12" W X 16½" L X 17.5" H, weighs 15 lbs, and is available in 115V/60Hz and 230V/50Hz versions. The QuickCut Die Saw can be purchased from Whip Mix for \$1538.50 (retail price) and \$1007.10 (government price) by contacting (800) 626-5651, (502) 637-1451, (502) 634-4512 FAX, or www.whipmix.com.

(MSgt Ryerson)

The **Top Finisher System** from Cosmedent is advertised as being an all-inclusive kit for finishing and polishing enamel, resin composites, porcelain, and metal. The kit contains a wide assortment of FlexiDiscs in various grits for gross contouring and polishing of metal and resin composites. FlexiCups, Points, and Wheels and Felt FlexiCups and Points are included to provide easy access to gingival margins and curved surfaces for polishing. Interproximal diamond strips, called FlexiDiamond Strips, are used to begin the interproximal finishing process and are followed by FlexiStrips of various grits for final polishing. The Revitalizer Porcelain Polishing Kit is also included in the system and is used for polishing porcelain restorations. Porcelize, a two-grit diamond polishing paste is used with to produce a high luster on porcelain surfaces. Enamelize, also included in the kit, is then used to enhance this finish on porcelain as well as to polish metal and resin composite surfaces. The Top Finisher System (item number 405000) is available for \$355.00 (\$275 government price) from Cosmedent at (800) 621-6729 or www.cosmedent.com.

(Col Charlton)

EndoSeal!" is a two-paste (zinc oxide and eugenol) endodontic sealer for use with a traditional or warm gutta percha technique. The two pastes are dispensed simultaneously in proper proportions using an innovative syringe named TwoSpense!" . The pastes are then hand mixed and can be delivered into the root canal using a lentulo spiral or endodontic file, followed by the gutta percha master cone. Alternatively, the system includes disposable SpaTwist!" syringes that have an opening through one side of the barrel. Into this opening, the two pastes can be directly dispensed with the TwoSpense!" syringe. The pastes are mixed inside the syringe using a small spatula provided with the product. The mixed paste can then be delivered directly into the root canal through a 30-gauge Endo-Eze® metal tip. The EndoSeal!" Complete Kit (item number 849) contains 1 TwoSpense!" syringe, 20 SpaTwist!" syringes, 20 Capillary!" Tips (extremely small, plastic dispensing tips), 20 30-gauge tips, spatulas, and mixing sheets. EndoSeal!" , which costs \$59.25 (retail) and \$50.36 (government), can be ordered from Ultradent at (800) 552-5512, (800) 842-9024 FAX, or www.ultradent.com.

(Col Charlton)

The **Omni-Matrix** from Ultradent is a disposable matrix retainer with pre-loaded band. It was rated by DIS as Acceptable in the Sep 1994 newsletter and has since been modified. Many of the disadvantages noted for the original version have since been corrected. The product consists of a single-piece, plastic, lightweight retainer loaded with a 0.002" mylar bands or metal band. The metal bands are available in two thicknesses: 0.0015" and an ultra-thin 0.001." A 0.0015" pedo size metal band that is about 1-mm shorter than the other bands is also available pre-loaded in a separate retainer. A four retainers have color-coded knobs to make it easy for the users to know which retainer/band combination they are using. The Omni-Matrix Intro Kit (item number 1105) includes 16 retainers with 0.001" bands, 16 retainers with mylar bands, 8 retainers with pedo bands, and 8 retainers with 0.0015" metal bands. It is available for \$39.75 (\$33.79 government price) from Ultradent at (800) 552-5512, (800) 842-9024 FAX, or www.ultradent.com.

(Col Charlton)

The Palodent System from Darway is a sectional matrix used during the placement of a amalgam, resin composite, and temporary restorations. The product was evaluated and rated Acceptable in DIS 56-14 but additional items are now available to enhance its usefulness. As evaluated, the Palodent System consisted of a BiTine ring and one size of sectional matrix (see figure). Our evaluation indicated that the ring produced effective pre-placement wedging as well as matrix contouring. It was also judged to provide better proximal contours for posterior resin composite restorations than traditional matrices. One of the problems noted was that the smooth ring was awkward to place with rubber dam forceps. One new addition to the kit has been made to address this difficulty. A new ring, the BiTine.ii (see figure), has two sockets for engaging the forceps. The ring also has a longer loop that Darway claims improves visibility. The other change to the kit is the addition of two different sizes of matrix (see figure): one is smaller for restorations in primary teeth and the other is larger for deep restorations. The Master's Kit version of the system (item number MK301) contains 4 BiTine rings, 2 Bitine.ii rings, 100 standard matrices, 50 mini-matrices, and 50 Palodent Plus (ie, large) matrices. It is available from Darway at (650) 548-9261, (650) 548-9262 FAX, or www.palodent.com for \$88.00 (retail/government).

(Col Charlton)

DIAGNOdent is KaVo America's laser caries diagnosis system. It is a tabletop unit that features a hand-held detection probe, front touchpad controls, and a digital numeric readout. The manufacturer states that the DIAGNOdent uses light of a defined wavelength to help detect and quantify demineralized tooth structure. KaVo America maintains that the DIAGNOdent is accurate even when the outer tooth surface appears intact and will assist clinicians in making better early treatment decisions. The DIAGNOdent is available from KaVo America for a retail price of \$2600 (\$1690 government price) at (888) 528-6872, (847) 550-6800, (847) 550-6825 FAX, or www.kavousa.com.

(Lt Col Roberts)

The **Supreme Scissor Base** is a portable aluminum dental chair marketed by DNTLworks Equipment Corporation. The chair has integral arm slings with a double-articulating headrest that are claimed to help provide patient comfort and proper head positioning. The chair's height can be adjusted from 18 to 31 inches and is accomplished before the patient is seated. The chair features a backrest that can be positioned from 80 degrees upright to supine through the use of a pneumatic pump adjustment. The unit weighs 42 pounds and folds for transport. The Supreme Scissor Base is available from DNTLworks Equipment for a retail price of \$2786 (\$2229 government price) by contacting (800) 847-0694, (303) 693-1410, (303) 693-6189 FAX, or www.dntlworks.com.

(Lt Col Roberts)

The **Airbrator** is a single-use, air-abrasion handpiece marketed by Edge Dental. The device attaches via a connector to existing dental unit air lines (60 psi recommended) and is said to have a patented delivery system that maintains particle flow but minimizes powder overspray. The Airbrator is claimed to have certain advantages over traditional compressor-driven air-abrasion units. Among these are that it requires no maintenance, no refilling, and is disposable. Also, because it is self-contained, it is simple to set up and there is no bulky equipment that accompanies it. The Airbrator is available in three grades: 1) Light-Performance Abrasion Polishing and Cleaning (sodium bicarbonate powder) for removing stains and cleaning; 2) Medium-Performance Abrasion for precise abrasion; and 3) High-Performance Abrasion for comprehensive tooth preparation. The manufacturer states that both the Medium- and High-Performance units use 50-micron aluminum oxide. The cutting efficiency of the High Performance is said to result from using aluminum oxide particles that have more jagged edges produced by a different milling process. The Airbrator starter kit includes three High-Performance Abrasion handpieces, a Medium-Performance handpiece, two Light-Performance handpieces, and a handpiece hose connector. Individual units may be purchased separately or in boxes of ten. The Airbrator Starter Kit retails for \$84.00, individual handpieces are \$14.95 each, and a box of ten handpieces costs \$99.95. Government prices have not yet been established. Further information is available from Edge Dental at (800) 873-6070, (231) 946-6070, (231) 922-2274 FAX, or www.edgedental.com.

(Lt Col Roberts)

NTI Supercoarse Turbo Diamonds are burs that feature a layer of diamonds that are bonded with defined grit spacing that leaves diamond-free zones. These diamond-free areas and a heavier concentration of diamond particles at the bur's tip are said to promote optimal grinding performance with minimal heat and very little clogging. The burs are available in 36 shapes in both regular-length friction-grip and short-shank friction-grip sizes. NTI Supercoarse Turbo Diamonds are said to cut rapidly and leave a smoother axial wall than a leading competitor's bulk-reducing diamond. The burs are manufactured to ISO 9001 standards. They are available in packs of five for \$47.50 (retail) and \$29.50 (government) from Axis Dental at (800) 355-5063, (972) 273-2720, (972) 257-3647 FAX, or www.axisdental.com

(MSgt Ryerson)

Logic Sets are bur blocks that can be ordered with various combinations of diamonds, carbides, and polishers needed to perform a wide variety of clinical and laboratory procedures. Most of the sets are available in autoclavable aluminum blocks or non-autoclavable resin. The aluminum blocks are available in teal, blue, black, and white. Some of the available pre-packaged bur block sets include Ceramic Crown Preparation, Acrylic Adjustment, Intra-oral Porcelain Polishing, and Composite Contouring and Finishing sets. Logic Sets are customizable by procedure for individual clinics. The procedure and clinic name are etched on the block cover. Entire sets or single burs can be reordered. Individual part numbers are engraved on the block to facilitate replacement of individual burs. Kit prices range from \$55.95 to \$195.95 (retail) and \$34.00 to \$126.00 (government), depending on the particular set. Logic Sets can be purchased from Axis Dental at (800) 355-5063, (972) 273-2720, (972) 257-3647 FAX, or www.axisdental.com. More information is also available via e-mail at: ltucker@axisdental.com.

(MSgt Ryerson)

Flexi Wedges are a new type of interproximal wedge marketed by Garrison Dental. The Flexi Wedges are made of an elastic material that has a matte finish and ribbed, directional, retentive ridges that are said to prevent the wedges from backing out after placement. They feature a graduated side depth that is purported to allow them to flex and adapt to anatomical irregularities, thereby helping to prevent matrix band gaps in interproximal areas. Flexi Wedges also have a concave gingival surface that the manufacturer claims places less pressure on the gingiva and provides more force for tooth separation. Flexi Wedges are available in five sizes in complete kits and in replacement packages. A Complete Flexi Wedge Kit contains 400 wedges of various sizes and costs \$77.00 (retail); three packages of Flexi Wedge Refills are available for \$57.00 (retail). Government prices are not yet available. Flexi Wedges can be obtained from Garrison Dental at (888) 437-0032, (616) 842-2244, (616) 842-2430 FAX, or www.garrisonsdental.com.

(Lt Col Roberts)

Prepstart is a tabletop air abrasion unit sold by the Danville Engineering Company. It is said to offer the performance and control of larger air abrasion units at a lower cost. Prepstart is powered by the typical 60-psi air supply from a standard dental unit and features three-stage air filtration, adjustable abrasive flow, and adjustable pressure control. It is important to note that you must have the airline attachment that is required for Danville's Microetcher to attach the Prepstart to your dental unit. The unit can use either 27- or 50-micron aluminum oxide powder which is channeled through handpiece that is plugged into the front of the unit. If higher cutting pressure is desired, Danville Engineering also offers the **PowerPlus Air Booster** which, the company claims, increases 60-psi dental unit air pressure to 135 psi without the use of a compressor. The PowerPlus is said to increase air pressure by using a unique internal venturi design that requires no electrical connections. The Prepstart costs \$2695 (retail) while the PowerPlus Air Booster is available for \$695 (retail). No government prices are currently available. Further information may be obtained from Danville Engineering at (800) 827-7940, (925) 838-7940, (925) 838-0944 FAX, or via e-mail at info@daneng.com.

(Lt Col Roberts)

CX-Plus Glasionomer Cement is a new cement for the permanent cementation of crowns, inlays, bridges, and orthodontic appliances. Its manufacturer, Shofu, claims that it provides an extended working time (i.e., 3½ minutes) with a snap set. Also, it is purported to be very easy to mix and handle, have high

flowability, as well as reduced solubility and adequate radiopacity. The advantages of increased working time, lower viscosity, and a snap set are said to result from a special SLC (silicone oxide layer coating) that controls the penetration of the glass-ionomer liquid into the glass particles. Compared to other popular glass-ionomer luting cements, Shofu claims that CX-Plus has a working time at least 30 seconds longer than that of Ketac-Cem and Fuji I and has a compressive strength comparable to that of Fuji I. The cement is available in bulk form (i.e., bottle of powder and bottle of liquid) as well as injectable capsules. A box of 50 injectable capsules (item number PN 1186) costs \$134.50 (retail) and \$73.98 (government). The product is available from Shofu at (800) 827-4638, (650) 324-0085, (650) 323-3180 FAX, or www.shofu.com.

(Col Charlton)

One Coat Bond is a light-cured bonding agent from the Coltene Whaledent Company. The product differs significantly from other currently-marketed bonding agents in that it is purported to be solvent free. The main advantage of this claimed by Coltene is that the solution has a consistent viscosity because it contains no highly volatile solvent such as acetone or alcohol. Coltene also claims that the product covers in only one coat and eliminates post-treatment sensitivity. One Coat Bond is recommended for bonding to enamel, dentin, noble and base-metal alloys, ceramics, composites, compomers, and glass ionomers. The product is applied following acid etching for 15 seconds with a 15% concentration of phosphoric acid. Following its 20-second active application, the bonding agent is light cured for 30 seconds. A kit of One Coat Bond (item number C7880) contains two syringes of acid etchant, one syringe of bonding agent, syringe tips, and applicator brushes. The kit costs \$60.31 (retail and government) and is available from Coltene Whaledent at (800) 225-9382, (201) 512-8000, (201) 529-2103 FAX, or www.coltene.com.

(Col Charlton)

Seal & Protect is a new product from the Dentsply/Caulk Company for treating dentin hypersensitivity. Dentsply claims that the product is able to relieve sensitivity from exposed dentin for up to 6 months, five times longer than other desensitizing products. Dentsply recommends a two-coat application of Seal & Protect and claims that it provides a wear-resistant surface because it contains extremely small filler particles ("nanofillers"). The product is also said to contain and release fluoride for its beneficial effects. Product literature notes that patients can eat, drink, and brush immediately following treatment. The Standard Kit (item number 658001) contains two bottles of the sealant, a brush handle, disposable brush tips, a dispensing well, and illustrated instructions. The product is available for \$166.65 (retail) and \$100.00 (government) from Dentsply/Caulk at (800) 532-2855, (302) 422-4511, (800) 788-4110 FAX, or www.caulk.com.

(Col Charlton)

Aquasil DECA is an innovative packaging concept from the Dentsply/Caulk Company for their Aquasil addition silicone impression material. The product consists of a hard, plastic cartridge that makes the impression material compatible for use in dynamic mixing machines such as the Pentamix 2 (ESPE America, see *DIS* 59-16). Previously, only impression materials made by ESPE were provided in a packaged form that could be used in the machine. When Aquasil DECA is ordered, a dispensing cartridge is provided as well as the foil containers of impression material. Attached to the foil containers is a self-activating cap which eliminates the need to manually cut the impression material bags open before use. This differs from the ESPE impression material ordered for the Pentamix, which is packaged in metal "sausage" bags without an attached cap. The ESPE bags are manually cut, placed into the cartridge, and then capped before being inserted into the Pentamix machine. Dentsply/Caulk claims their packaging method is simpler for the user. Various combinations of the different viscosities of Aquasil are available for purchase in the DECA form. To give readers an idea of cost, the following form has been selected: the Aquasil DECA Monophase & LV Introductory Kit contains foil packs of the base and catalyst monophase material (for tray use), a DECA cartridge, an automix cartridge of Aquasil LV (for syringe use), an automix dispenser gun, mixing tips for the DECA cartridge and gun, and a bottle of tray adhesive. The kit (item number 678751) costs \$178.30 (retail) and \$107.00 (government) and is available from Dentsply/Caulk at (800) 532-2855, (302) 422-4511, (800) 788-4110 FAX, or www.caulk.com.

(Col Charlton)

Variolink II is a dual-cured resin cement from the Ivoclar/Vivadent Company. *DIS* evaluated the product

and reported favorable on it in *Dental Items of Significance* 56-25, however since that time it has been modified in several important ways. The original product came in 5 shades while the new product has an additional shade, bleach extra-light. A new transparent catalyst has also been added in high and low viscosities. Unlike before, the pastes are all now packaged in Luer-Lock Push Syringes which, Ivoclar claims, gives users better control when dispensing the materials. The cement is provided with Ivoclar's newest dentin bonding agent, Excite (evaluated in *D/S* 60-??). The Variolink II Cementation System Package (item number 558946) contains 6 syringes of cement base paste, 4 syringes of cement catalyst paste, a syringe of 37% phosphoric acid etchant, a syringe of separating agent, silane, Excite bonding agent, and accessories. It is available for \$350.00 (retail) and \$135.00 (government) from Ivoclar/Vivadent at (800) 533-6825, (716) 691-0010, (716) 691-2285 FAX or www.ivoclarna.com.
(Col Charlton)

Astropol, from Ivoclar, is a new finishing/polishing product for hybrid and microfill resin composites and for Ceromer!" restorative materials. (Ceromer!" is a trademark name for Ivoclar's line of resin-based restorative materials such as Tetric-Flow, Tetric Ceram, and Targis). The system consists of latch-type rubber points (small and large), cups, and disks in three grits. The F (Finishers) grit is impregnated with silicon dioxide and is used to remove excess resin and pre-polish the restoration. The second grit, P (Polishers), also contains silicon dioxide and is used for producing a high gloss on the surface of microfills. The last grit, HP (High Polishers), contains silicon dioxide and fine diamond particles to produce a high luster on the surface of hybrid resin composites. Ivoclar claims several advantages for this system compared to other currently-available finishing/polishing products. First, the variety and size of tips provides clinicians with access to difficult-to-reach surfaces. Secondly, the tips do not contain metal hubs or centers that can mar the surface of the restoration. Finally, they are autoclavable for repeated uses. The Astropol Assortment Package (item number 557625) contains 24 finishers/polishers (12 of grit F [3 in each shape], 8 of grit P [2 in each shape], and 4 of grit HP [1 in each shape]). The product is available for \$99.00 (retail) and \$35.50 (government) from Ivoclar North America at (800) 533-6825, (716) 691-0010, (716) 691-2285 FAX or www.ivoclarna.com.

(Col Charlton)

FROM THE LITERATURE

Periodically, articles appear in the literature that present clinically useful information or evaluate the performance of a material or piece of equipment. Because DIS believes that this type of research is of value to clinicians, we present a brief description of these articles to make you aware of them. The complete citation is provided so you can obtain the article if you are interested in reading it in its entirety.

HYBRID VS. MICROFILL: WHICH COMES OUT THE WINNER?

Two-year clinical comparison of a microfilled and a hybrid resin-based composite in non-carious class V lesions. Browning WD, Bracketed WW, Gilpatrick RO. Oper Dent 2000;25:46-50.

It has been suggested that the retention of resin composites in Class V lesions is affected by the rigidity (ie, modulus of elasticity) of the material. Many believe that a more flexible resin composite such as a microfill, flexes when the tooth flexes and this causes it to be retained better than a more rigid resin like a hybrid. The purpose of this double-blind study was to evaluate the retention rate of a microfill and a hybrid resin composite in Class V lesions. Thirty pairs of restorations were placed in noncarious Class V lesions, one with Silux Plus microfill (3M) and the other with Z100 hybrid (3M). All restorations were placed with Scotchbond Multi-Purpose Adhesive (3M). Evaluations were performed at baseline, 6, 12, 18, and 24 months. **The researchers found no difference between the retention rates for the two types of resin composites.** Eighty-nine percent of the Silux Plus and 86% of the Z100 restorations had been retained at the two-year point. **The authors concluded that these findings bring into question the role that a material's stiffness plays in its retention in noncarious Class V lesions.**

JUST CURE IT

Friedl KH, Schmalz G, Hiller KA, Märkl A. Marginal adaptation of class V restorations with and without softstart-polymerization. Oper Dent 2000;25:26-32.

Different visible light curing modes have been proposed to attenuate polymerization shrinkage of photo-activated restorations. This study tested the influence of softstart polymerization (polymerization first at a low light intensity followed by a final cure at a high light intensity) on the marginal integrity of selected compomers and resin composite restorations. Sixty standardized Class V cavities were prepared: twenty preparations were restored each with Prime & Bond 2.1 + Spectrum resin composite, Prime & Bond 2.1 + Dyract compomer, and OSB primer + Hytac compomer. Ten restorations of each group were cured with either a conventional visible light cure (800 mW/cm² for 40 seconds) or a softstart visible light cure (150 mW/cm² for 10 seconds followed by 800 mW/cm² for 30 seconds). Margins were evaluated before and after thermomechanical loading, and microleakage was assessed using dye penetration. **Under conditions of this study, softstart polymerization using a very low starting irradiance did not improve the marginal adaptation of the compomers or resin composite.**

CLASS II RESIN COMPOSITES: HOW WELL DO THEY REALLY PERFORM?

A five-year clinical evaluation of Class II composite resin restorations. Köhler B, Rasmusson C-G, Ödman P. J Dent 2000;28:111-116.

Although resin composites have been used for many years in dentistry, too few studies have been published that evaluate their clinical performance over a meaningful period of time. This article is a five-year study of the clinical performance of two resin composites placed by general practitioners. Sixty-three Class II restorations were placed in 45 patients using Superlux Molar (DMG) and P-50 (3M). Cavity designs were either adhesive (ie, conservation) or conventional. Patients were evaluated at baseline and at one week, three years, and five years. Using the USPHS guidelines, the following characteristics were evaluated: proximal contact, marginal adaptation, marginal discoloration, anatomic form, color match, and secondary caries. Wear measurements were also made using the Leinfelder technique. At the five-year recall, 51 restorations were available for examination. Over that time period, a total of 16 had failed for a failure rate of 27.6%. Failures did not specifically relate to material, tooth type, or cavity design. The most common causes for failure were recurrent caries (7 restorations) and marginal defects (4 restorations).

Mean five-year wear rates for Superlux Molar and P-50 were 167 microns and 158 microns, respectively. **The authors concluded that the overall clinical performance of posterior resin composites is promising, however the high failure rate due to caries suggests a need to monitor and manage caries risk factors to maximize service life of these restorations.**

A LITTLE ESTROGEN MAY NOT GO A LONG WAY

Fung EYK, Ewoldsen NO, St. Germain HA, Marx DB, Miaw C-L, Siew C, Chou H-N, Gruninger SE, Meyer DM. Pharmacokinetics of bisphenol A released from a dental sealant. *J Am Dent Assoc* 2000;131:51-58.

Reports have been published regarding potentially estrogenic bisphenol A (BPA) that may be released from dental sealants. This study evaluated the rate- and time-course of BPA released from Delton Opaque Pit and Fissure Sealant (Dentsply) when applied at a dose of eight milligrams of sealant per tooth to 40 patients. Saliva and serum samples were collected on patients who had not had prior sealant placement. The samples were collected before sealant placement and at one hour, three hours, one day, three days, and five days after sealants were placed. High-pressure liquid chromatography was used to determine the amount of BPA in all specimens with detection sensitivity at five parts per billion (ppb). Results found small BPA amounts (5.8-105.6 ppb) in some saliva specimens collected at one and at three hours. BPA was not detectable beyond three hours in any serum specimens. **This study showed that BPA released orally from dental sealants may not be absorbed or may be present in undetectable amounts in systemic circulation. The concern about potential estrogenicity of sealants may be unfounded.**

NO NEED TO DO IT ROUTINELY

Mahler DB, Engle JH. Clinical evaluation of amalgam bonding in class I and class II restorations. *J Am Dent Assoc* 2000;131:43-49.

Many clinicians advocate using adhesive agents with amalgam to enhance retention of the restoration as well as reduce microleakage, postoperative sensitivity, and marginal deterioration. Although *in vitro* testing indicates a certain degree of efficacy, the validity of amalgam bonding requires confirmation in the clinical environment. This study involved traditional Class I and Class II bonded and unbonded amalgam restorations placed in 76 patients. Panavia 21 was used as the bonding agent with Aristaloy CR and Tytin amalgams. After three years of clinical service, there was no difference in postoperative sensitivity or marginal deterioration between bonded and unbonded amalgam restorations for either amalgam. **The merit of using adhesive bonding agents for traditional Class I and Class II amalgam restorations was not demonstrated in this three-year clinical study.**

DENTAL UNIT WATERLINES, AGAIN

Dental unit waterlines: approaching the year 2000. ADA Council on Scientific Affairs. *J Am Dent Assoc* 1999;130:1653-1664.

In December 1995, the American Dental Association (ADA) adopted the ADA Statement on Dental Unit Waterlines. It challenged the research community and dental manufacturers to improve the design of dental units to reliably deliver treatment water of higher microbiologic quality by the year 2000. The goal specifically was 200 colony-forming units of heterotrophic, mesophilic bacteria per milliliter of unfiltered output water.

To date there is no published evidence of a serious public health risk from biofilm-contaminated dental unit water for immunocompetent individuals. However, there are potential problems for the immunocompromised patients. Today there exists a need for continued research to evaluate the risks that biofilm poses when present in dental unit waterlines. The ADA emphasizes that further steps need to be taken to improve dental unit water quality because water of poor microbiological quality is inconsistent with patient expectations.

This article is an excellent review of biofilm formation and its resulting potential health effects. The article also presents the most current available methods for reduce microbe contamination in dental unit water and discusses potential avenues for future research.

NOT DENTAL UNIT WATERLINES AGAIN!

Dental unit waterline antimicrobial agents effect on dentin bond strength. Roberts HW, Karpay RI, Mills

SE. J Am Dent Assoc 2000;131:179-183.

Several studies have shown that the bacterial levels in water coming out of dental units often exceed recognized the limit for potable water (i.e., 500 colony-forming units per milliliter [cfu/mL]). This is usually caused by biofilm that contaminates waterlines in the units. The American Dental Association has asked the dental industry to develop equipment and methods to achieve a goal of 200 CFU/mL by the year 2000. Methods already being used include the use of an independent (i.e., separate) water reservoir with periodic chemical disinfection or continuous antimicrobial agent application to reduce bacterial levels.

The continuous introduction of a chemical agent offers some advantages over periodic chemical disinfection. One important advantage is that it reduces bacteria levels in coolant and irrigant water, as well as in aerosols generated during dental procedures. Some clinical procedures may be adversely affected by the use of water that contains a chemical disinfectant, however. For example, tooth surfaces to be bonded with a dentin bonding agent may be negatively affected by disinfecting chemicals. The purpose of this study was to attempt to determine if such a negative effect occurred. A fifth-generation dentin bonding agent was used to bond composite cylinders to dentin surfaces after the dentin had been rinsed with water that contained one of four types of antimicrobial agents. The bonded specimens were then shear tested and bond strengths were compared.

All the selected antimicrobial agents were found to reduce dentin bond strengths. A diluted mouthrinse and chlorhexidine significantly reduced dentin bond strength compared to sodium hypochlorite and citric acid. **The authors concluded that dentists should be aware of this potential adverse effect when antimicrobial agents are used to continuously treat dental unit waterlines.**

GO POWDER-FREE

Effect of powder-free latex examination glove use on airborne powder levels in a dental school. Hermes CB, Spackman GK, Dodge WW, Salazar A. J Dent Educ 1999;63:814-820.

The powder found on latex examination gloves can act as an airborne carrier of natural latex allergens which can cause staff and patients to experience cutaneous, conjunctival, and/or respiratory reactions. This is a major concern in dental schools due to extensive use of latex examination gloves. The purpose of this study was to measure airborne powder levels associated with the use of powder-free latex examination gloves in a dental school clinic. Prior to the study, the dental clinic used powder-containing gloves. Other study objectives were to assess user acceptance of the powder-free gloves and to determine the financial impact of converting the dental school from powder-containing gloves to powder-free gloves.

Air samples were taken in the dispensary and one treatment room in a student clinic from fifteen to thirty minutes before a normal clinic session and 1.5 hours into the session. Air samples were analyzed for particulate counts of powder. User acceptance of two glove types was assessed using a written survey. Historical financial data were used to estimate the cost of converting to a powder-free environment.

Results indicated that both the dispensary and the treatment room exhibited a considerable reduction in airborne particulate counts of powder during the use of the powder-free gloves. Powder counts returned to the usual high levels when powder-containing gloves were reintroduced. When powder-containing gloves were used, the powder levels, which were low initially, rose during the course of the session. Results of the written survey showed a high user acceptance of powder-free gloves. The estimated cost for converting the dental school to a powder-free environment was \$13,943.

DOES BULK CURE REALLY WORK?

Effectiveness of polymerization in composite restoratives claiming bulk placement: impact of cavity depth and exposure time. Yap AUJ. Oper Dent 2000;25:113-120.

Several new resin-based restorative materials have been introduced for the restoration of posterior teeth. Their manufacturers claim they can be placed in thicknesses of up to 5 mm and light cured. This is an unusual claim because no previously marketed resin composite material has been adequately light cured in thicknesses greater than 2 mm. This study used microhardness to evaluate the depth of cure of two "bulk placement" restorative materials, Ariston pHc (Vivadent) and SureFil (Dentsply/Caulk). Thicknesses of 2 mm, 3 mm, and 4 mm of each material were placed and light activated using a Spectrum light unit (Dentsply) with an irradiance of 421 mW/cm². Hardness on the top

surface (closest to the light) and the bottom surface (surface away from light) were measured and a ratio used to assess depth of cure. Results indicated that neither Ariston pHc nor SureFil was adequately cured in a depth greater than 2 mm. **The author recommends that these materials be placed in increments no greater than 2 mm to provide uniform and maximum polymerization.**

WHY DO GALLIUM RESTORATIONS CAUSE TOOTH FRACTURE?

Long-term corrosion of a Ga-containing restorative material. Sarkar NK, Moiseyeva R, Berzins DW, Osborne JW. Dent Mater 2000;16:97-102.

Because of the environmental concerns associated with the use of mercury in dental amalgam, gallium has been used as a mercury substitute. Recently, gallium-containing restorative materials have been introduced for the restoration of posterior teeth. Although laboratory tests have produced favorable results, clinical trials of these alloys have had mixed results. The primary problems have been post-treatment sensitivity and tooth fracture, which some believe is related to an excessive expansion of the material. This study was done to test the hypothesis that long-term corrosion is the cause of the delayed expansion. This laboratory study involved the use of two types of corrosion tests that were performed on cylinders made of Galloy (Southern Dental Industries), a gallium-containing restorative material. The tests were conducted in two kinds of solution: saline with chloride (to simulate saliva) and saline without chloride. After the tests were done, internal and external corrosion of the cylinders was measured using optical microscopy. Results indicated that Galloy corroded massively, both internally and externally, in the saline with chloride solution. **The authors concluded that excessive expansion caused by corrosion contributes to post-treatment sensitivity and tooth fracture associated with the use of this type of restorative material.**

ADULT PERIODONTITIS RISK FACTORS

Not all patients are the same: Systemic risk factors for adult periodontitis. Wilson TG. Gen Dent 1999;47:580-588.

Adult periodontal disease is caused by bacterial plaque. Local and systemic risk factors, however, modify the degree to which a given patient's periodontal structures react to the destructive effects of plaque. This article discusses three primary risk factors that exacerbate periodontal disease.

Smoking - The number of years smoked and the number of cigarettes smoked per day are related to an increased susceptibility to periodontitis. Response to periodontal treatment is not as favorable in smokers as in nonsmokers. While the mechanism is not fully understood, an increased susceptibility to periodontal disease in smokers is probably related to the effect smoking has on blood vessels, connective tissues, and immune cells.

Diabetes Diabetics have impaired polymorphonuclear leukocyte function and do not cope well with infections. Poorly-controlled diabetes is a greater risk factor than well-controlled cases.

Genetics Recently, a gene group has been discovered that is related to the amount of tissue destruction that results from a bacterial challenge. These genes are related to the production of the inflammatory mediator Interleukin-1 (IL-1). An overproduction of IL-1 in genotype-positive patients contributes to periodontal breakdown. A finger stick sample of blood can be sent to specific laboratories to determine if a patient is positive for this genotype.

This article is a good discussion of the role smoking, diabetes, and a recently discovered genetic marker play as risk factors in a patient's periodontal response to bacterial plaque.

GENERAL DENTISTRY

60-08 Excite Advanced Adhesive Technology

(Project 99-35)

Excite is a fifth-generation (i.e., "one-component"), light-activated dentin bonding agent marketed by the Vivadent Company. It is recommended for direct bonding of resin composite, Ceromer!" , and compomers to enamel and dentin. Ceromer!" is a trademark term to describe a type of resin composite restorative material made by Vivadent. Excite is also indicated for use as a dentin treatment prior to luting a ceramic or resin restoration with a light-activated resin cement.

According to the manufacturer, Excite is distinguished from other "one-component" bonding agents in that it contains extremely small (i.e., 12-nanometer) filler particles. Because they are so small, the manufacturer claims that the filler particles can penetrate into the demineralized dentin and contribute to formation of the hybrid layer. Another purported advantage of their small size is that they do not contribute significantly to the adhesive's film thickness. This is an important consideration when using a dentin bonding agent prior to cementing an indirect restoration. Other purported advantages of Excite are that it covers completely with only one coat, eliminates post-treatment sensitivity, and is acetone-free. Using an ethanol solvent supposedly makes Excite's application more technique tolerant because it is less volatile than acetone and is not as greatly affected by degree of dentin moisture. Although Excite is described as a "single-component" product, it is applied only after etching the enamel and dentin with phosphoric acid.

The first step in applying Excite is to etch the enamel for 15 seconds and the dentin for 10 seconds with Total Etch, a 37% phosphoric acid etchant. The etchant is removed with thorough rinsing and the tooth structure is lightly dried with air or blot dried. Excite Adhesive is generously applied to the tooth structure using a scrubbing motion for 10 seconds, gently air dried for 3 seconds, and light activated for 20 seconds. The restoration is then placed using standard techniques.

Excite is available in bottle form and in innovative SoftTouch!" Unit Dose Vessels which are said to enhance infection control because they are intended for single use. The SoftTouch!" Unit Dose Vessels are supplied with plastic finger clips similar to the rings worn by prophylaxis technicians for holding prophylaxis paste.

Manufacturer:

Ivoclar North America
175 Pineview Drive
Amherst, NY 14228
(800) 533-6825
(716) 691-0010
(716) 691-2285 FAX
www.ivoclarna.com

Suggested Retail Price:

\$99.00 Excite Advanced Adhesive Technology Single Dose Introductory Package (item number 6556609) contains:
-one 2-g syringe of Total Etch (37% phosphoric acid etchant)
-fifty 0.1-g SoftTouch!" Unit Dose Vessels
-fifty plastic applicators
-five finger clips

Government Price:

\$40.00 Excite Advanced Adhesive Technology Single Dose Introductory Package (item number and contents as listed above)

ADVANTAGES:

- + Produces strong bond to moist dentin (26.1 MPa).
- + Application process is simple and straightforward.
- + Extremely fast to apply.
- + Covers tooth structure in only one coat.
- + Available in single-dose containers that enhance infection control and make clean-up easy.
- + Can be used for direct and indirect bonding.
- + Instructions accurately describe product indications and use.
- + Is provided with excellent, graphics-only, laminated instruction card.
- + Expiration dates and lot numbers are stamped on individual components.
- + No offensive odor.
- + Recommended storage conditions are provided on box.
- + Is provided with a Material Safety Data Sheet (MSDS).

DISADVANTAGES:

- Not intended for all types of bonding (e.g., amalgam bonding, porcelain repairs).
- Some users thought the product was not as effective as other bonding agents in reducing/preventing thermal sensitivity.

SUMMARY AND CONCLUSIONS:

Excite is one of the few fifth-generation (ie, "one-component") bonding products that is clearly and accurately marketed as being for limited bonding purposes. To its credit, Vivadent does not claim that Excite can be used for such things as amalgam bonding and porcelain repairs because it does not come with additional components necessary for those uses. Excite is remarkably fast to apply, covers the tooth surface in only one application, and has a bond strength to dentin similar to that of the other nanofilled bonding agent currently on the market (Prime & Bond NT, Dentsply/Caulk). It clearly enhances infection control because of its innovative unit-dose packaging. The application process is very easy to understand because Excite is provided with one of the few graphics-only instruction cards. Clinicians who dislike the thicker viscosity of many currently-marketed bonding agents will appreciate Excite's thinner viscosity. For the simple bonding procedures for which it is intended, **Excite** is rated **Recommended** for use by the federal dental services.

(Col Charlton)

60-09 Calibra Esthetic Resin Cement**(Project 99-36)**

Calibra is a two-paste, dual-cured cement that is used in conjunction with Prime & Bond NT Dual Cure dentin bonding agent for luting indirect restorations. The Calibra Complete System is packaged in two plastic tackle-box type cases. The first contains the cement and includes five syringes of base paste in shades Transparent, Light, Medium, Dark, and Opaque as well as one syringe each of two viscosities (Regular, High) of unpigmented catalyst paste. The Prime & Bond NT bonding agent and phosphoric acid etchant are included in the same case. The second plastic case contains five syringes of the corresponding shades of try-in pastes and a syringe of silane solution. Calibra is recommended for the luting of all-metal, all-ceramic, all-resin, and porcelain-fused-to-metal restorations as well as posts and resin-bonded fixed partial dentures. It is contraindicated for use as a liner/base, core build-up material, or restorative material. In addition to detailed written instructions, a graphics-containing instruction card booklet is also provided.

Manufacturer:

L.D. Caulk Division
Dentsply International, Inc.

P.O. Box 359
Milford, DE 19963-0359
(800) 532-2855
(302) 422-4511
(800) 788-4110 FAX
www.caulk.com

Suggested Retail Price:

\$367.55 Calibra Esthetic Resin Cement Complete System (product number 607060)
-five 2-g syringes of base paste, (shades Transparent, Light, Medium, Dark, and Opaque)
-two 2-g syringes of catalyst paste (regular and high viscosity)
-one 4.5-mL bottle of Prime & Bond NT
-one 4.5-mL bottle of Prime & Bond NT Activator
-one 3-mL syringes of Tooth Conditioner Gel
-accessories

Government Price:

\$202.25 Calibra Esthetic Resin Cement Complete System (product number and contents as listed above)

ADVANTAGES:

- + Working time is long enough so users do not have to rush during mixing and placement.
- + Relatively short setting time minimizes post-cementation chair time.
- + Acceptable film thickness.
- + Adequately radiopaque; easy to detect on radiographs.
- + Shades were adequate for majority of cases treated during evaluation.
- + Provided with try-in pastes for all five shades.
- + Pastes are easy to mix.
- + Supplied with silane solution and a bonding agent that is fast and easy to use.
- + Very easy to clean excess cement from margins.
- + Superb graphics instruction booklet.
- + No post-treatment sensitivity reported.
- + Expiration dates and lot numbers are provided for all items in kit.
- + Material Safety Data Sheet (MSDS) included in kit.

DISADVANTAGES:

- Does not include hydrofluoric acid for porcelain/ceramic etching.
- One evaluator felt that some of the shades were too similar in appearance.
- More expensive than other popular resin cements (eg, RelyX ARC [3M], Variolink 2 [Vivadent]).

SUMMARY AND CONCLUSIONS:

Calibra Adhesive Resin Cement performed well in the laboratory: it had a thin film thickness, appropriate working and setting times, and was adequately radiopaque. Clinical evaluators found it easy to mix and appreciated its excellent instruction booklet. Esthetically, the cement performed well, in part because it has five shades from which to choose and includes try-in pastes. Most necessary components are provided with the exception of a hydrofluoric acid etchant, which some users may wish to have. The product is more expensive than some other popular resin cements. **Calibra Adhesive Resin Cement** is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

60-10 Optimix

(Project 99-45)

The Optimix is Kerr's newest amalgamator that is designed to be the successor to the popular Automix. It

is manufactured and serviced by Demetron, a division of Kerr Corporation. The Optimix still retains the microprocessor control and liquid crystal display (LCD) like those with the Automix but Kerr cites that the Optimix is completely programmable, eliminating the need for the computer credit cards that were required with the Automix. All programs can be accessed or modified through a touchpad on the Optimix front. The Optimix features an improved capsule holder that is said to be compatible with all amalgam and glass-ionomer capsules. The capsule holder is part of a spring-loaded horizontal mixing arm into which capsules can be placed and removed with one hand. The mixing chamber is totally enclosed with a safety cutoff that stops mixing in the event the chamber hood is opened during trituration. Other features include the ability to customize and save modified trituration programs, multi-lingual capabilities, increased frequency ranges (3000-4800 cycles per minute), and laminated instruction cards for quick reference. The Optimix is compatible with 115-120V 50/60Hz AC power, measures 5" H x 10" L x 7 5/8" D, and weighs 8.25 pounds.

Manufacturer:

Sybron Dental Specialties
Kerr/Demetron
1717 West Collins Avenue
Orange, CA 92867
(800) 537-7123
(714) 516-7400
(714) 516-7633 FAX
www.kerrdental.com

Suggested Retail Price:

\$935.00 Optimix (Item number 910060)

Government Price:

\$441.45 Optimix (Item number same as above)

ADVANTAGES:

- + Produces consistent mixes of materials.
- + Pre-programming makes it easy to set mixing frequency and time.
- + Quietest triturator that DIS has evaluated.
- + Capsule placement and removal can be accomplished with one hand.
- + Compatible with all tested capsule designs.
- + Passed all electrical safety requirements.
- + Mixing times and frequencies are accurate.
- + No undue vibration during operation.
- + Comparable in price to other triturators.
- + Securely packed for shipment.
- + Safety switch prevents mixing while mixing chamber lid is raised.
- + Internal circuitry clearly labeled with quick-connect electrical connections.
- + Multi-lingual LCD readout.

DISADVANTAGES:

- Programming times and frequencies for a wide variety of materials are not currently available.

SUMMARY AND CONCLUSIONS:

The Optimix amalgamator features pre-set programming of mixing frequencies and times that has replaced the computerized input cards that were required for the unit's predecessor, the Automix. The Optimix is well designed, features high-quality construction, and passed all electrical safety tests. The unit features a sealed, brushless motor with clearly labeled internal electrical components that should facilitate any needed maintenance. The Optimix did not vibrate excessively during operation, displayed accurate timing and frequency control, was compatible with all capsule designs tested, and was the quietest triturator that DIS has evaluated. Clinical users confirmed that the Optimix produced consistent mixes regardless of the materials that were used and capsules were easy to place and remove with one hand.

Although evaluators expressed a desire for more programming for non-Kerr capsules, no users reported any problems achieving clinically satisfactory preparation of materials. The unit is comparable in price to that of other triturators. A majority of the evaluators rated the Optimix as Excellent and all users recommended it be purchased for use in their respective clinics. The **Optimix** is rated **Recommended** for use by the federal dental services.

(Lt Col Roberts)

60-11 Variable Intensity Polymerizer Light Curing Unit (VIP) (Project 99-14)

BISCO Dental Products has recently introduced the Variable Intensity Polymerizer Light Curing Unit (VIP). The VIP is a microprocessor-controlled, visible light curing unit that has been designed and marketed for the pulse-delay cure technique for resin composites. The pulse-delay polymerization method is touted to reduce composite polymerization stress by first curing the composite for a short duration at low intensity (eg, three seconds at 100-200 mW/cm²). Three minutes are then allowed to pass, during which time the composite is finished. The final cure is accomplished by exposing the resin to the light for 30 seconds at 500-600 mW/cm². BISCO provides pulse-cure mode settings for a variety of conventional and posterior packable resin composites. Programs, curing intensity, and curing time may be set using either the handpiece or the base unit. Two pulse-cure settings can be programmed, but the VIP may also be used in a conventional continuous curing mode with irradiance settings from 100 to 600 mW/cm² in 100mW increments. Curing time can be set to 2, 3, 4, 5, 10, 20, and 30 seconds, but the light can also be set in a continuous curing mode up to 255 seconds.

Both eight- and eleven-millimeter curing tips are available, and the manufacturer states that the VIP is compatible with Demetron Tips. This unit also features a built-in radiometer that is said to automatically calibrate the power of the VIP to ensure the intensity output is accurate. The VIP is purported to be the first VLC unit that offers advanced diagnostics, a feature that may help users determine the cause of malfunctions in its operation. The advanced diagnostics also provide information on bulb life usage history, bulb filament status, and "headroom" reading (ie, the difference between maximum bulb output and present calibrated output -- said to be a measure of the unit's reserve power). BISCO claims that the VIP operates at less than full capacity, which is purported to reduce wear and extend the service life of the bulb and other electrical components.

Manufacturer:

BISCO, Inc.
1100 W. Irving Park Road
Schaumburg, IL 60193
(800) 247-3368
(847) 534-6000
(847) 534-6111 FAX
www.bisco.com

Retail Price:

\$995.00 VIP Curing Unit (product number V-10120K)
-- 1 VIP base unit and handpiece
-- 1 11-mm, 55-degree, curved fiber-optic light probe
-- 1 protective light shield
-- 1 (12V/75W) replacement lamp
-- 1 detachable power cord
-- 2 replaceable fuses (250V, T 1.6 A)
-- 1 operators manual

Government Price:

\$847.75 (Same items as above)

ADVANTAGES:

- + Designed to be utilized with the pulse-delay polymerization method.
- + Offers diagnostic features not seen with other VLC units.
- + Irradiance settings can be adjusted from 100 to 600 mW/cm².
- + Self-calibration feature refines irradiance output.
- + Has a wide range of timer settings.
- + Built-in digital readout radiometer.
- + LCD display.
- + Ergonomically-designed handpiece.
- + Sterilizable curing tips.
- + Internal voltage regulator.
- + Light shield is easily positioned.
- + Designed for easy bulb change or filter inspection.
- + 360-degree-swiveling curing tips.
- + Cooling fan operation is proportional to bulb usage.
- + Quiet cooling fan.
- + Easily cleaned or barrier protected.
- + Passed all electrical safety standard testing.

DISADVANTAGES:

- Use too complicated for the usual federal services multi-user environment.
- Best suited for single-clinician use.
- Provides only minimally adequate irradiance with 13-mm curing tip at full power.
- Built-in radiometer is inaccurate when used with tips having a diameter smaller or larger than 11 mm.
- For average clinical use, unit's additional diagnostic features do not justify its relatively high cost.

SUMMARY AND CONCLUSIONS:

The VIP curing unit is marketed to provide clinical flexibility to match newer resin composite curing techniques, most notably the pulse-delay polymerization method. The VIP is a well-designed, ergonomic unit that is easily positioned to reach all areas of the oral cavity. The unit offers advanced diagnostic features and self-calibration that are not usually seen with the typical VLC unit. Testing found that the VIP's irradiance values were acceptable with the 11-mm tip, however the 13-mm tip did not produce irradiance values high enough to adequately cure microfilled resin composites. The internal radiometer gave accurate readings for the 11-mm tip but produced erroneous readings for tips that were larger or smaller. All evaluators rated the VIP as "Good," but none recommended the unit be purchased for general use in their respective clinics due to its operational complexity. Because of its complexity, a majority of users thought that the VIP is best for a clinical setting where it is used consistently by a single operator. Although the diagnostic features of this unit were appreciated, all evaluators thought that for routine clinical use the additional features of this product do not justify its relatively high cost. The **VIP** is rated **Acceptable** for use by the federal dental services.

(Lt Col Roberts)

60-12 Endo Analyzer 8005**(Project 99-41)**

The Endo Analyzer 8005 is both an endodontic pulp vitality tester and electronic apex locator from Analytic Sybron Dental Specialties. The company claims that it provides pulp testing that is pain-free and has consistent, microprocessor control. The apex locator function is advertised to accurately locate the apical foramen. The unit can be used in the presence of sodium hypochlorite, anesthetic solutions, alcohol, EDTA, RC Prep, blood, pus, and other liquids as well as in the presence of necrotic tissue. However, the best clinical results are said to be achieved when the unit is used in combination with sodium hypochlorite. The Endo Analyzer 8005 features two self-calibrating apex location programs that utilize five frequencies with graphical display of the apical foramen in 0.1-mm increments as well as an audible chime when the foramen is reached.

Manufacturer:

Analytic Sybron Dental Specialties
1717 West Collins Avenue
Orange, CA 92867
(800) 346-3636
(714) 516-7979
(714) 516-7911 FAX
www.analytic-endodontics.com

Suggested Retail Price:

\$1295.00 Endo Analyzer Model 8005 (part number 973-0237) includes

- Connecting Lead
- Standard Vitality Scanner Probe
- Mini Crown Vitality Scanning Probe
- Apex Finder Bifurcated Probe
- Apex Finder File Clip
- Lip Clip

Government Price:

\$841.75 Endo Analyzer Model 8005 (part number and contents as listed above)

ADVANTAGES:

- + Combination of pulp vitality tester and apex locator in one unit.
- + Extremely easy to use.
- + Auto on and off feature.
- + Pulp vitality tester found to be consistently accurate.
- + Pulp vitality features are adjustable.
- + Mini-probe allows reliable pulp testing of teeth with full-coverage restorations.
- + Reported to be pain-free to patients.
- + Apex locator function reported to be accurate under appropriate conditions.
- + Automatically calibrates which reduces time.
- + Apex location feature can be set to read short of anatomical apex, if desired.
- + Facilitates working length determination in difficult cases.
- + Lightweight and portable.
- + Large, easy-to-read display.
- + Seamless construction design that facilitates cleaning and disinfection.
- + Batteries are easy to change.

DISADVANTAGES:

- Unit is extremely sensitive near the apex and difficult to zero out.
- Hypochlorite found to be only canal irrigant that produced reliable readings.
- Bifurcated probe for quick-touch reading was unreliable.
- Wire exiting apex finder clip may have a weak point that could lead to early failure.

SUMMARY AND CONCLUSIONS:

The Endo Analyzer 8005 combines both an electronic apex locator and electric pulp vitality tester in one compact unit. The evaluator found it to be extremely easy to use and the pulp-testing feature provided consistent, accurate, and pain-free operation. The electronic apex locator features both audible and graphical displays of canal length and was judged to be accurate and easy-to-use. An added feature is that it can be set to read slightly short of the apical foramen if desired. On the negative side, the unit was found to be extremely sensitive near the apex and was difficult to zero out at the apical foramen. Also, the wire lead from apex finder clip was found to have a weak junction, which may lead to early breakdown. Because of its accuracy and ease of use, the evaluator recommended the Endo Analyzer 8005 be purchased for his clinic. The **Endo Analyzer 8005** is rated **Recommended** for use by the federal dental services.

(Lt Col Roberts)

60-13 Aquasil Altus Automated Cartridge Delivery System (Project 99-51)

The Aquasil Altus Automated Cartridge Delivery System is a hand-held, electrically-powered device for mixing and dispensing impression material. The unit, which looks somewhat like a traditional automix dispenser gun, is designed to accept Dentsply's 50-mL cartridges of Aquasil, an addition silicone. Aquasil is available for the Altus dispenser in three introductory kits: monophasic and light viscosity, rigid and light viscosity (regular set), and rigid and light viscosity (fast set). Only the monophasic and light-viscosity kit was used in this evaluation. It is important to note that not all manufacturers' cartridges fit in the unit, so it is important to determine compatibility with your brand of impression material should you decide to use something other than Aquasil.

To use the dispenser gun, it is opened along a hinged joint, the impression material cartridge is inserted, and the unit is snapped shut. After a tip is placed on the cartridge, the gun is activated by depressing a button on the front of the handle. The motor speed is variable based on how far the button is depressed. After the button is released, the motor reverses very briefly to prevent unnecessary impression material from being extruded from the tip. The unit is approximately the size of a standard automix gun, weighs 1.5 pounds, and has a 4-foot-long cord that can easily be stretched to 8 feet. It comes with a three-year full replacement warranty.

Manufacturer:

L.D. Caulk Division
Dentsply International, Inc.
P.O. Box 359
Milford, DE 19963-0359
(800) 532-2855
(302) 422-4511
(800) 788-4110 FAX
www.caulk.com

Suggested Retail Price:

\$1,487.70 Aquasil Altus Monophasic and LV Introductory System (item number 678399)
 -1 Aquasil Altus Automated Cartridge Dispenser
 -1 Aquasil 50-mL Manual Dispenser
 -2 bottles of Dentsply/Caulk Tray Adhesive
 -25 intraoral tips
 -78 mixing tips
 -24 Cartridges (50-mL ea) of Aquasil Monophasic Material
 -6 Cartridges (50-mL ea) of Aquasil Light-Viscosity Material

Government Price:

\$967.00 Item number and contents as listed above

ADVANTAGES:

- + Produces and dispenses well-mixed impression materials.
- + Makes it much easier to mix and dispense heavy-body impression materials than using traditional automix gun.
- + Cord is long enough for easy mobility in the treatment room.
- + Is quiet during use.
- + Unit automatically prevents unnecessary material from being extruded at the end of the mixing time.
- + Not adversely affected by the disinfecting solutions tested.
- + Passed all electrical safety test requirements.

DISADVANTAGES:

- Expensive; 16 times as expensive as standard automix gun.

- Is not compatible with every manufacturers impression material cartridges.
- Not faster at mixing and dispensing than traditional automix guns.
- Variable-speed capability judged to be of little practical use.
- Some users may find the unit too heavy.
- Laminated, user-friendly instruction card not provided.

SUMMARY AND CONCLUSIONS:

The Aquasil Altus Automated Cartridge Delivery System mixes impression materials thoroughly and makes it much easier for assistants to mix and dispense heavy-body materials. The machine is quiet and easy to use, however some users found it heavier than they would have liked. It was also judged by some to be difficult to open when cartridges needed to be replaced. The unit's brief reverse operation when the trigger button is released prevents excess, unnecessary mixed material from being expressed. Its variable speed, however, was judged to be of little practical benefit in controlling the rate with which the unit mixed materials. The primary disadvantage of this product is its high cost. Coupled with the few advantages it provides compared to traditional, manually-operated automix guns, it is hard to justify its purchase by federal dental clinics. The **Aquasil Altus** is rated **Marginal** for use by the federal dental services.

(Col Charlton)

60-14 D/Sense 2 Dual Action Liquid Dentin Desensitizer (Project 99-55)

D/Sense 2 is a clear liquid supplied in two bottles that is recommended for the treatment of dentin hypersensitivity. According to the manufacturer, ideal treatment cases include sensitivity from cervical lesions, bleaching, and periodontal surgery. The product may be used under most common restorative materials. Centrix claims that it is particularly well suited for application in cases where sensitive dentin is adjacent to soft tissue because D/Sense 2 contains no HEMA (hydroxyethyl methacrylate), glutaraldehyde, or chemicals that could cause soft tissue irritation. The product is used by applying the solution from bottle 1 (two soluble salts of calcium and strontium) with a brush for 10 seconds followed by application of the solution from bottle 2 (two soluble potassium salts) for 10 seconds. D/Sense 2 purportedly works by occluding dentin tubules with four insoluble salts and by the depolarizing action of a potassium salt. Centrix claims the product provides relief for a minimum of four months.

Manufacturer:

Centrix, Inc.
 770 River Road
 Shelton, CT 06484-5458
 (203) 929-5582
 (800) 235-5862
 (203) 929-6804 FAX
 www.centrixdental.com

Suggested Retail Price:

\$166.65 Dual Action Liquid Dentin Desensitizer (item number 310103) contains:
 -one 7-mL bottle of Step 1 solution
 -one 7-mL bottle of Step 2 solution
 -72 BendaBrush applicator brushes
 -36 BondLogic® plastic trays

Government Price:

\$149.95 Dual Action Liquid Dentin Desensitizer (item number and contents as listed above)

ADVANTAGES:

- + Reported to be very effective by clinical evaluators.
- + Most users reported that patients experienced complete relief.

- + Effects took place immediately or within minutes of treatment.
- + Generally was effective for several months.
- + Easy and fast to apply.
- + Instructions are clear and concise.
- + Solutions react visually during application which assists clinicians in determining proper placement.
- + Provided with a Material Safety Data Sheet (MSDS).

DISADVANTAGES:

- Some patients reported sensitivity during application.
- BondLogic[®] plastic dispensing trays are large and wasteful.
- Some users reported confusion about the products expiration date.

SUMMARY AND CONCLUSIONS:

D/Sense 2 is a two-solution desensitizing product that evaluators reported to be easy and fast to apply. The product was extremely effective, with over 90% of treated patients reporting relief that was often immediate and complete. Generally, the relief lasted several months. Product instructions are clear, concise, and include a Material Safety Data Sheet. Applicator brushes are provided that are color-coded to the bottles which prevents confusion during application. The packaging is somewhat wasteful and the dispensing trays are too large and complicated. For the treatment of commonly-encountered dental sensitivity from cervical lesions, bleaching, and periodontal surgery, **D/Sense 2** is rated **Recommended** for use by the federal dental services.

(Col Charlton)

60-15 Determination of the Minimum Irradiance Required for Adequate Polymerization of a Hybrid and Microfill Composite (Project 98-32)

Visible light-curing units are used extensively in the practice of dentistry. They are commonly used to polymerize light-sensitive restorative materials such as resin composites, resin-modified glass ionomers, polyacid-modified resin composites, and pit and fissure sealants. In addition, visible light-curing units are required for most bonding systems, an increasing number of bases and liners, various luting agents, and some provisional restorative materials. Adequate polymerization of these materials depends on the light source intensity (irradiance), wavelength, and curing time. Unless all three are adequate, the materials will incompletely polymerize and exhibit poor physical properties that may lead to early failure.^{1,2}

Research has shown that an irradiance of from 300 mW/cm² to 400 mW/cm² is necessary to adequately cure a 2-mm-thick resin composite specimen.^{1,3} This assumes that the correct wavelength of light (390 nm to 520 nm) is used as well as a minimum 40-second curing time. Irradiance values less than 300 mW/cm² can be compensated for by longer exposure times, however light sources with irradiance values less than 233mW/cm² should not be used.¹ Ideally, for 1-mm-thick resin composite increments, a 60-second cure using a light irradiance of at least 400 mW/cm² is recommended.¹

The degree to which a resin composite can be polymerized using a visible light-curing unit is affected by characteristics inherent to the particular material being polymerized. For example, previous investigations have concluded that microfill resin composites require greater irradiance than hybrids for a adequate polymerization.^{4,5}

Minimal irradiance values previously cited have either been unsupported by scientific studies or have been nonspecific with regard to the particular type of resin composite being polymerized. The purpose of this study was to determine the minimal irradiance required to adequately polymerize a 2-mm increment of a hybrid and a microfill resin composite.

For this study, depth of cure test specimens were made using a hybrid resin composite (Z-100, 3M) and a microfill resin composite (Silux Plus, 3M). The specimens were exposed to either a 40- or 60-second exposure using a light curing unit. One day later, the specimens were tested for hardness and percentage

depth of cure calculations were made.

Results indicated a substantial difference between the minimum irradiance required to adequately polymerize the hybrid resin composite, Z-100, and the microfill, Silux Plus (see following table).

Table. Minimum irradiance required for adequate polymerization of 2-mm-thick increment.

	Z100	Silux Plus
40-second exposure	260 mW/cm ²	543 mW/cm ²
60-second exposure	185 mW/cm ²	449 mW/cm ²

SUMMARY AND CONCLUSIONS:

The results of this study indicate that there is a substantial difference between the minimum irradiance required to adequately polymerize the hybrid resin composite, Z-100, and the microfill, Silux Plus. The generally accepted value of 300 mW/cm² appears to be adequate for proper polymerization of the hybrid resin composite used in this study. However, the microfill resin composite was found to require twice the irradiance as the hybrid for adequate polymerization. Higher minimum irradiance values need to be established and recommended for microfill resin composites.

(Col Leonard, Col Charlton)

References

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4. Rueggeberg FA, Caughman WF, Curtis JW, Davis HC. A predictive model for the polymerization of photo-activated resin composites. *Int J Prosthodont* 1994;7:159-166.
5. Atmadja G, Bryant RW. Some factors influencing the depth of cure of visible light-activated composite resins. *Aust Dent J* 1990;35:213-218.

60-16 Synopsis of Endodontic Pulp Vitality Testers

(Project 99-32)

Endodontic pulp vitality testers are a useful diagnostic adjunct for both general dentists and endodontists. Some manufacturers have marketed new units since the the last DIS synopsis (1993). DIS was able to obtain information for four different endodontic pulp vitality testers from three manufacturers who replied to our request for information. As can be seen in Attachment 1, federal facilities have a range of choices of pulp testers.

(Lt Col Roberts)

60-17 Synopsis of Mercury Spill Kits

(Project 99-44)

The potential health and environmental effects of metallic mercury have received increased attention in the last few years. As part of local mercury hygiene programs, federal dental facilities may wish to purchase a mercury clean-up kit to be prepared in the event of a mercury spill. A synopsis of available mercury spill kits will assist federal facilities in choosing a kit that can fit local clinic needs. DIS was able to obtain data concerning fifteen different mercury spill kits from six manufacturers who replied to a DIS

request for information. As is apparent from the information, federal facilities have many choices of mercury spill kits that should fit requirements that they may have. This information has been summarized in table form at to assist federal dental facilities in making educated choices when purchasing these kits (see Attachment 2).

(Lt Col Roberts)

60-18 Vacu-Spray EX

(Project 00-08)

The Vacu-Spray EX is an evacuation system that installs onto an existing air/water syringe tip. The product consists of a metal air/water syringe tip (one inch longer than a conventional tip) that is surrounded by a disposable, straw-like suction tip. This combination is inserted into any conventional air/water syringe handle and connects to the high-volume evacuation system via a sterilizable double-elbow connector and six feet of tubing. The product provides air, water, and suction in one device. The manufacturer claims it simplifies procedures when the provider is without an assistant.

Manufacturer:

Dynamic Dental Innovations
627 SW Topeka Blvd.
Topeka, KS 66603
(800) 418-2278
(785) 234-3660
(785) 838-9435 FAX

Suggested Retail/Government Price:

\$135.00 Vacu-Spray EX Kit
-160 disposable Vacu-Spray EX tips
-6 sterilizable double-elbow connectors
-6 EX metal air/water syringe tips
-6 feet of Vacu-Spray tubing

ADVANTAGES:

- + Innovative concept.
- + Simplifies unassisted procedures.
- + Provides ability to rinse and suction using only one-hand.
- + Improves work efficiency.
- + Fits any standard unit and air/water syringe.
- + No tools needed for installation.
- + Disposable tips.
- + Fully sterilizable parts.
- + Can be barrier protected.

DISADVANTAGES:

- Bulky.
- Inadequate suction for complete fluid removal.
- Poor maneuverability.
- Straw is too short and not durable enough.

SUMMARY AND CONCLUSIONS:

The Vacu-Spray performed adequately in the clinical setting for providers working without an assistant (e.g., prophylaxis technicians). The clinical evaluators found the instructions to be user-friendly and appreciated the ability to rinse and suction using one hand. The evaluators felt this product could be best

utilized during the placement of sealants and for clean-up of blood, debris and prophylaxis paste at the conclusion of an oral prophylaxis. The main drawback to the Vacu-Spray was poor maneuverability due to the location of the evacuation tubing. The **Vacu-Spray EX** is rated **Acceptable** for use by the federal dental services.

(Col Bartoloni)

INFECTION CONTROL

60-19 DentaPure DP40 Cartridge

(Project 00-05)

The DentaPure DP40 cartridge is a point-of-source, straw-like filter that retrofits via quick-connect fittings to the existing water pickup tube in the bottle of a dental unit's independent water system. The device purportedly provides purification of water within the dental unit by filtration and by eluting from 2 to 6 parts per million of a germicide (iodine). The manufacturer claims the device removes dental unit biofilm, retards biofilm growth, and reliably provides water purity that exceeds the ADA recommendation for water quality. Also, the manufacturer (MRLB International) purports that the product maintains water purity for 30 liters of water. MRLB International emphasizes that the DP40 eliminates the need for dental unit decontamination and flushing protocols.

Manufacturer:

MRLB International, Inc.
2450 College Way
Fergus Falls, MN 56537
(800) 972-3543
(218) 739-2222
(218) 736-3241 FAX

Suggested Retail Price:

\$79.95 One (1) DentaPure DP40 cartridge

Government Price:

\$52.00 One (1) DentaPure DP40 cartridge

ADVANTAGES:

- + Produced water that met current ADA recommendations.
- + No need for waterline disinfection.
- + Uses simple technique that minimizes technician compliance.
- + Less likely to damage dental unit than bleach.
- + Can be installed on any independent water reservoir.
- + Minimal installation/replacement requirements.
- + Installation kit included.
- + User-friendly instructions.
- + Minimal maintenance.
- + Used cartridge can be discarded as ordinary waste.

DISADVANTAGES:

- More expensive than diluted bleach.
- Flushing is recommended to maintain iodine levels at beginning of day and between patients.
- Manufacturer recommends waterlines be cleaned prior to initial installation.
- Manufacturer recommends cartridge be replaced after every 30 liters are treated.

SUMMARY AND CONCLUSIONS:

The DentaPure DP40 was judged to be easy to install and use. During the four-week test period, all water samples tested met the ADA goal for microbiological quality. This product eliminates the need for waterline disinfection and reduces the likelihood of damage to the dental unit as compared to diluted bleach. The main complaint noted was the cost compared to that of diluted bleach used as a germicide for waterline disinfection. This is, in large part, due to the need to replace the filter every 30 liters of treated water. The **DentaPure DP40 cartridge** is rated **Acceptable** for use by the federal dental services. (Col Bartoloni)

60-20 UltraKleen**(Project 00-06)**

UltraKleen is an alkaline peroxide-based powder that is used to clean waterlines in dental units. The product contains hydrolytic and oxidizing agents which, the manufacturer (Sterilex) claims, penetrate and remove biofilms and related deposits. To use UltraKleen, the powder is mixed with hot water and the resulting solution is drawn through the dental unit and left in the waterlines over night. Sterilex recommends a once-weekly treatment. Sterilex also recommends that when a unit is first treated with UltraKleen, it should be used for three consecutive nights beginning on a Monday. UltraKleen contains a pink dye for easy identification when treating the waterlines. Sterilex claims the product is non-corrosive to dental equipment. UltraKleen has recently been recommended by A-dec for use for treating their dental units.

Manufacturer:

Sterilex Corporation
7-I Gwynns Mill Court
Owings Mills, MD 21117
(800) 511-1659
(410) 581-8860
(410) 581-8864 FAX
www.sterilex.com

Suggested Retail Price:

\$33.00 One (1) carton of 20 packets

Government Price:

\$19.80 One (1) carton of 20 packets

ADVANTAGES:

- + Produced water that met ADA water quality requirements.
- + Has been recommended for use by A-dec.
- + Easy-to-use.
- + After initial treatment, only requires once-a-week application.
- + Use of dye indicator simplifies application.
- + Minimal storage requirements.
- + Unused diluted solution can be discharged to a sanitary sewer.
- + Can be used with any independent water system.

DISADVANTAGES:

- More expensive than diluted bleach.
- Requires use of personal protective equipment (PPE) when mixing.
- Manufacturer recommends three consecutive overnight sessions for initial treatment.
- Requires thorough flushing after treatment.

SUMMARY AND CONCLUSIONS:

UltraKleen was rated **Excellent** by the clinical user for ease and simplicity of use. To date, UltraKleen is one of two products that has been recommended by the A-dec Company for use in their independent water systems. During our four-week test period, all water samples met the ADA goal for water quality. The product's main disadvantage was its relatively high cost compared to diluted bleach. **UltraKleen** is rated **Acceptable** for use by the federal dental services.

(Col Bartoloni)

60-21 Dentacide**(Project 00-07)**

Dentacide is a dental unit waterline cleaner that uses free iodine as the germicide. The product is a ready-to-use solution requiring no mixing or dilution, and it can be used with any independent water system. Each treatment requires approximately 2 ounces of solution which is added to the empty water bottle of an independent system. After being drawn into the dental unit waterlines, it is allowed to remain overnight. The solution is then flushed out at the beginning of the next duty day. The manufacturer (Frio Technologies) recommends daily application to achieve the ADA goal for microbiological quality of dental treatment water. Frio Technologies claims that Dentacide is non-toxic, non-irritating, non-sensitizing, environmentally friendly, and safe for dental equipment.

Manufacturer:

Frio Technologies Inc.
500 Sandau, #200
San Antonio, TX 78216
(210) 308-0636
(210) 308-6196 FAX

Suggested Retail/Government Price:

\$149.88 One (1) case of Dentacide (twelve 16-ounce bottles)

ADVANTAGES:

- + Produced water that met ADA water quality recommendations.
- + Less likely to damage dental unit than bleach.
- + No mixing or dilution required.
- + Utilizes minimal solution for waterline treatment.
- + Can be used with any type independent water reservoir.
- + Color of solution makes it easy to see.
- + User-friendly instructions.

DISADVANTAGES:

- More expensive than diluted bleach.
- Manufacturer recommends nightly application.
- Requires adequate amount of shelf storage space.

SUMMARY AND CONCLUSIONS:

Dentacide was rated **Excellent** for all its handling features including ease of placement and flushing. The product requires no mixing and utilizes approximately two ounces of solution to treat a dental unit. During the four-week test period, all water samples met the ADA goal for microbiological quality. The main shortcomings are the need for nightly application and increased cost as compared to diluted bleach for waterline disinfection. **Dentacide** is rated **Acceptable** for use by the federal dental services.

(Col Bartoloni)

SYNOPSIS OF ENDODONTIC PULP VITALITY TESTERS

	VITALITY SCANNER	DIGITEST	GENTLE PULSE	VITALITY SCANNER 2005
Manufacturer	Kerr/Sybron Dental 1717 W. Collins Ave. Orange, CA 92867-9880 (800) 537-7187 ext 7024 (714) 516-7400 (800) 537-7345 FAX www.sybrondental.com	Parkell 155 Schmitt Blvd. P.O. Box 376 Farmington NY 11735 (800) 243-7446 (516) 249-1134 (516) 249-1242 FAX Parkell@pb.net	Parkell 155 Schmitt Blvd. P.O. Box 376 Farmington NY 11735 (800) 243-7446 (516) 249-1134 (516) 249-1242 FAX Parkell@pb.net	Analytic Endodontics Analytic Sybron Dental Specialties 1717 W. Collins Ave. Orange, CA 92867-9880 (800) 346-363 (714) 516-7979 (714) 516-7911 FAX www.Analytic-Endodontics.com
Dimensions: H x W x L (inches)	2¼ x 4¼ x 7¾	7 x 1¼ x ¾	7 x 1¼ x ¾	4½ x 5½ x 3½
Retail Price	\$600	\$190	\$99.95	\$699
Government Price	\$342.95	\$190	\$99.95	Upon request
Electrical Certification	Yes (not specified)	CE BN46001	CE BN46001	IEC 601-1
Batteries Required?	4 AA (included)	1 - 9V (included)	1 9V (included)	6 AA (included)
Low Battery Indicator?	Yes	Yes	Yes	Yes
Microprocessor Controlled?	Yes	NA	No	Yes
Readouts	LCD/LED	LED	LED	LCD/LED
Rate Adjustment	Automatic	Automatic	Manual	Automatic
Number of Probes Included	2	2	2	2
Probes Autoclavable?	Yes	Yes	Yes	Yes
Usable While Wearing Gloves?	Yes	Yes	Yes	Yes
Warranty	1 year from date of purchase	5 years	5 years	1 year

All data supplied by manufacturer; NA = not available

SYNOPSIS OF MERCURY SPILL KITS

Kit Name	MERCURY MAGNET	EZ CLEANS MERCURY SPILL KIT	KIT330 MERCURY SPILL KIT	MIS-1	MERCONKIT I
Manufacturer	Lamp Recyclers of Louisiana, Inc.	Safetec of America	New Pig, Inc.	Cartier Chemicals, Ltd.	EPS Chemicals, Inc.
Contents	MSDS, safety goggles, 700 gm Mercury Magnet powder, plastic scoop, magnet pickup tool, 2 resealable plastic bags, nitrile gloves, suction bottle, scouring pad, small brush, telescopic magnet, shipping/storage bucket	High-risk gloves, safety shield, 2 oz Green Z pouch, 4 oz absorbent activator bottle, pick-up scooper/scrapper, wiper towel, zip lock disposal bag, disposal bag with closure, ID label, instructions	6 pairs of latex gloves, safety goggles, 6 scoops/spatulas, 1 roll 40 butyl rubber tape, 7 zip lock bags, 6 premoistened wipes, 4 oz hand cleaner, carrying case, vacuum hand pump, 6 collection vials	750 gm VYTAC MIS mercury neutralizer, 180 gm VYTAC mercury vapor suppressant, 2 pairs of chemical resistant gloves, 3 waste collection bags, collector pan with brush, spray bottle, instructions	MERCONSPRAY, MERCONvap, mercury aspirator, MERCONtainer, MERCONwipes, safety goggles, nitrile gloves, resealable plastic bags, instructions, mercury waste labels
Approximate amount of Hg cleaned up	700 gm	Spill area of 3.5 ft ²	180 mL	540 gm/40 mL	1587 gm
Disposal Recommendations?	Send back to manufacturer	As per local/state regulations	Included	Based on local recommendations	Included
Retail Price	\$140	\$310.80 (case of 24 poly seal bags) \$275.40 (case of 12 hard carry cases)	\$198	\$52	\$208
Government Price	\$99	\$233.10 (case of 24 poly seal bags) \$206.55 (case of 12 hard carry cases)	\$179	\$34.29	\$208
Other information	Includes US DOT PG II kit for shipment				Wall-mountable steel case

SYNOPSIS OF MERCURY SPILL KITS (cont d)

Kit Name	MERCON KIT II	MERCONKIT III	MERCURY CLEANUP KIT	MINI MERCURY KIT	MERCURY SPILL KIT
Manufacturer	EPS Chemicals, Inc.	EPS Chemicals, Inc.	Lab Safety Supply	Lab Safety Supply	Lab Safety Supply
Contents	Same as MERCON KIT I but is in a portable container	MERCON aspirator, MERCON spray, MERCOnTainer, MERCOnvap liquid, safety goggles, nitrile gloves, disposal bags, instructions, mercury waste labels, case	Cinnasorb (activator and base), Resisorb aspirator, labeled recovery bottle, gloves, scoop, sponge, mixing cup, spatulas, polyethylene bag and label	Packet Hg Absorb powder, six Hg Absorb sponges, one pair gloves, one disposal bag	Packet Hg Absorb powder, two Hg Abosrb sponges, dustpan, scraper, protective glasses, gloves, disposal bag
Approximate amount of Hg cleaned up	1587 gm	680 gm	680 gm	30 gm	60 gm
Disposal Recommendations?	Included	Included	Included	Included	Included
Retail Price	\$175.25	\$123.60	\$173.70	\$14.85	\$79.80 per six kits
Government Price	\$175.25	\$123.60	\$173.70	\$14.85	\$79.80 per six kits
Other information	Portable cardboard case	Portable cardboard case			Personal-sized kits

SYNOPSIS OF MERCURY SPILL KITS (cont d)

Kit Name	ECONOMERCURY SPILL KIT	MERCURY CLEANUP SYSTEM	PORTABLE MERCURY SPILL KIT	MERCURY SPILL CONTROL STATION	MERCURY SPILL CONTROL STATION REFILL
Manufacturer	Lab Safety Supply	Lab Safety Supply	Lab Safety Supply	Lab Safety Supply	Lab Safety Supply
Contents	Hg Absorb jar, two Hg Absorb sponges, 500 gm Hg Absorb powder	500 gm Hg Absorb powder, four Hg Absorb jars, 250 gm Mercury indicator, 24 oz Mercury Vapor Adsorbent, scoop protective glasses, gloves, two disposal bags	500 gm Hg Absorb powder, four Hg Absorb sponges, protective glasses, gloves, disposal bag	One Hg Vac, 500 gm Hg Absorb powder, eight Hg Absorb sponges, eight recovery bags, safety glasses, gloves, scoop, wash bottle, instructions, metal case with mounting hardware	Replacement parts for Hg Vac, 500 gm Hg Absorb powder, eight Hg Absorb sponges, two disposable gloves, scoop
Approximate amount of Hg cleaned up	640 gm	645 gm	645 gm	665 gm	665 gm
Disposal Recommendations?	Included	Included	Included	Included	Included
Retail Price	\$22.55	\$108.40	\$32.35	\$155.70	\$38.10
Government Price	\$22.55	\$108.40	\$32.35	\$155.70	\$38.10
Other information		Polystyrene case	Plastic case with handle, may be wall mounted		

MANUFACTURER INFORMATION

MANUFACTURER	ADDRESS	TELEPHONE NUMBERS	WEB ADDRESS
Cartier Chemicals Ltd.	445-21 Avenue Lachine, Quebec, Canada H8S 3T8	(800) 361-9432 (514) 637-4631 (514) 637-8804 FAX	www.vytac.com
EPS Chemicals, Inc.	EPS/Ross Dental Unit 8 7551 Vantage Way Delta, BC, Canada V4G 1C9	(800) 663-8303 (604) 940-9938 (604) 946-3663 FAX	www.epsross.com
Lab Safety Supply	P.O. Box 1368 Janesville, WI 53547-1368	(800) 355-0783 (608) 754-2345 (608) 757-4925 FAX (800) 543-9910 FAX (800) 356-2501 safety tech line	www.labsafety.com
Lamp Recyclers of Louisiana, Inc.	46257 Morris Road P.O. Box 2962 Hammond, LA 70404-2962	(800) 309-9908 (504) 345-0022 (504) 345-4775 FAX	www.lamprecyclers.net
New Pig Corporation	1 Pork Ave Tipton, PA 16684	(800) 468-4647 (814) 684-0101 (814) 684-0644	www.newpig.com
Safetec of America	1055 East Delevan Avenue Buffalo, NY 14215-3145	(800) 456-7077 (716) 895-1822 (716) 895-2969 FAX	www.safetec.com